FARMED ANIMAL WELFARE LAW IN NEW ZEALAND:

INVESTIGATING THE GAP BETWEEN THE ANIMAL WELFARE ACT 1999 AND ITS DELEGATED LEGISLATION

FEBRUARY 2021

A REPORT PREPARED WITH THE SUPPORT OF THE NEW ZEALAND LAW FOUNDATION AND LUSH

NZALA.ORG

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FOREWORD

Kia ora koutou,

The High Court's recent decision in *New Zealand Animal Law Association v The Attorney-General* [2020] NZHC 3009 marks the first judicial examination of the legality of subordinate legislation under the Animal Welfare Act 1999. Concerns about inconsistencies between the Codes and their empowering Act have been raised by scholars and commentators since the Act's early days. Gaps between the Act and its Codes became more discernible after the Act was amended in 2015. That amendment also improved the legislative vehicle for dealing with inconsistencies. The High Court decision provides timely guidance as to how the Act treats these inconsistencies.

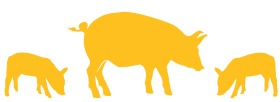
NZALA commissioned this report while preparing our High Court case, on the realisation that the farrowing crates inconsistency, although probably the most obvious example of gaps between the Act and the Codes, was certainly not the only one.

In commissioning this report, our aim was to create a helpful resource to assist the Minister, Associate Minister, NAWAC, and MPI, and inform their decision-making processes. The report's immediate target audience includes NAWAC's members as well as MPI's policy makers and advisors. It is also intended to constructively add to NZALA's ongoing dialogue with animal farming industry bodies. We hope it provides a rich roster of academic ideas and topics for animal law scholars and students who wish to further research the legality of the more controversial animal farming practices that are undertaken in New Zealand, or may be considered by the industry.

The research for this report was funded through a generous grant from the New Zealand Law Foundation – Te Manatū a Ture o Aotearoa – an independent charitable trust that provides grants for legal research, public education on legal matters, and legal training. The graphic design and publishing were made possible through a grant from Lush, a cosmetics company that supports projects focussed on animal welfare. We thank both of our funders and note that they played no role in the study conceptualisation, data acquisition, analysis or authorship of this report.

On behalf of NZALA I wish to thank the co-authors for their hard work and precious time. First and foremost the research lead and main contributor, Kari Schmidt, who directed the project from its early days to completion. We are deeply grateful to the panel of animal law experts - Danielle Duffield, Marcelo Rodriguez-Ferrere, and Professor Andrew Knight - who worked on the report on a pro bono basis. Finally, we acknowledge the special contribution to this report by industry representatives and thank them for their collegiality and open mindedness. We will keep working together to improve the lives and welfare of New Zealand animals.

Saar Cohen-Ronen
President
The New Zealand Animal Law Association
February 2021



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Thank you to Bridgette Toy-Cronin (Legal Issues Centre, University of Otago) for acting as our Methods Advisor - your guidance was invaluable and your thoughtful and comprehensive feedback has been greatly appreciated. We acknowledge and thank Bill Manning (Barrister) for his thorough review of the report. Thank you to our research assistants Jack Trevella and Rebecca Ong – your contributions to this report have been enormously helpful and it has been a pleasure to work with you both. We must also thank the New Zealand Animal Law Association (particularly Saar Cohen-Ronen, Neha Goyal, Jenny Gibbs and Cath Dearsley) for their support in undertaking this research; Tom Barraclough, for his assistance in the initial stages of conceptualising and proposing this research; our incredible volunteers for their contribution to the report including Manon Blackman, Hannah Waters, Sophie Watson, Sameela Ram, Lisa Whitney-Hollick, Marcella Cousens, Annabel Johnstone and Cath Dearsley; and Rhys Hamilton, Emily Hamilton and Neil Hamilton for facilitating a site visit to their dairy cattle farm.

Finally, we express our gratitude to all of the stakeholders who participated in this report. Your involvement has been crucial and enabled us to gain valuable insights into farmed animal welfare. Thank you to Shane Kelly of Ngāi Tahu Farming; Hans Kriek (formerly of Save Animals from Exploitation); Jenny Jago of DairyNZ; Kerry Gray and Julie Geange of Federated Farmers; Michael Brooks of Poultry Industry Association, the Egg Producers Federation and New Zealand Feed Manufacturers Association; Kate Littin of Ministry for Primary Industries; Mark Preece of New Zealand Salmon Farmers Association; Naya Brangenberg of Longbush Pork; and Jono Frew of Natural Performance Ltd.

LIST OF ABBREVIATIONS:

- Codes: Codes of Welfare
- EPF: Egg Producers Federation
- GS: Gait score
- MPI: Ministry for Primary Industries
- NAWAC: National Animal Welfare Advisory Committee
- NZALA: New Zealand Animal Law Association
- NZPork: New Zealand Pork
- PIANZ: Poultry Industry Association New Zealand
- Primary ITO: Primary Industry Training Organisation
- RNZSPCA: Royal New Zealand Society for the Prevention of Cruelty to Animals
- RRC: Regulations Review Committee
- SAFE: Save Animals From Exploitation
- The Act: The Animal Welfare Act 1999
- The Amendment Act 2015: The Animal Welfare Amendment Act (No 2) 2015

EXECUTIVE SUMMARY

Animal welfare exists on a spectrum. Inevitably animal welfare organisations, industry, Governmental organisations and the public sit at various points along this spectrum, with each stakeholder having their own expectations for what constitutes an appropriate standard of farmed animal welfare.

However, it is now accepted that the minimum standards of animal welfare need to always be improving incrementally, in accordance with evolving public expectations and new scientific literature. As the Ministry for Primary Industries (**MPI**) Winter Grazing Taskforce recently recognised "The end goal for animal welfare is that everyone understands and accepts that there will always be a demand for better animal welfare."[1] Similarly, as far back as 1990 the then Ministry for Agriculture and Fisheries (now the Ministry for Primary Industries) stated: "Animal management practices and public attitudes both change with time and so this debate needs revisiting regularly."[2] This attitude is also reflected to varying degrees by industry. As Jenny Jago of DairyNZ stated:[3]

> I think the point of the Codes, just like farming, is continuous improvement - so continually reviewing and checking to see what new information we now know and therefore what expectations have changed, either by the sector or others, so that we can have that review process.

This report is part of that evolutionary process of continual improvement, as it comprehensively analyses the codes of welfare (**'codes**') and regulations established under the Animal Welfare Act 1999 (**the Act**) and the processes by which the codes and regulations were established.

Through so doing, we hope to instigate and contribute to a comprehensive review of the codes and regulations by the National Animal Welfare Advisory Committee (**NAWAC**), and encourage changes to the ways in which this delegated legislation is developed and administered. This is necessary to ensure that New Zealand's animal welfare standards continue to improve; that we have world-leading standards of animal welfare; and that our standards honour what is enshrined in the Act.

OUR RESEARCH

We have undertaken an evidenced-based, fine-grained analysis of the codes of welfare and regulations for dairy cattle, pigs, layer hens and meat chickens, as well as analysing the lack of (and need for) a code of welfare for farmed fish. This includes undertaking a comprehensive review of the National Animal Welfare Advisory Committee's (**NAWAC**) reports to the relevant codes of welfare, and the scientific literature NAWAC reviewed in creating the codes.

Our analysis has revealed a substantial gap between the overarching standards of animal welfare prescribed by the Animal Welfare Act 1999 and the standards that are provided for in its delegated legislation, being codes of welfare and regulations. In particular, this delegated legislation fails to ensure that the 'physical, health and behavioural needs' of animals are met, as required by s 10 of the Act. There is then a demonstrable need for the codes of welfare and regulations to be reviewed.

In addition, we have found that the processes by which the codes of welfare and regulations under the Act are developed by NAWAC under MPI are in need of reform. This was recently highlighted by judicial

1 Winter Grazing Taskforce *Final report and recommendations: Improving Animal Welfare on Winter Grazing Systems* (Ministry for Primary Industries, November 2019) at 9

2 Ministry of Agriculture and Fisheries *A Review of the Animals Protection Act 1960: Public Discussion Paper* (December 1990), at ii

3 Interview with Jenny Jago, DairyNZ, Strategy and Investment Leader – Farm Performance at DairyNZ (the author, 1 November 2019)

review proceedings in *The New Zealand Animal Law Association v The Attorney General* [2020] NZHC 3009, where NZALA successfully challenged the provisions relating to farrowing crates and sow stalls in the Code of Welfare (Pigs) 2018 and the Animal Welfare (Care and Procedures) Regulations 2018. In this case the High Court identified flaws in the processes NAWAC used to draft these provisions and deemed the provisions unlawful and invalid. While the deficiencies throughout the particular codes and regulations are significant, these are also subsidiary to the underlying systematic defects in how the codes and regulations are established by NAWAC. If these processes cannot be improved, the development of animal welfare law and policy in New Zealand will always be frustrated.

DEFICIENCIES IN THE CODES OF WELFARE

This report finds the following practices in the codes of welfare and regulations to be inconsistent with the Act:

CODE OF WELFARE (DAIRY CATTLE) 2019:

- Lack of access to shelter in both summer and winter conditions;
- Inadequate provision for extreme weather events on dairy farms;
- Problematic practices associated with winter-grazing which are not expressly addressed in the code of welfare;
- The use of off-paddock facilities and lack of access to pasture compromising animal health and frustrating the behavioural needs of dairy cattle;
- Inadequate provisions relating to stocking density of dairy cattle;
- Inadequate provision for the expression of dairy cows' behavioural needs (e.g. lying down, playing, grooming, maternal behaviours and foraging to explore, consume and select feed);
- Inadequate provision for managing the mixing of dairy cattle;
- Issues associated with restraint (e.g. in relation to the use of electroimmobilisation devices and tethering of dairy cattle);
- A lack of adequate limitations on the use of electric prodders on dairy cows (e.g. that it be applied for only very short durations, that multiple applications be adequately spaced and that it not continue to be used if the animal fails to respond) and no limitation on the use of goads the ears and nose (which are sensitive parts of the animal);
- Inadequate provision for drying off in dairy cattle;
- Ability of untrained operators to conduct pregnancy examinations and high rates of dystocia (the slow and/or difficult birthing of a calf to a cow);
- Lack of minimum standards preventing premature birthing induction in pregnant cows;
- High levels of ammonia permitted at 25 ppm;
- Inadequate provision for preventing lameness in dairy cattle;
- Inadequate provision for preventing other health issues common in dairy cattle (such as metabolic disease, mastitis, Johne's disease and broken shoulders); and
- Health issues associated with the selective breeding of dairy cattle for high milk yield.

PIGS:

- The intensive confinement of pigs in farrowing crates and sow stalls wherein sows are incapable of expressing their behavioural needs. That farrowing crates and sow stalls are inconsistent with the Act was recently confirmed by the High Court in a judicial review proceeding brought by NZALA and SAFE;[4]
- Insufficient provisions to ensure adequate nest-building materials are provided to sows during farrowing, despite the deeply ingrained need they have to exhibit this behaviour;
- Insufficient space provided for 'weaners', 'grower pigs' and 'finishers';
- Lack of clarity regarding shelter provided to pigs with access to the outdoors;
- Inadequate provision for pigs' behavioural needs (e.g. play, rooting and foraging, wallowing, socialising and nesting);
- Premature weaning of piglets, which leads to health and behavioural issues;
- Concerns associated with elective husbandry procedures (including the docking of pigs' tails; clipping or grinding their front teeth; the use of nose rings, clips or wires; notching/tagging/punching/tattooing of ears; tusk trimming; and castration). Many of these procedures are only necessary due to the close confinement of farmed pigs; are painful to pigs; and the code does not require pain relief to be provided in respect of some of these procedures;
- A lack of adequate limitations on the use of electric prodders on pigs (e.g. that it be applied for only very short durations, that multiple applications be adequately spaced and that it not continue to be used if the animal fails to respond) and no limitation on the use of goads on the ears and nose (which are sensitive areas for pigs);
- High levels of ammonia allowed at 25 ppm;
- Inadequate lighting requirements;
- Inadequate provision for managing the mixing of pigs, which can lead to aggression and fighting; and
- Inadequate provision regarding genetic selection of pigs.

4 For instance, in 2014 New Zealand sat alongside countries like Switzerland, the United Kingdom and Austria as leaders in animal welfare according to an index established by the international animal welfare charity, World Animal Protection. This was largely due to the enactment of the Animal Welfare Act 1999 and the protections afforded to animals as a result of this Act, with the World Animal Protection Act stating "The Animal Welfare Act… is a good example of how the country is continuing to make positive change for animals." (World Animal Protection "New Zealand leads the way on our Animal Protection Index" (21 January 2015) <https://www.worldanimalprotection.org.nz/news/new-zealand-leads-way-our-animal-protection-index>). Prominent animal welfare researcher Peter Singer, cofounder of the Great Ape Project and a Professor of Bioethics at Princeton University's *Centre for Human Values* considered the legislation a major breakthrough (Canadian Fedn. Of Humane Societies, *Legislative Breakthrough for Great Apes in New Zealand*, 15 Caring for Animals (newsletter of the Canadian Federation of Humane Societies) 6 (Winter 2000) (available at http://www.cfhs.ca/CaringForAnimals)). The Ministry for Primary Industries has often touted the Act has highly progressive for its time, on one instance stating "[t]he Animal Welfare Act has received considerable international attention for its progressive nature" (David Bayvel "A Duty of Care to Our Animals" *New Zealand Herald* (online ed, 2 May 2002)). Similarly, John Luxton, the first Minister responsible for administering the Act noted when it passed through Parliament that it "represents a significant change in philosophy from the current Animal Protection Act, now nearly forty years old. The Bill focuses on punishing acts of cruelty [and] adopts a more active and preventive approach" ((5 October 1999) 580 NZPD 19745. Politician John Banks stated "[t]he legislation being deliberated on here tonight is at the forefront of international animal welfare legislation. It is at the leading edge. It is not often that this Parliament discusses legislation that is at the leading edge of global opinion" ((16 June 1999) 578 NZPD 17450).

MEAT CHICKENS:

- Allowance of selective breeding and rapid growth rates (which is associated with health issues such as lameness, heart problems, ascites and sudden death syndrome);
- High stocking densities which impact on the health and behavioural needs of meat chickens;
- Inadequate provision for the behavioural needs of meat chickens (e.g. jumping, flying, roosting, exploration, dust bathing, perching, foraging, running);
- No requirement that meat chickens should have access to the outdoors and lack of measures to ensure that meat chickens do use the outdoors when available;
- Issues associated with temperature and ventilation in relation to contingency planning. This led to an incident in 2018 at Stoney Creek Farm in West Auckland where 50,000 chickens burned to death, and to an incident in 2019 at a farm in Helensville where 190,000 chickens suffocated to death;
- Insufficiently high temperatures for newly hatched chicks;
- High levels of ammonia allowed at 20 ppm;
- Inadequate protection from stress and injury caused to meat chickens as a result of catching;
- Inadequate lighting requirements;
- No provision for a cleanliness score in relation to litter management;
- The lack of a code of welfare for meat chicken breeder birds; and
- A potentially high incidence of meat chickens dying prematurely.

LAYER HENS:

- Use of colony cages and consequent limitation on the behavioural expression of layer hens (e.g. running, jumping, spreading their wings, accessing daylight, preening, sunbathing, dust bathing, foraging and scratching);
- Allowance of high stocking densities, which impacts on hen health and ability to express behavioural needs;
- Inadequate provision for the behavioural needs of layer hens (e.g. preening, wing flapping, head shaking, tail wagging, feather ruffling, beak wiping, unilateral wing-leg stretching, access to the outdoors and access to environmental enrichment);
- No access to the outdoors required;
- Inadequate access to shade and shelter;
- High levels of ammonia allowed at 20 ppm;
- Inadequate lighting requirements;
- Inadequate protection from stress and injury caused to layer hens as a result of catching;
- Allowance of beak trimming (otherwise known as ‘beak tipping’);
- Inadequate protection from welfare issues associated with the maceration and gassing of live male chicks; and
- Inadequate protection from health issues associated with selective breeding, including osteoporosis, keel bone fractures, cloacal prolapse, salpingitis and tumors.

FARMED FISH:

We have found that the lack of a code of welfare for farmed fish is problematic as this means little guidance is provided to those in the industry as to adequate standards of animal welfare. In particular, we identify risk areas where practices may exist that are inconsistent with the Act and which would therefore need to be addressed in a code of welfare and/or regulations. These include in relation to:

- Handling of fish;
- Stocking densities;
- Holding facilities:
- Bone deformities;
- Use of vaccinations and veterinary medicines;
- Food;
- Water quality; and
- Lighting.

Additionally, we have found that the Code of Welfare (Commercial Slaughter) 2018 needs to be amended along with the Act itself, in order to ensure that both farmed fish and wild-caught fish are rendered insensible prior to being killed. This is particularly important in relation to wild fish, as:

a) there are currently no provisions relating to approved slaughter techniques for these animals; and

b) because fishing operations that catch and destroy wild fish are not bound by the Act's general welfare provisions.

This means that the thousands of tonnes of wild fish caught in New Zealand's waters every year do not currently need to be treated humanely, or receive a humane death.

DEFICIENCIES IN THE PROCESSES BY WHICH CODES OF WELFARE AND REGULATIONS ARE ESTABLISHED BY NAWAC

This report identifies concerns with the processes by which the codes of welfare and regulations were established by NAWAC.

We are concerned by the manner in which NAWAC has reviewed the available scientific literature. For example, there are many instances in which NAWAC has acknowledged the relevant science in relation to an animal welfare issue and subsequently ignored it in favour of industry standards or practice; where NAWAC failed to comprehensively review the latest available scientific literature and did not refer to relevant studies; where NAWAC prioritised commercial standards over the test outlined in the Act to meet the 'physical, health and behavioural' needs of animals; and where NAWAC has not updated a code of welfare or regulations for many years despite scientific developments.

The inadequacy of NAWAC's processes was recently highlighted in judicial review proceedings in the High Court. These proceedings were brought by NZALA and SAFE in regards to farrowing crates and sow stalls. The Court found that the delegated legislation promulgated as a result of NAWAC's

recommendations in relation to farrowing crates and sow stalls[5] "circumvented Parliament's intention in enacting the 2015 Amendment"[6] and were "contrary to the purposes of the Act".[7] NAWAC had recognised on numerous occasions that the relevant standards did not meet the obligations prescribed by the Act. Despite this, NAWAC changed its advice to the Minister of Agriculture in 2016 stating that the standards *did* meet the obligations under the Act – without having any scientific basis for their change in view. As the Court recognised, these standards should have been phased out under the new s 183A(3) brought in by the Animal Welfare Amendment Act (No. 2) 2015 (**the Amendment Act 2015**).

The inadequacy of NAWAC's processes of scientific review is also evidenced by the inconsistency that exists between the codes of welfare and the extent of literature that has been reviewed in relation to each animal, with NAWAC reviewing far more scientific literature in relation to some animals, than others. Additionally, there have been incidents where we consider NAWAC failed to adequately consider public submissions on the codes of welfare.

There is a lack of transparency in regards to the methodologies NAWAC uses to develop the codes of welfare and regulations. In particular it is unclear:

a) How NAWAC reviews the latest scientific literature and good practice (for example, it is unclear what databases NAWAC uses; how it ensures that its methodological processes are robust; and how it acknowledges and accounts for its own bias in the search for and interpretation of data); and

b) How NAWAC and MPI set their priorities in relation to animal welfare law and policy.

This lack of transparency was further evidenced by our correspondence with MPI, who were unwilling to engage with us directly via a face-to-face interview. Their subsequent written answers to our interview questions were highly general in nature; largely referred to information that was already publicly available; and did not directly answer most of the questions posited to them. This lack of willingness to genuinely engage was unfortunate, and contrasted starkly with the willingness of all other parties contacted to provide information, including a wide range of animal industry representatives. It prevented us from gaining greater insight into the work of MPI and NAWAC on animal welfare from their institutional perspective, including in relation to the challenges and limitations they face and how their work on animal welfare may be better supported. It also reinforced the need for independent oversight of NAWAC's animal welfare functions. Such oversight is particularly important, given the perceived and/or actual conflict of interest inherent in a body associated with MPI developing the codes of welfare, at the same time as MPI being responsible for fostering agricultural production in New Zealand.

5 Being regulations 26 and 27 of the Animal Welfare (Care and Procedures) Regulations 2018 and Minimum Standards 10 and 11 of the Code of Welfare (Pigs) 2018.

6 High Court (press release, 13 November 2020) at [15] and [16]

7 At [15] and [16]

OUR RECOMMENDATIONS

REFORM OF THE CODES OF WELFARE, REGULATIONS AND THE ANIMAL WELFARE ACT 1999

- We recommend NAWAC undertake a comprehensive review of the existing codes and regulations and revise them in light of the latest available scientific knowledge and good practice.
- We recommend that a code of welfare for farmed fish be established.
- Any practices that are identified as being inconsistent with the Act in NAWAC's review, which cannot be revised immediately, should be regulated by regulations under s 183A, subject to the phase-out periods of up to 10 - 15 years in accordance with the section. This approach would ensure the eventual elimination of all practices incompatible with the Act.
- Subsequent to this review, NAWAC should be required to review the codes and regulations every five years to ensure that they are up-to-date and based on the latest scientific knowledge and good practice.
- Section 73(3) of the Act allows NAWAC to take into consideration practicality and economic impact in establishing the codes. We recommend that NAWAC should be required to consider also the opportunities for environmental and behavioural enrichment for animals in whatever environment they are housed.
- We recommend revisions to the Act and Code of Welfare (Slaughter) 2018 to prevent the inhumane killing of farmed finfish and fish caught in the wild. These revisions would require these animals to be rendered insensible prior to being slaughtered.

REFORM OF NAWAC'S PROCESSES

We recommend reform to NAWAC's processes so as to ensure that the objectives and standards of the Act are being met through delegated legislation in both the codes of welfare and the regulations.

- We recommend a review of the processes by which the codes and regulations are established, in particular a review of the methodologies used by NAWAC to assess the latest scientific information and good practice; a review of the public consultation process which NAWAC undertakes in relation to codes of welfare and regulations; a review of the extent to which public submissions on the codes and regulations are taken into consideration; and a review of the opportunities for collaboration between NAWAC and other stakeholders including animal welfare organisations and academia, in the development of the codes and regulations. We recommend this review be undertaken under the auspices of a public or Government inquiry.
- We recommend the performance of NAWAC and MPI in relation to animal welfare be audited or overseen by another Government agency or an independent body.
- Ultimately, we consider that the establishment of an adequately funded Independent Commissioner for Animals or an independent committee for animal welfare would be the best approach to ensure that the codes of welfare and regulations are robust, up-to-date and meet the requirements of the Act.
- An increase in funding for the development and enforcement of animal welfare law and policy is required. Inadequate funding has contributed to the deficiencies in the process by which the codes of welfare and regulations are established by NAWAC and to the manner in which these forms of delegated legislation are enforced.

ADDITIONAL RECOMMENDATIONS

We make a number of additional recommendations in this report, to assist in facilitating the implementation of good standards of animal welfare. These include:

- The use of Government or industry led subsidies, to financially support farmers in implementing higher standards of animal welfare.
- Continued collaboration between industry, NAWAC and animal advocacy organisations, such as the NZALA.

“CONSUMERS ARE BEING INFLUENCED BY “CONSCIENCE FACTORS”, RATHER THAN ONLY COST, AND ARE NOW MOVING TO TAKE A “CONCEPTION TO CONSUMPTION” INTEREST IN FARMING AND ABATTOIR PRACTICES AND THE ASSOCIATED ANIMAL WELFARE STANDARDS.”

MPI - 2017 REGULATORY IMPACT STATEMENT

CHAPTER 1 - INTRODUCTION

1.1 OVERVIEW

This report provides an in-depth analysis of the legal standards regulating farmed animal welfare in New Zealand. In particular, it identifies and examines a gap between the law as it is provided for in the Animal Welfare Act 1999 and its application under this Act's delegated legislation, being codes of welfare and regulations.

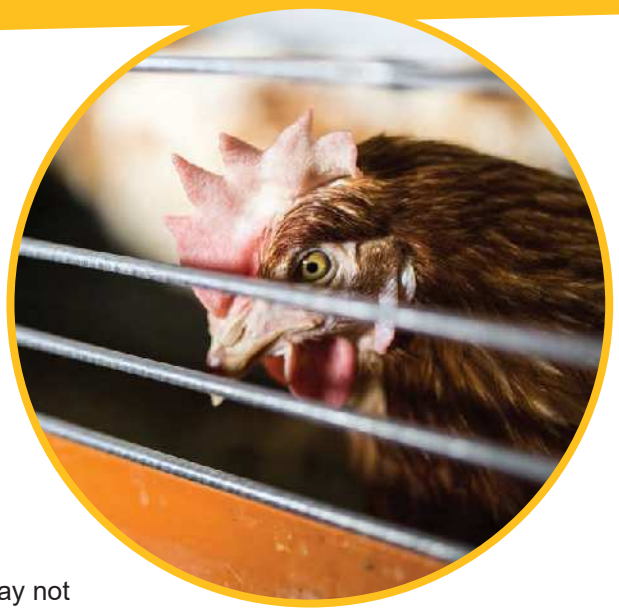
The Animal Welfare Act 1999 has been lauded, both nationally and internationally, as highly progressive.[8] Compared to its historical equivalents, which established provisions to prevent overt cruelty to animals, the Act provides for a more preventative and proactive approach. Owners and persons in charge of animals are required to ensure that the "physical, health and behavioural needs" of animals are met.[9] These are defined as proper and sufficient food; proper and sufficient water; adequate shelter; the opportunity to display normal patterns of behaviour; physical handling in a manner which minimises the likelihood of unreasonable or unnecessary pain or distress; and protection from, and rapid diagnosis of, any significant injury or disease.[10] These are also known as the 'five freedoms' and are now a widely accepted concept within animal welfare theory.[11]

8 For instance, in 2014 New Zealand sat alongside countries like Switzerland, the United Kingdom and Austria as leaders in animal welfare according to an index established by the international animal welfare charity, World Animal Protection. This was largely due to the enactment of the Animal Welfare Act 1999 and the protections afforded to animals as a result of this Act, with the World Animal Protection Act stating "The Animal Welfare Act… is a good example of how the country is continuing to make positive change for animals." World Animal Protection "New Zealand leads the way on our Animal Protection Index" (21 January 2015) <www.worldanimalprotection.org.nz/news/new-zealand-leads-way-our-animal-protection-index>. Prominent animal welfare researcher Peter Singer, cofounder of the Great Ape Project and a Professor of Bioethics at Princeton University's *Centre for Human Values* considered the legislation a major breakthrough. Canadian Fedn. Of Humane Societies, *Legislative Breakthrough for Great Apes in New Zealand*, 15 Caring for Animals (newsletter of the Canadian Federation of Humane Societies) 6 (Winter 2000) (available at http://www.cfhs.ca/CaringForAnimals). And the Ministry for Primary Industries has often touted the Act has highly progressive for its time, on one instance stating ""[tihe Animal Welfare Act has received considerable international attention for its progressive nature."David Bayvel "A duty of care to our animals" *NZ Herald* (online ed, New Zealand, 2 May 2002). Similarly, the Minister responsible for administering the Act noted when it passed through Parliament that it "represents a significant change in philosophy from the current Animal Protection Act, now nearly forty years old. The Bill focuses on punishing acts of cruelty [and] adopts a more active and preventive approach." New Zealand Parliamentary Debates, *Animal Welfare Bill (No. 2)*, 580 NZPD 19745 (Oct. 5, 1999) (statement of John Luxton). Similarly, politician John Banks stated "[T]he legislation being deliberated on here tonight is at the forefront of international animal welfare legislation. It is at the lead- ing edge. It is not often that this Parliament discusses legislation that is at the leading edge of global opinion." New Zealand Parliamentary Debates, *Animal Welfare Bills,* 578 NZPD 17450 (June 16, 1999) (statement of John Banks).

9 Animal Welfare Act 1999, s 10

10 Section 4

11 The 'five freedoms' are the freedom from hunger or thirst; freedom from discomfort; freedom from pain, injury or disease; freedom to express (most) normal behaviour; and freedom from fear and distress. The 'five freedoms' is a concept fundamental to animal welfare theory, with its origin in the 1965 Brambell Committee *Report (F W Rogers Brambell Report of the Technical Committee to Enquire into the Welfare of Animals kept under Intensive Livestock Husbandry Systems* (Her Majesty's Stationery Office, [ca. 1965], 1965). The 'five freedoms' have been adopted by veterinarians as well as animal welfare organisations such as the RSPCA, the World Organisation for Animal Health and the American Society for the Prevention of Cruelty to Animals. These 'freedoms' have recently been updated to recognise the importance of positive experiences for animals (in addition to the avoidance of negative experiences), leading to an updated concept of animal welfare called the 'five provisions', being good nutrition, good environment, good health, appropriate behaviour and positive mental experiences. See Mellor, D. J. "Enhancing Animal Welfare by Creating Opportunities for Positive Affective Engagement." (2015) 63 N Z Vet J 3; and Mellor, D.J. "Updating Animal Welfare Thinking: Moving Beyond the "Five Freedoms" Towards "a Life Worth Living"." 6 Animals 21 at 21



While the Act contains general provisions (such as the requirement to meet the physical, health and behavioural needs of animals), the codes of welfare established under the Act are intended to provide specific guidelines in relation to particular species or use of animals.[12] In addition, regulations under the Act "complement the minimum standards outlined in the codes of welfare and the more general and serious offences provided under the Act",[13] and are directly enforceable by way of infringement notices and fines.

This report finds that the codes of welfare and regulations may not be providing adequately for the 'physical, health and behavioural needs' of animals, as required by the Act. This gap has been recognised by the Ministry for Primary Industries, the Government body responsible for animal welfare. In a recent report prepared by the Winter Grazing Taskforce (which was constituted by MPI in 2019), the Taskforce stated: "Codes of welfare are not aligned with emerging scientific understandings of sentience."[14] The fact that the codes fall beneath the standards prescribed by the Act is highly significant, as compliance with the codes operates as a defence to a breach of the Act. As Hans Kriek of Save Animals from Exploitation (**SAFE**) stated:[15]

> We have a fairly good [Animal Welfare Act], but it's completely undermined by having these terrible codes – that has been our big problem over years of campaigning, because as long as farmers comply with the codes of welfare, then they can't be prosecuted for anything.

In this report we will examine the standards contained in the regulations and codes of welfare for farmed animals, and how these derogate from the parent legislation. And we will identify reforms that would reconcile the two, to ensure that animals have access to the five freedoms prescribed by the Act.

This report concentrates on what appear to be the most problematic codes in relation to farmed animals. These include the Code of Welfare (Meat Chickens) 2018, with meat chickens comprising the vast majority of farmed land animals in New Zealand (being over 125 million animals). The report examines the Code of Welfare (Pigs) 2018 and the Code of Welfare (Layer Hens) 2018, as these animals (along with meat chickens) experience the most severe forms of intensive confinement under current farming practices. Finally, the report considers the Code of Welfare (Dairy Cattle) 2019 and the absence of any code of welfare for fish. In so doing, the report also analyses the regulations relevant to these animals that have been promulgated under the Animal Welfare (Care and Procedures) Regulations 2018. Many of these regulations mirror what is already contained in the codes and for completeness, we have reviewed their content alongside the relevant codes. We note that although beef cattle and sheep are both significant industries in New Zealand, we have not considered the welfare issues relevant to these animals or the codes of welfare and regulations pertaining to them. This is based on necessity, as conducting an in-depth review of the delegated legislation for these animals in addition to the ones we have considered would not have been feasible within the relevant timeframe.

12 There are currently 19 codes of welfare relating to circuses; cats – pet or companion; dairy cattle; deer; dogs; goats; horses and donkeys; layer hens; llamas and alpacas; meat chickens; ostriches and emus; painful husbandry procedures; pigs; rodeos; sheep and beef cattle; slaughter of animals; temporary housing of companion animals; transport of animals and zoos.

13 Ministry for Primary Industries *Regulatory Impact Statement: Overview of required information Animal Welfare Regulations 2017* (April 2018)

14 At 5

15 Interview with Hans Kriek, former SAFE Ambassador (the author, 8 November 2019)

In addition to our examination of the content of the Act and codes, this report addresses issues associated with the process by which the codes of welfare are established. We find that the methodologies adopted by the National Animal Welfare Advisory Committee in preparing the codes have often failed to ensure that the standards prescribed are at least the minimum necessary to ensure that the purposes of the Act are met, as expressly required by s 73(1)(a) of the Act. We consider that this has been due to an often inadequate and inconsistent review of the available scientific literature, and a failure to adequately consult and engage with the public.

Despite the significance of farmed animal welfare to New Zealand's economy and society, legal scrutiny of the regulation of farmed animal welfare has been highly neglected. As far as we are aware, a comprehensive report of this nature, which investigates and identifies the gaps between the Act and the codes and regulations, has never been undertaken. This is despite the Animal Welfare Act 1999 having been in force for over twenty years, and the first codes having been promulgated shortly thereafter. It is critical then that the implementation of this legislation through these delegated instruments be assessed closely.

This report is structured as follows:

- Chapter one comprises this introduction; an analysis of the context within which this discussion takes place; an outline of the methodology we have used; and the scope and limitations of this report.
- Chapter two provides a detailed outline of the legal regime governing animal law in New Zealand; analyses the processes by which the codes of welfare were established; and assesses these processes as they have been undertaken by MPI and NAWAC.
- Chapter three outlines stakeholder perspectives on this topic and the importance of collaborating with industry in progressing animal welfare standards.
- Chapters four, five, six and seven provide a fine-grained analysis of the codes of welfare and regulations for dairy cattle, pigs, meat chickens and layer hens, respectively, and examines how these codes and regulations fail to provide for the physical, health and behavioural needs of animals as required by the Act. Chapter eight addresses the absence of a code of welfare for fish.
- Chapter nine contains our recommendations for reform.

1.2 CONTEXT

In 2014, New Zealand sat alongside countries like Switzerland, the United Kingdom and Austria as leaders in animal welfare according to an index established by the international animal welfare charity, World Animal Protection. All of these countries received an "A" rating at this time,[16] and MPI and animal agricultural industries have frequently cited this fact and made numerous claims that New Zealand is world leading in upholding high standards of animal welfare.[17]

A number of the stakeholders interviewed for this report commented on New Zealand's relative success in implementing high animal welfare standards compared to our international counterparts. Jenny Jago of DairyNZ stated in relation to dairy cattle: "our cows are managed in groups, there's space, opportunities to exhibit social behaviour just simply through the nature of the pastoral farming system."[18] Similarly, Michael Brooks of the Poultry Industry Association of New Zealand (**PIANZ)** and Egg Producers Federation (**EPF**) commented that New Zealand has high standards of animal welfare when compared with its international counterparts.[19] Julie Geange of Federated Farmers stated that New Zealand is "competing on the world market with other countries that have appalling standards."[20] Even animal advocacy organisations such as the RNZSPCA have stated:[21]

> New Zealand is ahead of most other countries…In some of the largest animal producing countries of the world such as China, India and Brazil, animal welfare legislation is largely absent.

However, in March 2020 World Animal Protection launched its new animal protection index, which saw New Zealand drop from an "A" ranking to a "C" ranking – now sitting alongside countries such as India, Mexico, Malaysia, Poland, Germany, France and Spain. Part of the reason for this low ranking was the unenforceability of the codes of welfare and the fact that they "undermine the purposes and principles of the Animal Welfare Act, by providing defences to conduct contrary to the Act".[22] World Animal Protection lists layer hens in cages; confining pigs to farrowing crates; tethering of dairy cattle; and failure to provide for a mandatory minimum standard regarding the provision of manipulatory material such as straw for

16 Animal Protection Index "New Zealand" <https://api.worldanimalprotection.org>. The index considers the 50 nations in the world that produce the most beef, poultry, pork, sheep, goat, milk and eggs. It assesses nations against a number of indicators including recognition of animal sentience and prohibition of animal suffering; presence of animal welfare legislation that protects animals in farming, animals in captivity, companion animals, animals used for draught and recreation, animals used in scientific research and wild animals; the establishment of supportive government bodies; and support for international animal welfare standards including the World Organisation for Animal Health' (OIE) animal welfare standards and the Universal Declaration on Animal Welfare.

17 As in Beehive.govt.nz "New Animal Welfare Regulations Progressed"(July 20, 2017) <https://www.beehive.govt.nz/release/new-animal-welfare-regulations-progressed> (accessed 28 March 2020) ("In 2014, New Zealand's animal welfare system was ranked 1st equal out of 50 countries assessed by the global animal protection charity World Animal Protection");, in Jody O'Callaghan "Enforcement of New Zealand's Animal Welfare Act 'inadequate'", *The Press* (online ed, New Zealand, 14 May 2017) <https://www.stuff.co.nz/the-press/news/92556879/enforcement-of-new-zealands-animal-welfare-act-inadequate>, quoting then Minister for Primary Industries Minister Nathan Guy as saying "Global charity World Animal Protection ranked New Zealand first equal for its animal welfare systems";, Scott Gallacher (then Deputy-Director General, Regulation and Assurance at MPI) "Treating Animals Well is Part of the Kiwi Culture" *Dominion Post* (online ed, New Zealand, 15 June 2015)(accessed March 30, 2020) <https://www.stuff.co.nz/dominion-post/comment/69402025/treating-animals-well-is-part-of-the-kiwi-culture>("Last year, for example, the global charity World Animal Protection ranked New Zealand first equal alongside the United Kingdom, Austria, and Switzerland for our animal welfare systems"); Gerard Hutching "Animal welfare activists demand cameras in every milking shed" *Stuff* (online ed, New Zealand, 29 June 2018) (accessed 30 March 2020) <https://www.stuff.co.nz/business/farming/105109588/animal-welfare-activists-demand-cameras-in-every-milking-shed>, citing a Fonterra spokeswoman as saying "New Zealand was ranked first out of 50 countries on the International Animal Protection Index"; and DCANA "About the NZ dairy industry" <https://www.dcanz.com/about-the-nz-dairy-industry> (accessed 28 March 2020).

18 Interview with Jenny Jago, above n 3

19 Interview with Michael Brooks, Executive Director of the Poultry Industry Association and Egg Producers Federation (the author, 11 November 2019)

20 Interview with Julie Geange, Policy Adviser - Meat and Wool and Animal Welfare, Federated Farmers (the author, 8 November 2019).

21 Gerard Hutching "Behind New Zealand's most popular meat" *Stuff* (online ed, New Zealand, 21 October 2018) <https://www.stuff.co.nz/business/farming/107888831/behind-new-zealands-most-popular-meat>/

22 Animal Protection Index, above n 16

pigs, as some examples of where the codes fail to meet the standard outlined in the Act of providing for the 'physical, health and behavioural needs' of farmed animals.[23]

The Voiceless Animal Cruelty Index similarly considers New Zealand "only a marginally adequate performer… due to its high levels of animal production and consumption."[24] Farmed animals make up the overwhelming majority of domesticated animals in New Zealand. As at 2016, New Zealanders owned approximately 4.6 million pets.[25] In contrast, New Zealand annually farms approximately 6.35 million dairy cattle;[26] 3.92 million beef cattle;[27] 125 million meat chickens;[28] 621,248 pigs;[29] 3.94 million layer hens;[30] 27.4 million sheep;[31] and approximately 116 thousand tonnes of seafood.[32] These statistics reflect the fact that agriculture is a significant industry in New Zealand, generating around 36 billion dollars a year in exports and constituting around 12% of New Zealand's GDP,[33] with New Zealand accounting for around a third of the world's international dairy trade.[34] It is in this context that high standards of animal welfare, which is recognised as important to overseas consumers, are now a goal of many industry bodies in New Zealand. Further, these high standards are inherently important to many New Zealanders. For example, in a 2010 MPI report New Zealanders ranked farm animal welfare as the sixth most important social issue out of a total of 14 issues.[35] If New Zealand's animal welfare legislation is to meaningfully achieve its objectives we must ensure that the welfare of our farmed animals is adequately protected. This is important not only in respect of our trading reputation, but to ensure that such standards align with our values as a country.

Legislative change is the key mechanism for achieving this. It is true that consumers can choose to consume 'free-range' animals and animal products, which are verified by quality assurance schemes. However, free-range products are still a minority of all animal products consumed in New Zealand; the standards in place for free-range animals obviously do not apply to all animals; and the use of the term 'free-range' does not guarantee that animals are have been raised free-range, despite the existence of quality assurance schemes designed to ensure this.

An additional aim of this report is to promote awareness of the codes of welfare to farmers, as there is a concern that the codes of welfare and regulations are not sufficiently well known. We recommend that a minimum standard be established in all the codes of welfare requiring a copy of the code to be prominently displayed on site at all times, and requiring the code to be regularly reviewed by all staff responsible for the care of animals.

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23 Animal Protection Index

24 Voiceless the animal protection institute "New Zealand overall cruelty Rank 30" <https://vaci.voiceless.org.au/countries/new-zealand/>

25 "Kiwis world leaders in pet ownership" *NZ Herald* (online ed, New Zealand, 17 August 2016) <https://www.nzherald.co.nz/lifestyle/news/article.cfm?c_id=6&objectid=11694903>

26 Stats NZ "Agriculture" <https://www.stats.govt.nz/topics/agriculture>

27 Stats NZ

28 "Surge in chicken consumption prompts new testing probe" *ODT* (online ed, New Zealand, 25 June 2019) <https://www.odt.co.nz/business/surge-chicken-consumption-prompts-new-testing-probe>

29 Ministry for Primary Industries "Livestock slaughter statistics" (22 May 2020)

30 Figure.nz "Total hens for egg production on New Zealand farms" <https://figure.nz/chart/NJrkHqndarpsFDZa-33x67SqoNoRsxCL3>

31 Esther Taunton "NZ sheep population down to fewer than six per person" *Stuff* (online ed, New Zealand, 10 October 2019) <https://www.stuff.co.nz/business/farming/116439723/have-ewe-herd-nz-is-down-to-fewer-than-six-sheep-per-person>

32 A+ New Zealand Sustainable Aquaculture "New Zealand Aquaculture" (2018) <https://www.aquaculture.org.nz/wp-content/uploads/2018/08/New-Zealand-Aquaculture-facts-2018.pdf> at 8

33 Figure.nz "GDP breakdown by industry in New Zealand" (23 November 2018) < https://figure.nz/chart/WRpSmBftC60lEu2q>

34 LEARNZ "Primary Industries in New Zealand" <http://www.learnz.org.nz/primaryindustries172/bg-standard-f/primary-industries-in-new-zealand>

35 This was considered more important than reducing unemployment; increasing the value of NZ's exports; ensuring New Zealanders save enough for retirement; reducing problem gambling; getting more people to stop smoking; preventing accidents and injury around the home; reducing traffic congestion; reducing or adapting to climate change. Ministry of Agriculture and Forestry *What New Zealanders Really Think about Animal Welfare* (MAF Technical Paper No: 2011/55, March 2011).

Finally, we highlight the need to work with industry to ensure that more robust codes of welfare are produced and that they are complied with. Many of the interviews we conducted with industry stakeholders signalled that farmers feel publicly vilified, not only in relation to the impact of farming on the environment but also regarding animal welfare. This was attested to by both Federated Farmers[36] and Ngāi Tahu Farming.[37] We acknowledge that MPI/NAWAC and animal welfare organisations need to consult with industry and farmers regarding animal welfare standards, and that industry and farmer buy-in is an important element of ensuring that adequate standards are developed and implemented. The views of the various stakeholders to this report are discussed in more detail at chapter three.

1.2.1 NEW ZEALAND'S TRADING REPUTATION

Trade reputation is a strong driver of animal welfare policy in New Zealand, given our dependency on the primary sector and agriculture in particular. As Peter Sankoff has noted, calls for animal welfare reform in the 1990s came primarily from the agriculture industry as a result of the European Union undertaking such reform and calling for similar reform in New Zealand. Sankoff stated:[38]

> At risk of losing its major export market, both New Zealand farmers and legislators realised that the international playing field had changed, and that New Zealand had to make changes as well.

The increasing importance of animal welfare to consumers has been recognised by MPI on numerous occasions. In 2010, the then Ministry of Agriculture and Forestry developed a policy paper entitled *Safeguarding our Animals, Safeguarding our Reputation.* This paper stated:[39]

> [B]ecause consumers are becoming increasingly concerned about animal welfare issues, there is mounting international pressure for stronger welfare standards. Some restaurant and supermarket chains in Europe and North America are emerging as drivers behind new and stronger animal welfare standards. If New Zealand fails to meet international market-place expectations, its reputation will be harmed. Conversely, high standards of animal welfare will contribute to New Zealand's reputation as a trusted and sustainable producer of animals and animal products in key overseas markets.

In 2012, MPI commissioned a KPMG report, which found that "New Zealand must do more to protect the significant financial benefit derived from New Zealand's reputation for quality, sustainable and trustworthy agricultural products."[40] And in a 2017 Regulatory Impact Statement MPI stated:[41]

> There is an increasing trend of greater demands for improved animal welfare from consumers both in New Zealand and also in our main export markets. Consumers are being influenced by "conscience factors", rather than only cost, and are now moving to take a "conception to consumption" interest in farming and abattoir practices and the associated animal welfare standards. While results in surveys may differ somewhat from actual consumer behaviours when purchasing products, when price differentials are considered, such surveys are indicative of changing consumer preferences…An

36 Kerry Gray of Federated Farmers told us, "… there's so much negative publicity out there and our members feel very much under attack." Interview with Kerry Gray, Policy Adviser – Federated Farmers (the author, 25 November 2019).

37 Shane Kelly of Ngāi Tahu Farming stated that in the last five years or so in farming "…everything just seems to be negative and the messaging in the media is generally really poor and quite biased." Interview with Shane Kelly, former General Manager of *Ngāi Tahu Farming (the author, 1 November 2019).*

38 Peter Sankoff "Five Years of the 'New' Animal Welfare Regime: Lessons Learned from New Zealand's Decision to Modernize its Animal Welfare Legislation" (2005) 11 Animal L. 7 at 13.

39 Ministry of Agriculture and Forestry *Safeguarding our Animals, Safeguarding our Reputation: Improving Animal Welfare Compliance in New Zealand* (July 2010) at 6.

40 Ministry for Primary Industries *Regulatory Impact Statement: Options to Amend the Animal Welfare Act 1999* (May 2013) at 8-9 quoting the KPMG Agribusiness Agenda 2012.

41 Ministry for Primary Industries, above n 13, at 25

> illustration of the consumer preferences in key markets is shown by the report Attitudes of Europeans towards Animal Welfare, (March 2016). In this report it was found more than half (59%) of Europeans were prepared to pay more for products sourced from animal welfare-friendly production systems.

The importance of high animal welfare standards to our trading reputation is demonstrated in numerous Governmental responses to the issue of animal welfare. For example, the Select Committee report on the Animal Welfare Bill (No 2) 1999 stated:[42]

> Reform is necessary because the current Animals Protection Act 1960 is nearly 40 years old and is no longer considered adequate to meet New Zealand's domestic and trading needs. Demands have arisen for higher standards of animal welfare as a result of raised public consciousness here and overseas.

Similarly, our trading reputation was a significant consideration in implementing new animal welfare regulations in 2018. MPI stated:[43]

> …[these] new regulations will deliver benefits to animal welfare outcomes. They will also protect and enhance our domestic and international reputation as an ethical supplier of animals and animal products. It is difficult to quantify these benefits but they make an important contribution to New Zealand's strong international trade reputation and trading opportunities.

In its report on the Code of Welfare (Dairy Cattle) 2010, NAWAC recognised that the code was necessary as "an important statement to the international community and in particular, to overseas consumers of our animal and milk product exports of the welfare standards which prevail in New Zealand."[44]

Industry outrage in New Zealand at a 2015 SAFE campaign, which maligned the New Zealand dairy industry, demonstrated again how important animal welfare is to our trading reputation.[45] Farmers reacted strongly to advertisements placed in *The Guardian* newspaper by SAFE, which shamed the industry for its treatment of bobby calves (being newborn calves separated from their mothers).[46] The resulting media storm led MPI to file prosecutions under the Act[47] and to develop a suite of new regulations governing the treatment of bobby calves.[48]

Sound animal welfare practices add real value to our exports. As MPI stated in its 2012 Discussion Paper:[49]

> New Zealand…relies on animals for substantial parts of its economy…New Zealand's animal welfare practices add value to our exports by contributing to our reputation as a responsible agricultural producer. Animal welfare is increasingly important for accessing premium markets and differentiating New Zealand's products.

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42 Animal Welfare Bill (No 2) 1999 (209-2) (select committee report) at i-ii

43 Ministry for Primary Industries, above n 41, at 1

44 National Animal Welfare Advisory Committee *Animal Welfare (Dairy Cattle) Code of Welfare 2010 Report* at 2

45 Joel Maxwell "'New Zealand dairy cruelty' claims target UK consumer in Guardian ad campaign" *Stuff* (online ed, New Zealand, 6 December 2015). <https://www.stuff.co.nz/business/farming/74783076/new-zealand-dairy-cruelty-claims-target-uk-consumer-in-guardian-ad-campaign>

46 This event is discussed in depth in Danielle Duffield "Reputation, Regulatory Capture, and Reform: The Case of New Zealand's Bobby Calves" Animal Law Review (forthcoming).

47 *Erickson v. Ministry for Primary Industries* [2017] NZCA 271 at [1, 4] (N.Z.); *Ministry for Primary Industries v. Down Cow Limited* [2018] NZDC 20169 at [1] (N.Z.).

48 Animal Welfare (Care and Procedures) Regulations 2018. See, for example, regulation 8 which prohibits killing of calves by the use of blunt force to the head except in emergency situations; regulation 35which requires that loading and unloading facilities be provided when young calves are transported; and 36 which requires that young calves be provided with suitable shelter before and during transportation.

49 Ministry for Primary Industries *Animal welfare matters: Proposals for a New Zealand Animal Welfare Strategy and amendments to the Animal Welfare Act 1999* (Discussion Paper 2012/07) at 3.

1.2.2 THE IMPORTANCE OF ANIMAL WELFARE TO NEW ZEALANDERS

Animal welfare is important to New Zealanders. In 2012, the New Zealand Government sought the public's views on animal welfare to help it devise its Animal Welfare Strategy.[50] It found that in general New Zealanders care about animal welfare, with three key themes emerging from the public consultation process.[51] First, most of the respondents agreed that, as animals are sentient beings, it matters how they are treated. Secondly, the public generally recognised a responsibility both for animals in our care and for those affected by our activities. And finally, the majority of respondents agreed that it is acceptable to use animals for food so long as they are treated humanely, and our laws should keep pace with scientific knowledge and evidence.

In 2017 MPI issued a report on New Zealanders' views of the primary sector. Over 95% of respondents agreed, "It is important that the welfare of farmed animals in New Zealand is protected."[52] When then asked for their specific concerns regarding animal welfare, respondents spoke about caged animals, and corporate farming structures that would increase the negative impact on animal welfare.[53] Further, growing public opposition to caged farming was demonstrated by a 2018 nationwide Horizon Research poll finding that 73% of people support a ban on farrowing crates.[54] Farrowing crates were also the subject of one of the largest ever petitions to Parliament, with SAFE obtaining 112,000 signatures against their use.[55]

MPI has recognised the importance to New Zealanders of high animal welfare standards, stating in a Regulatory Impact Statement from 2017 that:[56]

> We also note the value to the New Zealand community of having strong laws in place to protect animals as this reflects an important self-belief that we have as New Zealanders – that we care well for our animals.

In short, our culture has moved far away from a view of animals as mere objects or property, as they have historically been conceptualised in our earliest animal protection laws. We understand, consistent with modern science, that animals can suffer and that we have a responsibility to minimise this suffering.

CONSUMER DECISION-MAKING

That New Zealanders value high standards of animal welfare is also demonstrated in consumer decision-making, with many New Zealanders giving up meat or animal products altogether. According to research conducted by Roy Morgan in 2016, 10.3% of New Zealanders consider themselves to be vegetarian, an increase of two percentage points from when the research had been conducted two years earlier.[57] Equally, suppliers of vegan and vegetarian food are reportedly struggling to keep up with the demand for their products, with as much as a 20% growth in plant-based products in 2017.[58] As at 2018 New Zealand

50 Ministry for Primary Industries *Animal welfare matters: New Zealand Animal Welfare Strategy* (May 2013). Animal Welfare (Care and Procedures) Regulations 2018. See, for example, regulation 8 which prohibits killing of calves by the use of blunt force to the head except in emergency situations; regulation 35which requires that loading and unloading facilities be provided when young calves are transported; and 36 which requires that young calves be provided with suitable shelter before and during transportation.

51 E.g. Mr Carter, Opposition Member for Raglan and a farmer (1 September 1960) 324 NZPD 2025; Mr Murray, Opposition member for Stratford (8 September 1960) 324 NZPD 2192.

52 Ministry for Primary Industries *New Zealander's views of the primary sector* (October 2017) at 83

53 At 90

54 "73% say ban farrowing crates" Horizon Poll (13 July 2018) <https://www.horizonpoll.co.nz/page/519/73-say-ban->

55 Zac Fleming "Farrowing Crates: The most significant animal welfare court case in NZ history" *Newshub* (27 June 2020) <https://www.newshub.co.nz/home/rural/2020/06/farrowing-crates-the-most-significant-animal-welfare-court-case-in-nz-history.html>

56 Ministry for Primary Industries, above n 41, at 5

57 Roy Morgan "Vegetarianism on the rise in New Zealand" (8 February 2016) < http://www.roymorgan.com/findings/6663-vegetarians-on-the-rise-in-new-zealand-june-2015-201602080028 >.

58 "Suppliers of vegan products struggling to keep up with demand from Kiwis" *1 News* (online ed, New Zealand, 8 October 2017)

ranked the third most interested in veganism in the world based on Internet search levels,[59] while one survey predicted that by 2025 a quarter of all New Zealanders will be meat-free.[60] Another study found that a third of New Zealanders are looking to eliminate or cut down on eating meat.[61] While there has been no comprehensive research done on the reasons many New Zealanders are opting to go meat or dairy free, one likely explanation is that New Zealanders are increasingly concerned about animal welfare.

These attitudinal changes have also coincided with a greater desire for free-range products. Approximately 80% of customers worldwide have been found to prefer "chicken products with [a] perceived higher quality derived from free-range (organic) systems with increased welfare standards."[62] Similarly, a 2016 New Zealand study recognised that consumers worldwide increasingly are taking into account issues of sustainability, equity and animal welfare in their food choices.[63] Such trends have manifested in New Zealand, with supermarkets and major food distributors such as McDonalds refusing to sell caged eggs, and a demand for caged-free eggs contributing to a national egg shortage in 2019.[64] Countdown's head of perishables and deli foods stated in response to this shortage that "New Zealanders are increasingly interested in social and environmental issues and this is influencing their purchasing."[65]A Consumer NZ 2019 survey further showed that free-range egg sales have increased 18% in the past two years in New Zealand.[66] Similarly, a recent report by Countdown supermarket confirmed that customers care about where their food comes from, and stated that Countdown are seeing "more and more Kiwis choose free-range and organic products."[67] As Mark Preece of the New Zealand Salmon Farmers Association stated:[68]

> …you want to know that your food is coming from a safe place…firstly, safe for you to eat as a consumer, but then you want to make sure that if you're farming animals that they're kept in conditions that are appropriate…customers are wanting that so industry needs to deliver those sorts of things.

59 "New Zealand ranks third in the world for veganism" *NZ Herald* (online ed, New Zealand, 14 January 2019) <www.nzherald.co.nz/lifestyle/news/article.cfm?c_id=6&objectid=12189925>

60 Thomas Manch "Survey predicts meat-free future" *Stuff* (online ed, New Zealand, 4 July 2017). <www.stuff.co.nz/life-style/food-wine/food-news/94325086/survey-predicts-meatfree-future>

61 "Third of New Zealanders eliminate or cut down on eating meat – research" *RNZ* (online ed, New Zealand, 29 October 2019) <www.rnz.co.nz/news/national/402028/third-of-new-zealanders-eliminate-or-cut-down-on-eating-meat-research>

62 A. El-Deek and K. El-Sabrout, "Behaviour and meat quality of chicken under different housing systems" (2019) 75 World's Poultry Sci J 105.

63 University of Otago in Wellington *Public Health Report: A discussion of labels as a vector for food information* (May 2016) at 14.

64 Karoline Tuckey "Demand for cage-free eggs contributes to national egg shortage" *RNZ News* (online ed, New Zealand, 14 April 2019) <https://www.rnz.co.nz/news/national/387046/demand-for-cage-free-eggs-contributes-to-national-egg-shortage>

65 Karoline Tuckey

66 Consumer NZ "Free-range claims" (24 October 2019) <https://www.consumer.org.nz/articles/free-range-claims/know-the-issue#article-free-range-credentials>

67 Countdown *The Countdown Trolley Report: A Look at New Zealand Grocery Trends* (2016) at 2. This report was based on data from their 2.8 million shopers each week and comprehensively reviewed grocery trends.

68 Interview with Mark Preece, Chairperson of the New Zealand Salmon Farmers Association (the author, 18 November 2019)

1.2.3 LIMITATIONS OF 'FREE RANGE' AND QUALITY ASSURANCE SCHEMES

Consumers may choose to purchase free-range products so as to ensure the animals or animal products they consume have been raised in conformity with high animal welfare standards. As discussed above, this appears to be an increasingly popular choice among New Zealand consumers. However, aside from the obvious limitation that free-range labelling does not apply to all animals and animal products, there are other issues associated with this descriptor.

There is currently no standard legal definition of what amounts to 'free-range'. For example, there is no national egg standard in New Zealand for free range (as has been developed in Australia).[69] Consumer New Zealand has argued this lack of definition means there is no guarantee that when eggs are labelled 'free-range', they will meet the expectations of consumers.[70] This is so even where the products are certified by a quality assurance scheme. In fact, a Consumer New Zealand study found that often consumers have low confidence in the accuracy of labels on eggs.[71]

Equally, it is suspected that meat labelled 'free-range' in New Zealand does not meet many consumers' expectations of what amounts to free-range.[72] In its latest survey, Consumer New Zealand found that consumers expected 'free-range' in relation to meat chickens to mean that the chickens spend the bulk of their time outdoors in small flocks of 500 – 1500 hens (this flock size is significant as it impacts on the number of chickens who are able to navigate their way to openings in the shelter so as to access the outdoors, and because unnaturally large flock sizes may be stressful for hens).[73] In reality however, the majority of free-range eggs come from flocks of at least 4000, with 'free-range' meat chickens being raised in flocks as large as 36,000 hens.[74] As organic farmer Ben Bostock has said, a company could have "over 30,000 chickens per shed and still claim they are free range."[75]

Similarly, NZPork's 'PigCare' scheme (monitored by AsureQuality) has come under criticism for promoting itself as a quality assurance scheme ensuring the 'highest standards of animal welfare', when in fact it only meets the minimum standards prescribed by the codes of welfare.[76] In 2015 SAFE made a complaint to the Commerce Commission regarding PigCare, submitting the PigCare scheme is misleading to consumers; that it attempts to define PigCare as an 'independent' scheme when it was in fact commissioned by NZPork; and that it gives businesses using the PigCare label an unfair market advantage.[77] The Commerce Commission issued a compliance notice to the NZ Pork Board in response to the complaint, having concluded that the label risked misleading consumers.

There have been numerous prosecutions under the Fair Trading Act 1986 and the Crimes Act 1961 in relation to producers falsely marketing their produce as free-range,[78] with millions of eggs in New Zealand

69 Australian Competition & Consumer Commission "ACCC releases guidelines on free range egg standard" (6 February 2018) <https://www.accc.gov.au/media-release/accc-releases-guidance-on-free-range-egg-standard>

70 Consumer "Free-range eggs" (6 July 2017) <https://www.consumer.org.nz/articles/free-range-eggs>

71 Consumer, above n 70 and Consumer, above n 66

72 Gerard Hutching "Free range meat chicken claims fail to stack up" *Stuff* (online ed, New Zealand, 25 October 2018) at <https://www.stuff.co.nz/business/farming/108078123/free-range-meat-chicken-claims-fail-to-stack-up>

73 SAFE "Layer Hen Facts" <https://www.safe.org.nz/layer-hen-facts>

74 Consumer, above n 66

75 Hutching, above n 72

76 SAFE "PigCare misleading consumers" <https://www.safe.org.nz/pigcare-misleading-consumers>

77 SAFE, "Complaint regarding NZPork's PigCare Accredited Scheme" (10 August 2015)

78 It is an offence under the Fair Trading Act 1986 to make false, misleading or deceptive claims in relation to a product. Additionally, falsely marketing a product as free-range can lead to charges under the Crimes Act 1961 for obtaining by deception.

having been falsely labelled as free-range.[79] There is a concern that these kinds of practices are common in the industry,[80] especially given the lack of proactive monitoring and enforcement of free-range egg labelling.

QUALITY ASSURANCE SCHEMES

Quality assurance schemes such as BioGro, AsureQuality, or the RNZSPCA Tick aim to provide consumers with added confidence that the products they consume live up to a certain standard, such as free range. However, there are also issues associated with these schemes. In particular, they are not regulated and there is the potential for them to be inconsistent in their content and scope. For example, the Chief Scientific Officer of the RNZSPCA, Dr Arnja Dale, has stated in relation to meat chickens that she would like to see "fewer than 30kg of chickens per square metre at all times."[81] In contrast, the Code of Welfare (Meat Chickens) 2018 provides for a minimum standard of 38kg per m^2 and a recommended best practice of 30kg per m^2.[82] However, as Michael Brooks of the PIANZ has pointed out, "the SPCA itself does not follow its own principle, since it accredits some companies which keep chickens at a stocking rate of 34kg per square metre."[83]

Having consistent codes of welfare and regulations with high animal welfare standards are important for ensuring that the physical, health and behavioural needs of all animals are met – this cannot be achieved through the use of quality assurance schemes alone.

1.2.4 FARMERS' AWARENESS OF THE CODES OF WELFARE AND REGULATIONS

This report also identifies as a concern the extent to which farmers are actually aware of, and read, the codes of welfare and regulations as part of their day-to-day practice.

While many farmers may be aware of the outcomes expected by the codes of welfare and regulations as a result of the training or information provided by industry organisations, it is less likely that farmers have read the codes of welfare and regulations firsthand. For example, Julie Geange of Federated Farmers stated that while farmers are aware that codes of welfare exist:[84]

> …a lot of it is handled by word of mouth…do I think that farmers have read [the codes of welfare] cover to cover? Probably not. But they're more than aware that they are around and they do follow what the codes offer.

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79 For example, in 2014, egg producer John Garnett was sentenced to home detention for falsely selling around 2.47 million eggs that he claimed were free range. Garnett was estimated to have made around one million dollars off these eggs. (*Commerce Commission v John Garnett* DC Whangarei CRI-2014-088-000695, 5 August 2014,<https://comcom.govt.nz/__data/assets/pdf_file/0025/68470/Commerce-Commission-v-John-Garnett-Judgment-5-August-2014.pdf>. Similarly, millions of caged eggs were marketed as free range under the Palace Poultry label prior to 2017, leading to an investigation by the Serious Fraud Office (Melanie Reid and Morgan Tait "Millions of caged eggs sold as free range in NZ" Newsroom (online ed, New Zealand, 13 March 2017) <https://www.newsroom.co.nz/2017/03/12/8521/millions-of-caged-eggs-sold-as-free-range-in-nz-supermarkets>). This investigation was closed in February 2018 on the basis that the evidential standard for criminal charges wasn't met. This is outlined in a letter from the Serious Fraud Office dated 5 March 2020.
An investigation was also conducted by the Commerce Commission into Gold Chick Poultry Farm in 2017, with the owner of this farm due to be sentenced on 26 March 2020 (Commerce Commission "Commission charges "free range" egg farmer" (30 August 2018) <https://comcom.govt.nz/case-register/case-register-entries/xue-frank-chen/media/commission-charges-free-range-egg-farmer>).

80 *Commerce Commission v John Garnett*, above n 79. Garnett stated in his defence that such practices are widespread. Similarly, in response to the 2001 case *Commerce Commission v Weedons Poultry Farm Ltd* DC Christchurch CRN 1009004163, 15 March 2001, free range egg producer Rob Darby of Free Range Egg and Poultry asserted that the problem is widespread and that "the public need to be made aware that a lot of the free range eggs they're buying aren't genuine free range" TVNZ "Hefty fine for egg scam" (15 March 2001) <http://tvnz.co.nz/content/32979/2591764/article.html>).

81 Hutching, above n 21

82 Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 10(b) (Stocking Densities) at 15; Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 10 (Stocking Densities), Recommended Best Practice (a) at 16

83 Hutching, above n 21

84 Interview with Julie Geange, above n 20

Similarly, Shane Kelly of Ngāi Tahu Farming stated:[85]

> I think, if I was really honest, farmers consciously wouldn't be aware of the animal welfare code but they will be doing those things naturally, 90% of them…we just don't have a conscious awareness of it…

Mark Preece of New Zealand Salmon Farmers Association considered that the Code of Welfare (Commercial Slaughter) 2018 is not viewed as a part of the day-to-day operations of fish farming (although he noted that the requirements outlined in this code are standard industry practice).[86] And Jenny Jago of DairyNZ stated:[87]

> …most farmers are aware of [the codes of welfare] although they probably couldn't quote you on each of however many minimum standards [there are] but they're aware of the outcomes that are sought.

She considered that farmers' awareness of the content of the codes was due to DairyNZ incorporating minimum standards and recommended best practice from the codes of welfare into the material they provide to farmers, which has been "translated" so as to make practical sense to farmers.[88]

While the provision of such information from industry groups in a "user friendly" format is welcome, there is a risk that important information may be missed or "lost in translation". This was demonstrated recently in relation to winter grazing of dairy cattle. The code of welfare for dairy cattle requires dairy cattle to have access to water;[89] sufficient food;[90] the means to minimise the effects of adverse weather;[91] and to lie and rest comfortably for sufficient periods to meet their behavioural needs.[92] Such standards should, in theory, prevent dairy cattle from ever having to live for extended periods in wet, muddy and unsanitary conditions without access to sufficient food and water. Despite this, the Winter Grazing Taskforce constituted by MPI in 2019 found that some winter-grazing dairy cattle were living in unsatisfactory conditions and that:[93]

> …there is not an agreed set of standards among farmers for good animal welfare practice, and what some consider good practice is still exposing animals to poor welfare states and is completely unacceptable to the public from an animal welfare perspective.

The potential for farmers to be insufficiently familiar with codes of welfare and regulations is exacerbated by the absence of any requirement in the Act, codes or regulations that farmers be familiar with their provisions, or any requirement for farmers to keep a copy of the codes of welfare or regulations on site at all times. While this is sometimes included as an example indicator of a minimum standard in a code of welfare,[94] it would be more suitable to include this as a minimum standard so that it is required of all farmers in relation to codes of welfare. Similarly, a regulation could be promulgated to this effect.

85 Interview with Shane Kelly, above n 37
86 Interview with Mark Preece, above n 68
87 Interview with Jenny Jago, above n 3
88 Interview with Jenny Jago, above n 3
89 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 5 at 10
90 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 2 at 8
91 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 7 at 13
92 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 6 at 11
93 Winter Grazing Taskforce, above n 1, at 5
94 For example, Minimum Standard 1 of the Code of Welfare (Pigs) 2018 includes as an example indicator that "Stock handlers are familiar with the minimum standards listed in this Code and a copy of the minimum standards is available on site at all times."

MPI recently conducted a survey in relation to the codes of welfare asking where participants primarily accessed the codes. While a minority of participants accessed printed copies of the codes or accessed the codes online, the vast majority of those surveyed accessed the codes of welfare through other (unspecified) means, as outlined at Figure 1. We note the raw data relating to this graph was not readily available, hence we are unable to provide specific numbers or percentages to clarify these findings further.[95] Unhelpfully, the colours in the graph are also somewhat mismatched.

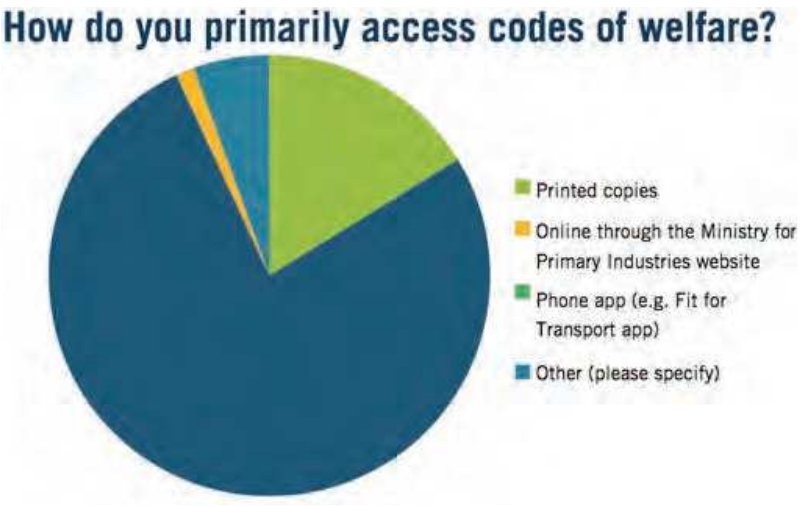


Figure 1. Codes of Welfare Survey[96]

Regardless, in relation to these findings MPI noted that "[access] to and awareness of animal welfare standards was commonly reported as a problem."[97] As Shane Kelly of Ngāi Tahu Farming stated, "the flow of information could be done a little better",[98] with the legal requirements simplified and coupled with visual aids. Where farmers are not reading the codes of welfare, MPI considered that:[99]

> NAWAC should partner with groups to promote animal welfare information – if people are not reading the full codes, this may be acceptable as long as they are still getting the correct information in another way.

This information could be provided through animal health plans, such as those developed and reviewed annually by Ngāi Tahu Farming alongside their vets,[100] or from industry organisations such as DairyNZ, Federated Farmers and PIANZ/EPF. However, this again leads to a risk that it is unclear in what form exactly the codes are being reviewed by farmers; how regularly they are being reviewed; and how accurate the content is that farmers are receiving. Additionally, some farmers may have better access to information than others - as Shane Kelly identified, while large corporate bodies will:[101]

> …be all over it because it's easy and they'll have people in offices that take those roles and ensure that it happens…but for a mum and dad farmer it's a very different world that they operate in and I think that how you engage with those is really important.

95 Marie McAninch "Codes of Welfare Survey" in *Welfare Pulse* (Ministry For Primary Industries, Issue 26, October 2018) at 3
96 At 3
97 At 3
98 Interview with Shane Kelly, above n 37
99 McAninch, above n 95, at 3
100 Interview with Shane Kelly, above n 37
101 Interview with Shane Kelly

An alternative would be to require as a minimum standard in each relevant code, or alternatively in a regulation, that farmers have copies of the applicable codes of welfare and regulations on site, and to make the substance of the codes and regulations available in a form that is readily understandable and memorable. For example, PIANZ and EPF currently require farmers to have a copy of the code of welfare for meat chickens or layer hens on site and these are provided to farmers in the form of an A3 poster that is easily legible and understandable. We recommend that all industry organisations include this as a mandatory policy, in order to ensure that farmers are aware of and familiar with the codes and regulations; that the information outlined in the codes and regulations is provided to farmers in a form that is legible and easily understandable; and to assist in ensuring that the codes and regulations are implemented in practice.

1.3 METHODOLOGY

We adopted a rigorous methodology in this report that combined formal qualitative interviews with traditional legal research methods.

First, we adopted a traditional doctrinal research methodology. This involved analysing the Act, the codes of welfare and regulations; reviewing NAWAC's reports in relation to the codes; reviewing relevant literature produced by NAWAC and MPI; reviewing the case law involving farmed animal welfare offending; reviewing academic literature and scientific studies; and analysing the regulation of farmed animal welfare in overseas jurisdictions.

Secondly, we sought to put the law into its social, economic and political context by engaging in semi-structured qualitative interviews with relevant stakeholders via Skype. These stakeholders included the following:

- Michael Brooks of PIANZ, EPF and the New Zealand Feed Manufacturers Association.
    - PIANZ is a trade association for processors of poultry, including chicken, turkey, duck, pheasant and quail consisting of Tegal, Ingham, Turks, Briggs and a number of smaller operators. The board of PIANZ are the CEOs of the four larger companies, with farmers themselves being associate members of PIANZ.[102]
    - The EPF is a separate board, for which Mr Brooks acts as a secretary on a contract basis. The EPF represents all commercial egg farmers, being generally anyone with 100 birds or more.[103]
    - The New Zealand Feed Manufacturers Association represents the interests of almost all the animal feed manufacturing companies in New Zealand.[104]
- Kerry Gray (Policy Adviser, Dairy) and Julie Geange (Policy Adviser, Meat and Wool and Animal Welfare) of Federated Farmers. Federated Farmers is an independent rural advocacy organisation with industry groups covering the specific interests of arable, dairy, goats, high country, meat and wool and rural butchers.[105] It currently has about 6,000 members.[106]
- Jenny Jago, Strategy and Investment Leader Farm Performance at DairyNZ. DairyNZ is an industry organisation that represents all New Zealand dairy farmers and invests in "on-farm tools, science,

102 "Associate membership is a subset of PIANZ. They get statistics, I communicate with that group and speak to them in meetings they organise to keep them updated on industry wide matters. The farmers meet regularly as a group with their company." Email from Michael Brooks of PIANZ and EPF, 7 February 2020

103 Interview with Michael Brooks, above n 19

104 New Zealand Feed Manufacturers Association "Welcome to the NZFMA" <https://nzfma.org.nz/>

105 Federated Farmers of New Zealand "Industry Policy" <https://www.fedfarm.org.nz/FFPublic/Policy2/Industry/Industry_Policy.aspx>

106 Interview with Kerry Gray, above n 36

resources and support and advocacy to ensure farmers have a profitable, sustainable and competitive future."[107]

- Shane Kelly, General Manager of Ngāi Tahu Farming from 2015 – 2019. Ngāi Tahu Farming consists of 2,400 ha of irrigated dairy farms, broken down into eight farms of varying size. These farms each milk between 850 to 1,100 cows (being 8,000 dairy cattle across all farms in total). The organisation is also involved in beef cattle, wool farming and forestry.[108]
- Mark Preece, Chairperson of the New Zealand Salmon Farmers Association. The Association represents six out of the eight salmon farms in New Zealand (being New Zealand King Salmon, Sanford, Mt Cook, Akaroa, High Country Salmon and Hook Aquaculture).[109]
- Hans Kriek, former Ambassador for Save Animals From Exploitation (**SAFE**).
- Kate Littin, Manager Animal Welfare of the Ministry for Primary Industries. Littin manages "a team of people who support two Ministerial advisory committees, provide national coordination of animal welfare emergency planning and services, and the Safeguarding our Animals, Safeguarding our Reputation programme."[110] Littin did not engage with us in a face-to-face interview via Skype but requested that we send through written questions for her to answer. Generalised answers to these were provided via email.
- Jono Frew of Natural Performance, a company founded to provide advice and assistance to farmers to implement regenerative farming strategies on their farms.
- Naya Brangenberg of free-range pork farm Longbush Pork. Brangenberg also has 10 years experience with MPI, three of these being as an animal welfare inspector.
- We also requested an interview with NZPork however this request was rejected.[111]

In undertaking these semi-structured, qualitative interviews, we adopted a formal interview process. Our questions were designed with the assistance of our Methods Advisor, Dr Bridgette Toy-Cronin (Director of the Legal Issues Centre at the University of Otago). Dr Toy-Cronin assisted in developing a set of questions that were open-ended; structured; finely grained; consistent between stakeholders; defined in scope; and which acknowledged both our own bias and the bias of the interviewee in question. This approach involved acknowledging the context of our interviewees and seeking to understand their perspective, and remaining neutral and non-judgmental throughout the interview. In adopting this methodology, we aimed to ensure an empirical qualitative approach, to remain open-ended in our research and to understand the "law in action" i.e. how it currently applies practice, and how it may be improved in practice.

Most stakeholders engaged with us fully and openly in the form of Skype interviews. The exceptions to this were NZ Pork, which refused to be interviewed, and MPI. Initially, Kate Littin of MPI agreed to a Skype interview. She subsequently did not wish to engage in this and stated that she would respond to our questions in writing. Obtaining these responses was somewhat challenging, with numerous calls and reminder emails being sent through to Littin to obtain her answers.[112] Littin subsequently responded to our request, however these answers were not in direct response to the questions we sent through and provided only very general information on the work of MPI and NAWAC in relation to animal welfare, most

107 Dairy NZ "Investment" <https://www.dairynz.co.nz/about-us/how-we-operate/industry-good-and-the-levy/>

108 Interview with Shane Kelly, above n 37

109 Interview with Mark Preece, above n 68. The other farms are Anatoki Salmon and Rengarenga café.

110 Email from Kate Littin (Manager of Animal Welfare at the Ministry for Primary Industries) to the author regarding this report (4 March 2020)

111 On the *grounds of the judicial review proceedings instigated by the NZALA and SAFE in 2020 as regards farrowing crates.*

112 Follow-up emails were sent to Kate Littin on 4 November 2019, 25 November 2019, 2 December 2019, 14 February 2020, 24 February 2020, in addition to numerous calls.

of which was already publicly available.[113] We sent through a revised list of questions in an attempt to obtain more direct responses,[114] however, Littin's response to these was similarly general in nature; did not respond to most of our questions directly;[115] and for the most part provided us with information that is already publicly available[116] We consider the manner in which MPI has responded concerning as it did not reflect a willingness to openly and transparently engage on the subject of animal welfare law and policy. This was in marked contrast to other of our interviewees, with animal advocacy organisation SAFE and industry stakeholders having generously provided their time in engaging with us face-to-face through Skype and in answering many follow-up questions via email.

SITE VISITS

We arranged site visits to a number of farms in order to see farming practices in person. This included a dairy cattle farm north of Oamaru, which we arranged through a contact independent of this research. Michael Brooks of PIANZ arranged for us to visit a meat chicken farm in Christchurch. We also hoped to visit a fish farm in Twizel, with this visit being arranged by Mark Preece of the New Zealand Salmon Farmers Association. Unfortunately this was unable to take place due to New Zealand being in lockdown as a result of Covid-19.

It was also not possible to arrange a visit to a layer hen farm due to a recent outbreak of Infectious Bursal Disease, and because "Many layer farmers (and meat chicken farmers) are very upset by what they see as unfair commentary on their farming practices and are very loath to agree to visits."[117] Nor were we able

113 Email from Kate Littin (Manager of Animal Welfare at the Ministry for Primary Industries) to the author regarding this report (19 December 2019)

114 Kate Littin, above n 110

115 For instance, our revised set of questions were not directly responded to. These included the following (email from the author to Kate Littin (Manager of Animal Welfare at the Ministry for Primary Industries) to the author regarding this report (4 March 2020):
- What does MPI consider are the most pressing animal welfare issues in relation to dairy cattle, layer hens, meat chickens, pigs and fish?
- In relation to animal welfare, MPI and NAWAC sit at the intersection of numerous interests (including industry and activist interests). How do you see MPI and NAWAC managing or balancing these different interests, for example in the establishment of the Codes of Welfare?
- Do you think that farmers are generally aware of the Codes and incorporate them into their day-to-day practices?
- In the view of MPI, what role do industry organisations such as Federated Farmers, Poultry Industry Association of New Zealand, the Egg Producers Association, DairyNZ and others have to play in regards to animal welfare? And what role do animal welfare organisations such as SAFE have to play? NAWAC is required to consider the scientific knowledge available on a given animal welfare issue in its establishment of the Codes of Welfare.
- In your view, how does NAWAC ensure that it reviews the most recent, and most relevant, science regarding animal welfare and the health, physical and behavioural needs of animals?
- What methodological process does it undertake in reviewing the relevant science and how does it ensure that all the relevant literature is reviewed?
- An industry group approaches NAWAC with a draft code of welfare for fish farming. Can you comment on how NAWAC ensures that the Code is established in accordance with good practice and best available scientific knowledge such that the Code is not biased towards that industry group's interests?
- MPI identified that stocking densities for layer hens and meat chickens would be reviewed as part of its establishing new regulations in regards to animal welfare (see RIS 2017). This took place in regards to layer hens (Regulation 21) but not in relation to meat chickens – what were the reasons for this? Are any in development for meat chickens and if so what are they?
- In 2017 NAWAC released a report on the animal welfare issues associated with selective breeding. What work is MPI currently doing to address the concerns NAWAC identified in this area?
- NAWAC identified lameness in meat chickens due to high growth rates as an area of concern (at Minimum Standard No 14 of the Code) and stated in the Report to this Code (at [21](a)) that an Animal Welfare (Meat Chicken Breeders) Code of Welfare is in development to address this. Did this ever go any further?
- We understand from conversations with PIANZ/EPF that MPI have announced that the Codes of Welfare for layer hens and meat chickens are to be reviewed. Can you tell us what particular aspects might be reviewed?
- The current provisions in the Code of Welfare (Commercial Slaughter) 2018 do not apply to the slaughter of fish caught in the wild. Additionally, the provisions of the Act exempt fishing operations that catch fish in the wild from the Act's welfare provisions – meaning that these fish can be caught and killed in a manner that causes them to suffer unreasonable or unnecessary pain or distress. Has MPI identified this has an animal welfare issue that needs to be addressed?

116 For instance, Littin linked us to issues of Welfare Pulse (an MPI publication on animal welfare matters); the Framework for Action on Animal Welfare; the National Animal Welfare Strategy; the Safeguarding our Animals, Safeguarding our Reputation programme; to information about NAWAC on MPI's website. All of these documents are already publicly available. Kate Littin, n 113

117 Email from Michael Brooks (Executive Director of PIANZ and EPF) to the author regarding follow-up questions from our interview on 11 November 2019 (January 16 2020)

to set up a site visit to a pig farm, with NZPork attributing this to African swine fever, stating that due to "the high biosecurity threat we are currently under… no non-essential visitors are being granted access on farms."[118] However, free-range pig farmer Naya Brangenberg questioned this. She stated that the industry uses "on-farm biosecurity as a means of trying to hide." And that there "are definitely ways you can get around bio-security to get people onto farms and talking to farmers."[119]

OFFICIAL INFORMATION ACT REQUESTS

We made a number of requests to MPI under the Official Information Act 1982:

- The first of these, made on 9 August 2019, related to communications between MPI and industry organisations in relation to the codes of welfare for meat chickens, layer hens, pigs and dairy cattle. This request was refused by MPI in a letter dated 2 October 2019 on the basis of the significant volume of communications they would be required to search for and the difficulty of obtaining and collating these. A second request was made on 7 October 2019 refining the terms of the search. This request was also refused.
- We made a request on 24 February 2020 regarding research conducted by MPI on the detrimental effects of using fast-growing broiler breeds on meat chicken health and welfare; what actions MPI plan to take on this issue; and if MPI plans to take no action, then why are they taking no action. MPI filed for an extension regarding this on 23 March 2020. On 17 April 2020, MPI sent us a further letter with links to the Code of Welfare (Meat Chickens) 2018 and to NAWAC's publicly available 2017 report on selective breeding. No other information was provided.
- We made a request on 24 February regarding any documents which discuss the operation of s 183A of the Act (this is the section whereby regulations can be made under the Act, and which requires such regulations to be phased out in 10-15 years where they do not fulfil the obligations of the Act); any practices that might be required to be the subject of regulations promulgated in reliance on s 183A; and any practices that are inconsistent or potentially inconsistent with the Animal Welfare Act 1999 in the codes of welfare for dairy cattle, pigs, meat chickens and layer hens. We clarified this on 13 March and requested 1) full versions of the assessments for the layer hen, pig, dairy cattle and meat chicken codes of welfare that came out of the February 2015 meeting of the working group wherein MPI undertook a process to identify what matters would be appropriate to be considered for regulations (specifically identifying whether there were existing activities that were disallowed or transitional requirements within codes of welfare) and 2) any further documents or correspondence referring to practices that might be the subject of regulations. MPI requested an extension of no later than 30 June. We requested that our first request above be sent through earlier, as this pertained to specific and readily ascertainable and identifiable documents. We received this information on 2 July 2020. We did not receive a response to our second request.
- We made a request on 16 March 2020 to obtain a full set of NAWAC's meeting minutes. Clarification of this request was requested by MPI on 19 March 2020 and 24 March 2020. In response, we requested NAWAC's meeting minutes that refer to the codes of welfare for meat chickens, layer hens, pigs and dairy cattle; the lack of a code of welfare for fish; and the development of a potential code of welfare for fish dating back to 2015. A further request for an extension was made by MPI on 14 April 2020 for no later than 25 June. We received NAWAC's meeting minutes from 14 November 2012 to 04 November 2016 on 22 May 2020.
- We made a request on 1 April 2020 requesting copies of two internal reports cited in NAWAC's report on the Code of Welfare (Meat Chickens) 2018.[120] These reports were sent through to us on 4 May 2020.

118 Email from NZPork to the author regarding a potential site visit to a pig farm in New Zealand (2 December 2019)

119 Interview with Naya Brangenberg, Farmer at Longbush Pork (the author, 24 April 2020)

120 C.S. Bagshaw and L.R. Matthews Broiler welfare - a review of latest research and projects in progress internationally (Ministry of Agriculture and Forestry, October 2001); C.S. Bagshaw, L.R. Matthews, and A. Rogers Key indicators of poultry welfare in New Zealand (Ministry of Agriculture and Forestry, March 2006).

1.4 SCOPE AND LIMITATIONS

We have undertaken a fine-grained analysis of the relevant codes of welfare and regulations in order to identify how the codes and regulations function and how they may be improved. However, to make the project manageable we elected to focus specifically on the codes of welfare and regulations for dairy cattle, pigs, meat chickens and layer hens, and on the lack of a code of welfare for fish. Arguably these are the most contentious cohorts of production animals in terms of animal welfare impacts.

This does mean that the scope of our research is limited to the codes and regulations we have elected to examine. However, a number of the issues we have identified with these animals and their respective codes of welfare (or lack thereof) and regulations are relevant to other animals. For example, we are critical of the processes by which the codes and regulations have been established, and this critique applies much more widely to all the codes of welfare and regulations promulgated under the Act. Additionally, many of the issues we identified are likely to apply to farmed animals across the board, particularly in relation to their ability to exhibit their normal behaviours. This is arguably one of the most important requirements of the Act – but also the requirement most commonly not met in practice.

There are separate codes of welfare and regulations relating to transport and slaughter. We have not examined these in great depth and thus these are outside the scope of our report. The exception to this is fish, which we discuss in relation to the Code of Welfare (Slaughter) 2018.

This report addresses issues relating to selection pressure, being the practice of selecting animals for maximum productivity (e.g. meat, egg or milk production or litter size). Selection pressures are a major cause of welfare problems and systemic to animal farming. In 2017 NAWAC released a report on selective breeding practices, which provided recommendations to industry.[121] However, no specific code of welfare or regulations regarding selection pressures or harmful genetic manipulation and selection have been promulgated. We consider this a significant omission given the welfare issues involved. While this report touches upon issues relating to selection pressure, it is likely that much more work is required in this area.

Live export is an additional welfare issue relating to farmed animals. Restrictions in relation to live export are outlined in the Animal Welfare (Export of Livestock for Slaughter) Regulations 2016. These regulations have effectively prevented the live export of animals for slaughter. However, there are no similar restrictions on the live export of animals for breeding.[122] This topic sits outside the scope of this report.

This report does not consider any matters relating to compliance, monitoring and enforcement of the Act, codes and regulations (which are enforced primarily by MPI and the RNZSPCA). These are major issues in relation to animal welfare in New Zealand. They were thoroughly canvassed in a 2019 report by Rodriguez Ferrere *et al*. 'Animal Welfare in New Zealand: Oversight, Compliance and Enforcement.'[123] This report found that prosecutions under the Act are complaints driven rather than resulting from proactive monitoring and enforcement – as MPI recognised in its *Safeguarding Our Animals, Safeguarding*

121 National Animal Welfare Advisory Committee NAWAC *Opinion on animal welfare issues associated with selective breeding* (Ministry for Primary Industries, March 2017)

122 "This is an increasingly prevalent practice in New Zealand: MPI statistics show that in 2018, 17,319 live cattle, 2,993 horses, 239 sheep, and 2.8 million one-day-old chicks were exported from New Zealand. Most recently, 5,400 cows were shipped to China in early August 2019, despite public protest and opposition from the New Zealand Green Party. Similar shipments have had disastrous welfare consequences in the past. For example, in 2015, approximately 45,000 sheep and 3,000 cows were exported from New Zealand to Mexico, purportedly for breeding purposes. Only one veterinarian was on board the ship during this fifteen-day voyage, and approximately 200 animals died before reaching Mexico." Danielle Duffield, above n 46, at 34.

123 Marcelo Rodriguez Ferrere, Mike King and Levi Mros Larsen *Animal Welfare in New Zealand: Oversight, Compliance and Enforcement* (University of Otago, 2019)

Our Reputation document, it has "limited or no information available about animal welfare compliance on the 97.5 percent of farms for which no complaint is received."[124] Additionally, "Less than 1 percent of complaints received by either [MPI or the RNZSPCA] are prosecuted."[125] The low levels of enforcement identified in this report are linked to an insufficient allocation of funding to animal welfare enforcement. Just 1.6% of MPI's total budget for the 2018/2019 year was dedicated for this purpose in relation to farmed animal welfare. The funding covered a total of 22 MPI Animal Welfare Inspectors "for more than 150 million agricultural animals… in 2018 those resources allowed MPI to recommend prosecution in 26 cases (or two percent) of the 1,190 complaints it received."[126] As stated, we do not address any of these enforcement issues in depth, however we note the research by Rodriguez Ferrere *et al*. highlights wider contextual issues, which are critical to farmed animal welfare law in New Zealand.

A further significant limitation to this research is that it does not extend to the importation of meat from other countries. For example, over 60% of the pork consumed in New Zealand is imported from around 25 different countries. Similarly, in 2019 New Zealand imported 417,393 kilograms of fresh fish; 4,928,946 kilograms of processed chicken imports; 4,826,360 kilograms of processed egg imports; 22,104,462 kilograms of processed fish imports; and 16,107,965 kilograms of dairy products.[127] Many of these imports are from countries with lower welfare conditions than New Zealand, although this is not true in all instances (with a number of European Union countries having higher standards than our own). In fact, animal welfare organisations such as SAFE believe there should be no importation of pork into New Zealand, both because of lower animal welfare standards in some of these exporting countries, and to prevent disease outbreaks within the animal population (e.g. in light of the swine fever outbreaks in Asia in recent times).[128] However international trade rules make it difficult for New Zealand to implement barriers to imports on the basis of animal welfare concerns.[129] This is extremely problematic as such imports prevent New Zealand consumers from being confident that their meat has been responsibly farmed. They also undercut New Zealand-based producers, who face higher production costs due to higher animal welfare standards, which are difficult to pass on to consumers due to the availability of cheaper imports. As NAWAC has recognised, imports in this way "limit the price increase [available to domestic producers] so that producers bear most of the cost."[130] Regulations for country-of-origin labelling are in the process of being developed, which may help to alleviate the issues associated with such imports, as New Zealanders will more easily be able to identify where meat

124 At 100
125 At 2
126 At 114 and 11
127 Phone calls with the Trades team at Stats New Zealand on February 26 2020 and 10 March 2020
128 Interview with Hans Kriek, above n 15
129 Ministry of Agriculture and Forestry, above n 39, at 6, "International trade rules do not allow countries to discriminate against trade in products on the basis of animal welfare standards in the exporting country."
130 National Animal Welfare Advisory Committee *Animal Welfare (Pigs) Code of Welfare 2010 Report* at 28

products come from and will (hopefully) choose domestic products where these are associated with higher animal welfare standards. However, these regulations do not adequately label certain imported products such as processed pork, chicken and fish (including marinated or flavour enhanced meats, crumbed fish, meatballs, pulled pork, luncheon sausage, sausages, salami and marinated, seasoned or injected pork).[131] At present, the reality of imported meat from countries with lower animal welfare standards than New Zealand places a significant limitation on the potential efficacy of amendments to the Act, codes of welfare and regulations. This gap is also in need of redress.

Finally, an area for further research across all farmed animals relates to regenerative farming practices. This approach to agriculture involves conserving and rehabilitating food and farming systems, with an emphasis on topsoil regeneration, increasing biodiversity, improving the water cycle and tackling climate change.[132] This is particularly relevant for farmed animals in terms of the feed they consume. While each of the codes of welfare for pigs, meat chickens, layer hens and dairy cattle require the provision of adequate feed,[133] they do not specify what feed needs to consist of exactly. Michael Brooks of the New Zealand Feed Manufacturers Association stated there are quality assurance processes around this[134] and that within the context of poultry, nutritionists are employed to prepare their diets.[135] However, some commentators have argued that farmed animal feed is insufficiently diverse and that this leads to health issues in farmed animals, which in turn leads to increased costs for farmers. For example, Jono Frew of Natural Performance Limited stated that current farming practices are not adequate and that regenerative farming aims to maximise nutrient diversity so as to have animals "full of vigour and vitality such that we don't need to treat them with a lot of the medicines that are a result of poor

131 Ministry of Business, Innovation and Employment *Exposure draft consultation: Consumer Information Standards (Origin of Food) Regulations 2019; Request for submissions* (December 2019) at 7. See also: Hilary Pearson "No sasuages or salami?! The country-of-origin regulations let pork eaters down" *The Spinoff* (online ed, New Zealand, 3 February 2020)

132 Regeneration International "What is Regenerative Agriculture?" (24 February 2017) <https://regenerationinternational.org/2017/02/24/what-is-regenerative-agriculture/>

133 In particular, they require that animals receive adequate quantities of food and nutrients to enable them to maintain good health; meet their physiological demands and minimise metabolic and nutritional disorders. Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 2(a) (Food and Water) at 8; Code of Welfare (Pigs) 2018, Minimum Standard No. 2(a) (Food) at 8; Code of Welfare (Layer Hens) 2018, Minimum Standard No. 2(a) (Food and Water) at 7; and Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 2(a) (Food) at 8

134 "The [New Zealand Feed Manufacturers Association] has a quality assurance scheme called FeedSafeNZ that sees mills independently audited by AsureQuality as to the manufacturing and blending processes and we encourage all non-grain ingredients e.g. amino acids, pre mixes, vitamins etc. to be from FIAAA accredited suppliers for higher standards." Email from Michael Brooks (Executive Director of New Zealand Feed Manufacturers Association) to the author regarding quality assurance processes around feed for meat chickens (7 February 2020)

135 "Poultry companies employ nutritionists to prepare their diets, which are manufactured to specifications by the animal feed companies. NZ poultry nutritionists are held in very high regard internationally for their expertise. Feed related disease is minimal in NZ (a factor in low mortality rate by world standards)." Email from Michael Brooks

nutrition."[136] Frew referred to his work with dairy farmers where they are "planting pastures with upwards of 30 species of plant"[137] as compared to one or two species (being rye grass and clover). Other approaches adopted by Natural Performance include farming different animals in the same space (such as sheep and cattle) and not weaning animals prematurely. As a result of such practices, Frew stated farmers are seeing big increases in productivity through being able to carry more stock and not having to spend time and resources "in animal handling and docking of tails, treatment of symptoms that come from taking an animal off its mother too young."[138] Other commentators have discussed the benefits of a regenerative farming approach,[139] as has the animal welfare organisation Compassion in World Farming.[140] Similarly, a team at Lincoln University in Canterbury recently found that where sheep have access to variety in their diet there is a 100 percent increase in growth, less impact on the environment (in terms of nitrogen excretion) and improved well-being for the animals.[141]

While an in-depth investigation of regenerative farming is outside the scope of this report, we flag this work here as such practices have the potential to improve animal health and welfare through the provision of alternative foods and other management practices, and could be worth considering were the codes of welfare and regulations to be reviewed. However, further research is required in this area.

136 Interview with Jono Frew, Owner of Natural Performance (the author, 1 December 2019). Frew is a former chemical agronomist who has previously managed a dairy farm. Natural Performance has been operating since early 2019 and has worked with farmers in dairy, arable, sheep, beef cattle, vegetable and chickens.

137 Interview with Jono Frew

138 Interview with Jono Frew

139 "Not only does this system of natural grazing aid the environment in terms of social restoration, biodiversity, pollinating insects, water quality and flood mitigation – but it also guarantees healthy lives for the animals, and they in turn produce meat that is healthy for us." Isabella Tree "If you want to save the world, veganism isn't the answer" *The Guardian* (online ed, United Kingdom, 25 August 2018)

140 For example, Compassion in World Farming released a report on this topic in the United Kingdom on 1 July 2017. Compassion in World Farming *Turning the Food System Round; The role of government in evolving to food system that is nourishing, sustainable, equitable and humane* (1 July 2019). Philip Lymbery, the Chief Executive of Compassion in World Farming similarly advocated for this in 2017, see Bibi van der Zee "Why factory farming is not just cruel – but also a threat to all life on the planet" *The Guardian* (online ed, United Kingdom, 4 October 2017).

141 "Sheep with a varied diet grew faster and produced less pollutants, new study funds" *TVNZ* (online ed, New Zealand, 27 October 2020).

1.5 BIAS

The NZALA acknowledges its own bias, being an organisation that was founded "to improve the welfare and lives of animals through the legal system."[142] We have taken care to recognise and minimise this bias, by our central focus on the standards legally prescribed by the Act, in particular the responsibility to meet the physical, health and behavioural needs of animals, and identifying where the codes and regulations fail to meet this standard. We have based our research on the latest scientific knowledge and engaged in a thorough consideration of the ethical implications of our research and our research methods.[143]

While our research makes some use of material from animal advocacy organisations, we have attempted to always review this material critically and have also referred to material from industry and Governmental sources, and consulted with a range of stakeholders including industry representatives and MPI. As Rodriguez Ferrere noted in regards to his 2019 report on compliance, monitoring and enforcement of animal law:[144]

> …it is difficult to find a source of information that is immune to accusations of bias from any stakeholder in the topic we discuss, whether that be animal advocacy organisations, or those with compliance and oversight functions…This supports a conclusion we reach in this report, which is that more independence is needed in our animal welfare protection system. One of the benefits of this would be the generation of information that is not readily accused of bias.

In chapter nine we similarly recommend the establishment of an independent entity to develop and enforce animal welfare law in New Zealand, partly for this reason.

142 New Zealand Animal Law Association <http://nzala.org/>

143 *We did this through utilising the forms drafted by the University of Otago for this process (this project could not get University of Otago Ethics approval as it sits outside the auspices of the University). We considered the potential ethical issues in depth through utilising these forms and reviewing our answers with Dr Toy-Cronin and with our supervisors, Danielle Duffield and Marcelo Rodriguez Ferrere.*

144 Ferrere, King and Larsen, above n 123, at 8.

"...MINIMUM STANDARDS IN A CODE OF WELFARE MUST NOW FULLY COMPLY WITH THE OBLIGATIONS IN THE ACT. ANY NON-COMPLIANCE WITH THE OBLIGATIONS IN THE ACT CAN ONLY BE AUTHORISED BY REGULATIONS...WHICH MUST CONTAIN SPECIFIC TIME FRAMES FOR NON-COMPLIANT PRACTICES TO BE TRANSITIONED OR PHASED OUT"

NEW ZEALAND HIGH COURT

CHAPTER 2 - THE LEGAL REGIME

2.1 INTRODUCTION

This chapter provides an overview of animal welfare legislation in New Zealand. Before examining specific codes of welfare and regulations, it is important to understand what the relevant legislation is; how it functions; and how the codes of welfare, the Animal Welfare Act 1999 and regulations intersect.

Particularly important, and worth flagging here, is the Amendment Act 2015. This Act repealed the former s 73(3), which had enabled MPI and the Minister to establish provisions that did not meet the obligations outlined in the Act in "exceptional circumstances". Now, such inconsistent provisions are required to be implemented by way of regulation under s 183A(2), and phased out within 10 – 15 years under s 183A(5) and s 183A(6).[145] As recently noted by the High Court in judicial review proceedings brought by the NZALA and SAFE:[146]

> …the removal of the "exceptional circumstances" exemption and the introduction of the regulation-making powers in the 2015 Amendment signified a shift in Parliament's tolerance for non-compliant welfare practices under the Act…. It is plain that Parliament's intention in passing the Bill into legislation was to ensure that non-compliant practices were to be time limited up to 10 years and ultimately phased out.

Unfortunately, such inconsistent practices have not been phased out in many instances. NZALA and SAFE's High Court proceeding provides one such example, with the Court having deemed the regulations and minimum standards relating to farrowing crates and sow stalls for pigs invalid and unlawful.[147] This case is discussed in more depth throughout this chapter, and at [5.2] and [5.3] where we specifically address the use of farrowing crates and sow stalls under the Code of Welfare (Pigs) 2018.

Finally, it is important to clarify the roles of MPI and NAWAC in regards to this regime. The Act is administered and enforced by MPI.[148] The Act also established NAWAC,[149] whose functions include advising the Minister on issues relating to welfare of animals; developing codes of welfare and recommending them to the Minister;[150] and providing animal welfare advice to the Minister on regulations to be made under the Act.[151] Issues associated with the roles of MPI and NAWAC and the processes by which the codes of welfare and regulations are established are considered in this chapter.

145 There is only one exception to this under s 183A(7) of the Animal Welfare Act, which states "if the Minister considers that requiring a practice to fully meet the obligations specified in [the Act]… would impose an unjustifiable limitation on the requirements of a religious or cultural practice, the Minister may recommend the making of regulations in reliance on subsection (2) for an indefinite period subject to review at 10-yearly intervals or shorter intervals specified in the regulations."

146 High Court (press release), above n 5, at [11] and [88]

147 *The New Zealand Animal Law Association v The Attorney General*, above n 4

148 The RNZSPCA also has enforcement powers in relation to companion animals. A Memorandum of Understanding between the RNZSPCA and MPI outlines that the former enforces companion animal welfare and the latter farmed animal welfare. (Memorandum of Understanding between The Ministry for Primary Industries (MPI) and The Royal New Zealand Society for the Prevention of Cruelty to Animals Incorporated (SPCA) [2019]). The police also have enforcement powers under the Act, but rarely use them in practice.

149 Animal Welfare Act 1999, s 56

150 Section 57

151 Ministry for Primary Industries "National Animal Welfare Advisory Committee" <https://www.mpi.govt.nz/protection-and-response/animal-welfare/national-animal-welfare-advisory-committee/>. As outlined in the Animal Welfare Act 1999, s 183A(10)

2.2 THE ANIMAL WELFARE ACT 1999

The Animal Welfare Act 1999 is the primary legislation regarding companion and farmed animal welfare in New Zealand. In many respects the Act is remarkably progressive. From its inception the Act provided for more than 40 offences, in contrast to its predecessor, which listed only a few specific crimes against animals. The Act provides far wider definition of 'animal' than its predecessor (the Animal Protection Act 1960), with the only animals excluded from the Act being insects.

Section 9 describes the purpose of Part I of the Act, being that persons who own or are in charge of animals must attend properly to their welfare. Section 10 obliges owners and persons in charge of animals to ensure that their "physical, health and behavioural needs" are met in accordance with good practice and scientific knowledge. These 'physical health and behavioural needs' are defined in s 4 to include the opportunity to display normal patterns of behaviour, as well as the provision of proper and sufficient food and water; adequate shelter; appropriate physical handling; and protection from, and rapid diagnosis of, injury and disease (this mirrors the 'five freedoms', with the Act being the first in the world to codify these).[152] This definition of 'physical, health and behavioural needs' recognises that animals have both physical needs (such as the need for food and water) and the need to express certain behaviours. These behaviours include the need to socialise; to express maternal behaviours (such as nest-building); the need to fly, walk, run or otherwise move; the need to play (in order to learn social skills and physical co-ordination); and more. The need to express these behaviours is deeply ingrained, with domesticated animals having inherited these needs from their wild ancestors.[153] While these needs may now be redundant on today's modern farms, subjectively they are still felt by animals to varying degrees of intensity, and the inability to express these behaviours has by now been well proven to cause animals suffering. As NAWAC's guidelines recognise:[154]

> Animals must be provided the opportunity to display normal patterns of behaviour …Because most domestic animals are constrained from exhibiting the full repertoire of behaviours that their wild counterparts might exhibit, minimum standards should deal with any priority behavioural requirements of the species…and how to avoid behavioural or physiological problems that may occur as the result of deprivation of the opportunity to express those behaviours.

152 These are freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury or disease; freedom to express normal behaviours; and freedom from fear and distress. Brambell , above n 11. The 'five freedoms' have been adopted by veterinarians as well as animal welfare organisations such as the RSPCA, the World Organisation for Animal Health and the American Society for the Prevention of Cruelty to Animals. The five freedoms have been updated as the five domains or provisions by Mellor et al.

153 Yuval Noah Harari "Industrial farming is one of the worst crimes in history" *The Guardian* (online ed, 25 Sept 2015)

154 National Animal Welfare Advisory Committee *Guidelines for Writing Codes of Welfare* (Ministry of Agriculture and Forestry, June 2009) at 11

Section 11 further provides for an obligation to alleviate pain or distress of ill or injured animals. Offences for failing to meet the ss 10 and 11 obligations are prescribed in s 12 of the Act, with the additional offence of killing an animal in such a manner that the animal suffers unreasonable or unnecessary pain or distress.[155] The obligations outlined at ss 10, 11 and 12 apply to owners and persons in charge of animals. In addition, s 29(a) provides for the offence of ill-treatment, which is defined in s 2 as:

> …causing the animal to suffer, by any act or omission, pain, or distress that in its kind or degree, or in its object, or in the circumstances in which it is inflicted, is unreasonable or unnecessary.

In contrast to similar offences contained in the Animal Protection Act 1960 that preceded the Act, ill-treatment under s 29(a) and the failure to meet the ss 10 and 11 obligations under s 12, do not require wilfulness or wantonness (i.e. intention). Rather, the offences are of strict liability, meaning that all that is required to commit an offence is a failure to take reasonable care to meet one's legal obligations.[156] Section 28 further provides for the offence of wilful ill-treatment and s 28A for the offence of reckless ill-treatment. Sections 29(a), 28 and 28A apply to everyone regardless of whether or not they are persons in charge of animals. There are a range of other specific offences in the Act.[157]

These provisions greatly expanded the obligations owed to animals by their owners and people in charge of them. They signalled a move away from a reactive approach to animal welfare (which simply imposed liability on those who were cruel to animals) to a preventative approach, imposing on owners and persons in charge of animals a positive duty to ensure the welfare of animals.[158]

155 Animal Welfare Act 1999, s 12(c)

156 Sections 13 and 30 confirm the strict liability nature of these offences.

157 Sections 29 (b) – (h)

158 Neil Wells and Marcelo Rodriguez Ferrere *Wells on Animal Law* (2nd ed, Thomson Reuters, Wellington, 2018) at 98. As a 2010 report from the then Ministry for Agriculture and Forestry recognised, "The philosophy of the new Act reflected a change of focus away from preventing cruelty to animals, to establishing a duty of care for people in charge of animals." Ministry of Agriculture and Forestry, above n 39, at 5

2.3 THE ANIMAL WELFARE AMENDMENT ACT (NO. 2) 2015

The Amendment Act 2015 implemented a range of significant changes.

First, it provided for significant new regulation-making powers,[159] designed to complement the codes of welfare and the Act by providing for regulations setting animal welfare standards or requirements (under s 183 – 183C), and prescribing offences that constitute infringement offences (under s 183(1)(h)).[160] A number of regulations have been promulgated so far.[161]

The Amendment Act 2015 also resulted in the total banning of cosmetic testing in New Zealand,[162] and incorporated into the Long Title of the Act legislative recognition of animal sentience.[163] MPI defines sentience on its website as "the ability to perceive or feel things."[164] Similarly, in its submission on the Animal Welfare Amendment Bill 2013 NAWAC defined sentience as "the ability to feel, or perceive, or be conscious, or have subjective experiences as distinct from the ability to reason."[165] Broom has defined sentience as "the ability to feel, perceive and experience", [166] aspects of which include "consciousness, memory and emotions". [167] These definitions imply that we need to consider how animals experience the world and their particular needs. Although only expressly recognised pursuant to the Amendment Act 2015, the notion of animal sentience underpins the purposes and corresponding protections provided by the Act.

159 Regulations under ss 183A – 183C may be made by the Governor-General on the recommendation of the Minister of Agriculture

160 Those who commit infringement offences can either be served with an infringement notice under s 162 or have a charging notice filed against them under s 14 of the Criminal Procedure Act. There are three categories of infringement offences, ranging from category 1 offences (highest penalty of 25k) to category 3 offences (maximum penalty of 5 years' imprisonment or a fine of 100k for an individual). The Amendment Act 2015 was established in part "to enable regulations to be made that would be directly enforceable through associated offences and penalties" (Ministry for Primary Industries, above n 41, at 3), with the regulations intended to address low to medium offending and to bridge a gap in enforcement that the codes of welfare were incapable of addressing. As MPI stated in its 2017 Regulatory Impact Statement: "Codes of welfare are not directly enforceable and do not have any associated offences or penalties for breach. This means that while high-end animal cruelty can be properly dealt with by prosecution under the Act, there is no simple and cost-effective way to address a significant range of low to medium level offending against animals" (Ministry for Primary Industries, above n 41, at 3).

161 A number of regulations have been promulgated so far. These include the Animal Welfare (Export of Livestock for Slaughter) Regulations 2016, which provide that the export of cattle, sheep, deer and goats for slaughter cannot occur unless approved by the Director-General of MPI. Further regulations include the Animal Welfare (Calves) Regulations 2016 and the Animal Welfare (Care and Procedures) Regulations 2018 - the former have since been repealed and incorporated into the latter.

162 Animal Welfare Act 1999, s 84A

163 The long-title of the Act states that it is an Act "to reform the law relating to the welfare of animals and the prevention of their ill-treatment… and, in particular… to recognise that animals are sentient."

164 Ministry for Primary Industries "Codes of welfare" <https://www.mpi.govt.nz/protection-and-response/animal-welfare/codes-of-welfare>

165 National Animal Welfare Advisory Committee "Submission to the Primary Production Committee on the Animal Welfare Amendment Bill 2013" at 5

166 Professor D.M. Broom "Considering animals' feelings: Précis of Sentience and Animal Welfare" (2016) 5 Animal Sentience at 1

167 At 1. Broom further stated "A sentient being is one that has some ability: to evaluate the actions of others in relation to itself and third parties, to remember some of its own actions and their consequences, to assess risks and benefits, to have some feelings, and to have some degree of awareness" at 2 – 3.

SIGNIFICANT LIMITATIONS ON PROVISIONS THAT DO NOT COMPLY WITH THE ACT

Perhaps the most important aspect of the Amendment Act 2015 is that it:

a) limited the circumstances in which provisions can be made that fail to meet the obligations under the Act; and

b) significantly circumscribed the ability of such provisions to continue indefinitely.

In particular, Parliament chose to repeal s 73(3), which had previously permitted practices that were non-compliant with the Act under "exceptional circumstances".[168] However, since the Amendment Act 2015, practices that are inconsistent with the Act now come under the new s 183A(2).

Section 183A(2) provides that regulations can be made that do not fully meet the obligations under the Act. However, s 183A(3) requires the Minister to be satisfied that:

a) Any adverse effects of a change from current practices to new practices have been considered and there are no feasible or practical alternatives currently available; and/or

b) That not to do so would result in an unreasonable impact on a particular industry sector within New Zealand, a sector of the public, or New Zealand's wider economy. In deciding whether any impact is unreasonable the Minister *must* have regard to the welfare of any affected animal under s 183A(4).

Section 183A(5) provides that any such regulations must provide for the regulations to be in force for a period of time that is:

a) reasonably necessary to enable a transition from current practice to a practice that fully meets the obligations under the Act; and

b) does not exceed 10 years, this period able to be extended for up to an additional five years under s 183A(6).

As the High Court recently recognised:[169]

> In 2015, Parliament signalled its intention to phase out non-compliant practices by repealing the 'exceptional circumstances' exemption and enacting regulation-making powers that prescribe time frames for transitioning from current non-compliant practices to practices that fully meet the obligations of the Act. Section 183A(2) was introduced for this purpose.

168 Animal Welfare Act 1999, s 73(3), revoked. Under the former s 73(4) NAWAC was able to take into account the feasibility and practicality of affecting a transition to new practices; the requirements of religious practices and/or cultural practices; and the economic effects of any such transition when creating provisions that were non-compliant with the Act.

169 *The New Zealand Animal Law Asscoation v The Attorney General*, above n 4

2.4 CODES OF WELFARE

Part 5 of the Act provides for the creation of codes of welfare, a form of delegated legislation under the Act.[170]

The current codes of welfare were issued by NAWAC. Under s 70(1) of the Act, the Minister, NAWAC, or any other person may prepare a draft code of welfare. Section 70(2) provides that draft codes must be forwarded to NAWAC for review, and NAWAC must then publicly notify the draft code if it is satisfied that, among other things, the draft complies with the Act, and that representatives of the persons likely to be affected by the draft have been consulted about it.[171] After public consultation, NAWAC considers whether to recommend the draft code to the Minister, having regard to the factors outlined under s 73(2). These factors include submissions made under s 71 and consultations undertaken by the Committee; good practice and scientific knowledge; available technology; and any other matters considered relevant by NAWAC. NAWAC can also take into consideration the practicality and economic impact of the code if relevant.[172]

Before recommending a draft code to the Minister under s 73(1) NAWAC must be satisfied that the proposed standards "are the minimum necessary to ensure that the purposes of [the] Act will be met."[173] This is of course to be expected, as it is a basic principle of the rule of law that delegated instruments should be consistent with their parent legislation. Section 73(3) enables NAWAC to take into account "practicality and economic impact, if relevant" when making a recommendation. However, "those factors cannot override the welfare considerations under the Act."[174]

Section 74(2) provides that NAWAC's recommendation to the Minister must be accompanied by a report setting out the reasons for NAWAC's recommendation, and the nature of any significant differences of opinion about a recommended code that have been shown in the submissions or within the Committee. We review NAWAC's reports in relation to the relevant codes in chapters four – seven. This is where NAWAC outlines the scientific literature it has reviewed in relation to a code of welfare.

The purpose of the codes is outlined in s 68 of the Act, which specifies that they relate to animals owned by or in the charge of any person, thereby excluding wild animals. Consequently, there are no codes for commercial, game or trout fishing or for hunting.

Compliance with a code of welfare operates as a defence to a breach of certain sections of the Act, including in relation to:

170 The Act defines these as 'disallowable instruments' (at s 79 for the purposes of the Legislation Act 2012), being delegated legislation that must be presented to the House and which can be disallowed by the House (New Zealand Parliament "Chapter 28 Delegated Legislation" https://www.parliament.nz/en/visit-and-learn/how-parliament-works/parliamentary-practice-in-new-zealand/chapter-28-delegated-legislation/).

171 Animal Welfare Act 1999, s 71

172 Section 73(3)

173 Section 73(1)(a)

174 *The New Zealand Animal Law Association v The Attorney General*, above n 4

- Section 12, which provides that it is an offence to breach ss 10 and 11 of the Act.[175]
- Sections 21(1)(b) (which relates to the restriction on performance of surgical procedures), 22(2) (which relates to transport of animals) or 23 (which relates to other offences in relation to the transport of animals).[176]
- Section 29(a), which relates to ill-treatment of animals.[177]

Conversely, the failure to meet a minimum standard in a code of welfare may be used as evidence to support a prosecution under the Act.[178]

MPI has explained that the codes were established separately from the Act "because with so many different types of animals and situations, it is impractical to include them all in the Act – it would make for lengthy and unwieldy legislation."[179] Additionally, MPI has noted that the codes allow for flexibility, as they can be "modified and improved as community expectations, good practice, scientific knowledge and technical advances allow."[180] The codes also allow minimum standards to be set by experts rather than by the courts, which have historically established standards of cruelty in relation to animal welfare. Thus, in theory, animals' needs are determined not by judicial interpretation, but based on scientific and expert information.

There are currently 19 codes of welfare in force, pertaining to circuses, cats, dairy cattle, deer, dogs, goats, horses and donkeys, layer hens, llamas and alpacas, meat chickens, ostriches and emus, painful husbandry procedures, pigs, rodeos, sheep and beef cattle, slaughter of animals, temporary housing of companion animals, transport of animals and zoos.[181]

2.4.1 GOOD PRACTICE AND SCIENTIFIC KNOWLEDGE

The requirements to consider good practice and scientific knowledge in the development of the codes at s 73(2)(b) mirrors ss 9 and 10 of the Act, which also require owners and persons in charge of animals to ensure that the physical, health and behavioural needs of animals are met in accordance with good practice and scientific knowledge.

NAWAC defines good practice as a:[182]

> …standard of care that has a general level of acceptance among knowledgeable practitioners and experts in the field; is based on good sense and sound judgement; is practical and thorough; has robust experiential or scientific foundations; and prevents unreasonable or unnecessary harm to, or promotes the interests of, the animals to which it is applied. Good practice also takes account of the evolution of attitudes about animals and their care.

NAWAC considers 'scientific knowledge' to mean "knowledge within animal-based scientific disciplines, especially those that deal with nutritional, environmental, health, behavioural and cognitive/neural

175 As outlined at the Animal Welfare Act 1999, s 13(2)(c)
176 Section 24(2)
177 Section 30(2)(c)
178 Sections 13(1A), 24(1), 30(1A)
179 Ministry for Primary Industries, "Codes of Welfare", above n 164
180 Ministry for Primary Industries, "Codes of Welfare"
181 Ministry for Primary Industries, "Codes of Welfare"
182 National Animal Welfare Advisory Committee "Animal Welfare (Pigs) Code of Welfare 2010" at 37

functions and the related needs of animals."[183] Such knowledge is not anecdotal or arbitrary, but rigorous in its methodology, and objectively and critically reviewed. However, in NAWAC's review of the science there may not be one single interpretation, with judgments having to be "made based on the weight of scientific evidence for or against particular propositions."[184]

Initially, animal welfare science focused almost exclusively on nutritional and health needs, given the impact poor welfare in these areas could have on stock quality. However, over time there has been a significant increase in research focused on animal welfare from environmental, behavioural and cognitive/neural perspectives. As Mellor and Bayvel recognised, these aspects have increasingly been:[185]

> …explored as integral parts of problem-solving research in an approach which paralleled that adopted in the earlier nutritional and disease studies. All such research contributed to developments in our thinking about what animals' needs are and how they are affected, positively or negatively, by the way we manage them.

Understanding these aspects of animal welfare may involve testing animals' biological functioning, i.e. their productive/reproductive performance or physical responses measured by heart rate, cortisol levels etc. It may also involve observing their behaviour to determine their affective state. Initially these two frameworks were seen as competing. However, Hemsworth *et al*. stated:[186]

> …a recent more unified approach is that biological functioning is taken to include affective experiences and affective experiences are recognised as products of biological functioning, and knowledge of the dynamic interactions between the two is considered to be fundamental to managing and improving animal welfare.

An example of this unified approach is an animal welfare study of group-housed sows. The authors found that in newly formed groups of sows there are high levels of aggression leading to injury and stress, especially where reduced floor space is available. This has a biological impact on the animals, assessed by concentrations of cortisol in plasma; reduced immuneocompetence as measured by cell-mediated responses; and reduced reproductive performance. However such injuries and stress are also "understood to imply their negative affective consequences, including pain and fear."[187] In this study the authors employed the biological functioning framework to "infer compromised sow welfare, on the basis that suboptimal biological functioning accompanies negative affective states such as sow hunger, pain, fear, helplessness, frustration and anger."[188]

A third conceptual framework for examining animal welfare is that of 'natural-living'. This approach is concerned with behaviours that would be exhibited in a putatively natural or native environment.

183 D.J. Mellor, A.C.D. Bayvel "New Zealand's inclusive science-based system for setting animal welfare standards" (2008) 113 Appl. Anim. Behav. Sci. 313 at 323
184 At 323
185 At 322
186 P.H.I Hemsworth, D.J. Mellor, G.M. Cronin and A.J. Tilbrook "Scientific Assessment of Animal Welfare" (2015) 63 N Vet J 24 at 24
187 At 27
188 At 24

Commentators have warned that the:[189]

> …concept of natural is usually too poorly defined to provide a sound basis for animal welfare assessment, and thus when applied uncritically it may lead to poorer welfare instead of an improvement…There is a need to define natural behaviours that are desirable or undesirable in terms of animal welfare and to clarify the rationale for their inclusion or exclusion.

In the past NAWAC has utilised all three methodologies to define minimum standards e.g. in relation to layer hens.[190] It also refers to biological state, affective state and natural living in one of its guidelines, which states:[191]

> …the Act accommodates reference to all three orientations…by its definition of the physical, health and behavioural needs of animals (section 4(a) – (e)) and by the requirement for NAWAC to consider inputs arising from public notification of a draft code and the consultations NAWAC has undertaken (section 73(2)(a)), and any other matters considered relevant by NAWAC (section 73(2)(d)).

Finally, a theory of 'positive animal welfare' has now emerged in writings on animal welfare.[192] This approach focuses on facilitating positive experiences for animals such as play and social interaction, rather than simply minimising or avoiding negative experiences (which is what animal welfare research has historically focused on).[193] As Hartcher and Jones stated:[194]

> This shift in welfare science has led to the understanding that good animal welfare cannot be achieved without the experience of positive affective states such as feeling comfort, pleasure, and a sense of control…

For example, while behaviours such as play and allogrooming (reciprocal grooming between members of the same species) are not essential for an animal's physical and health needs, the facilitation of such behaviours leads to positive experiences and are 'normal behaviours' for these animals to exhibit.[195]

NAWAC and MPI have both recognised the 'positive animal welfare' approach. The current Chair of NAWAC has stated: "[future] code reviews will need to consider the implications of affective state and

189 At 26. "Some progress is being made in this area via increasing neuroscience evidence which supports previous behavioural science observations that animals find undertaking particular behaviours rewarding (Panksepp 2005; Mellor 2015a,b). These behaviours include elements of exploration, hunting or foraging, affiliative interactions, maternal care of young, play and sexual activity (Mellor 2015a,b). As reward equates to positive affect, these considerations contribute to the affective state conceptual framework. Overall therefore, although the concept of natural living does not provide a rigorous basis for welfare assessment, it usefully draws attention to the potential welfare benefits of providing opportunities to engage in such natural behaviours (Mellor 2015)."

190 "NAWAC has concluded that… all 3 categories must be taken into account to define adequately the minimum and the preferred welfare requirements of a hen." O'Hara and Connor, above n 191, at 207 "Challenge of developing regulations for production animals that produce the welfare outcomes we want" (2007) 2 Journal of Veterinary Behaviour 205 at 207

191 National Animal Welfare Advisory Committee *NAWAC Guideline 06: Wider issues relevant to setting minimum standards* (Ministry for Primary Industries, 2 Sept 2019) at 6

192 See A. Lawrence, M. Spinka and R.C. Newberry, "*Positive Welfare: What does it add to the debate over pig welfare*" in M. Spinka Advances in Pig Welfare (Woodhead Publishing, Duxford, 2017) for an overview.

193 This is part of the reason why the 'five freedoms' has evolved into the 'five domains', as this latter concept conceptualises welfare as more than a freedom from negative states but as access also to positive states.

194 K M Hartcher and B Jones 'The welfare of layer hens in cage and cage-free housing systems' (2017) 73 World's Poultry Sci J at 768

195 "There is also evidence to suggest that play is a rewarding activity. For example, animals actively seek out play partners and solicit play behaviour; the opportunity to play can be used as a reward in place preference conditioning experiments; and thwarting of play often leads to a rebound when the opportunity arises. Allogrooming, which is seen in farm animals such as cattle, horses and pigs, and is associated with reinforcing social bonds and in reducing tension in groups of animals, appears to be rewarding in the short term. The solicitation of social licking demonstrates the rewarding function of the behaviour, at least for the receiver. Soothing effects of allogrooming in terms of a reduction in heart rate have been demonstrated in cattle, horses and primates, but the evidence for this in pigs is less convincing (Boissy et al. 2007). Further examples are available elsewhere (Mellor 2012, 2015a,b)." Paul Hemsworth et al, above n 187, at 29

positive emotions."[196] Kate Littin of MPI wrote in 2019 that "[it] is a stated intention of the National Animal Welfare Advisory Committee that positive welfare will be addressed in minimum standards as codes of welfare are reviewed (currently only a few codes have standards around positive welfare)."[197] And in a submission to the Primary Production Committee in 2018 NAWAC stated:[198]

> Legislative recognition of sentience in the 2015 amendment to the Animal Welfare Act has promoted the need to consider the emotional state of the animals in welfare assessments, and to move towards developing animal management systems that promote positive emotions.

2.4.2 STRUCTURE OF THE CODES OF WELFARE

The codes of welfare provide for minimum standards in relation to animal welfare. These are the bare minimum that owners and persons in charge of animals are required to meet. These minimum standards are accompanied by best practice recommendations, included "to encourage higher standards of animal welfare."[199]

The minimum standards are also often accompanied by 'general information' and by 'example indicators'. 'Example indicators' are a "list of indicators [which] is not exhaustive but is given to provide guidance on ways in which a minimum standard may be met."[200] The use of example indicators was discussed in the NAWAC report to the Code of Welfare (Pigs) 2018 where NAWAC stated that the indicators "afford owners/producers the opportunity to use their own expertise, experience, available technology, and judgment to meet the standard, rather than having an operational standard imposed."[201]

This desire to provide producers with autonomy over their processes is also evidenced in the 'outcomes-based' approach of the codes. Rather than trying to be too specific about how each standard should be achieved, the codes outline the outcomes that owners and persons in charge of animals should be attaining. Thus, for example:[202]

> …defining lower body condition score thresholds is used in preference to delineating required feed component inputs, which are highly variable depending on the animal's maturity, physiological state, thermal environment, exercise requirements and the like.

NAWAC has stated that outcomes-based minimum standards accompanied by example indicators are more likely to be understood by the public "as they relate more directly to the public's expectations than facilities-based regulations."[203]

196 National Animal Welfare Advisory Committee *Annual Report 1 January to 31 December 2016* (Ministry for Primary Industries, July 2017) at 2
197 Kate Littin "Animal welfare evolution or revolution" in *Welfare Pulse* (Ministry for Primary Industries, Issue 28, June 2019) at 1
198 NAWAC Response to the Petition of Save Animals from Exploitation (SAFE) to end the use of farrowing crates, Submission to the Primary Production Select Committee, 27 July 2018 at 3 and 6
199 Ministry for Primary Industries, above n 164
200 Code of Welfare (Layer Hens) 2018 at 3
201 National Animal Welfare Advisory Committee, above n 130, at 5
202 Mellor and Bayvel, above n 184, at 323
203 National Animal Welfare Advisory Committee, above n 130, at 5

2.4.3 WHEN THE CODES OF WELFARE AND REGULATIONS FAIL

The codes of welfare provide a range of benefits for animal welfare. These include providing greater specificity regarding the care of certain animals and, in theory, providing for a standard of care that is based on scientific evidence. However the codes sometimes contain standards that do not meet the physical, health and/or behavioural needs of animals, thereby undermining the Act's general provisions.

This is problematic. As the High Court recently noted, regulations and codes of welfare are "forms of subordinate or delegated legislation made under the empowering provisions of the Act."[204] Thus, they are required to meet the obligations outlined in the Act *unless relevant exceptions apply*. Subordinate legislation "that overrides or is inconsistent with its empowering statute is *ultra vires*."[205]

Such inconsistencies between the Act and the delegated legislation reflect a failure on the part of NAWAC to ensure that the minimum standards established in the codes "are the minimum necessary to ensure that the purposes of this Act will be met" as required under s 73(1)(a) of the Act.[206] It also reflects NAWAC's failure to promulgate inconsistent provisions as regulations under s 183A of the Act, to be phased out within 10 – 15 years.

The ability of codes and regulations to undermine the Act in this way is a long-standing problem. Under the now repealed s 73(3), NAWAC was able to recommend minimum standards and recommendations for best practice that did *not* meet the obligations prescribed by the Act. While such recommendations could be made only in 'exceptional circumstances', NAWAC could take into account the feasibility and practicality of affecting a transition to new practices; the requirements of religious practices and/or cultural practices; and the economic effects of any such transition.[207]

Because 13 of the 19 codes in force today were made under these provisions,[208] there is a risk that inconsistent practices that were enabled by the previous s 73(1) still exist in the codes of welfare. The Code of Welfare (Pigs) 2018 is a good example of this. The Code of Welfare (Pigs) 2010 referred to s 73(3) at minimum standard 10 (Managing Interactions between Sows and Piglets), stating that the section allowed NAWAC in 'exceptional circumstances' to recommend standards that do not fully meet the obligations to ensure that the physical, health and behavioural needs of animals are met:[209]

> Note: Section 73(3) of the Animal Welfare Act 1999 provides that the National Animal Welfare Advisory Committee (NAWAC) may, in exceptional circumstances, recommend minimum standards that do not fully meet the obligations to ensure that the physical, health and behavioural needs of the animal are met. In making this recommendation NAWAC must have regard to, among other things, the feasibility and practicality of effecting a transition from current practices and any adverse effects that may result from such a transition, and the economic effects of any transition from current practices to new practices. NAWAC considers that the confining of sows in farrowing crates for extended periods does not fully meet the obligations of the Act. Minimum Standards 10 (e) and (f) restrict the time sows are confined in farrowing crates to a maximum of five weeks in any reproductive cycle.

204 *The New Zealand Animal Law Association v The Attorney General*, above n 4

205 *The New Zealand Animal Law Association v The Attorney General*, above n 4

206 Animal Welfare Act 1999, 73(1)(a)

207 Section 73(4), revoked

208 Marcelo Rodriguez Ferrere "Codes vs regulations: How best to enforce animal welfare in New Zealand" (2018) 43(4) Altern. Law J. 250-256 at 252: "Reviews of Commercial Slaughter, Dairy Cattle, Horses and Donkeys, Transport and Sheep and Beef Cattle codes of welfare were all finalised after May 2015 and the passage of the Animal Welfare Amendment Act (No 2) 2015 (NZ) which amended these provisions."

209 Code of Welfare (Pigs) 2010, Minimum Standard No. 10

This section was amended in the Code of Welfare (Pigs) 2018 to read as follows:[210]

> Note: Before the Animal Welfare Act was amended in 2015, Section 73(3) of the Animal Welfare Act 1999 provided that the National Animal Welfare Advisory Committee (NAWAC) may, in exceptional circumstances, recommend minimum standards that do not fully meet the obligations to ensure that the physical, health and behavioural needs of the animal are met. In making this recommendation NAWAC must have regard to, among other things, the feasibility and practicality of effecting a transition from current practices and any adverse effects that may result from such a transition, and the economic effects of any transition from current practices to new practices. NAWAC considers that the confining of sows in farrowing crates for extended periods does not fully meet the obligations of the Act. Minimum Standards 10 (e) and (f) restrict the time sows are confined in farrowing crates to a maximum of five weeks in any reproductive cycle. (emphasis added)

NAWAC added the underlined words to the 2018 code to signal that *prior* to 2015, it had used s 73(3) to justify the use of farrowing. *After* 2015, NAWAC provided advice to the Minister of Agriculture in stating that farrowing crates *are* compliant with the Act[211] – despite NAWAC having maintained for *11 years* that such practices do not meet the obligations of the Act and/or should be phased out. The underlined wording above "signals NAWAC's change of position in 2016."[212]

In judicial review proceedings by the NZALA and SAFE, the High Court refused to accept this approach. It found that s 183A provides a specific process for MPI to follow with regards to allowing practices inconsistent with the Act, including the promulgation of regulations and a clear timeline for the phasing out of inconsistent practices. The High Court stated:[213]

> The consequence of the repeal of the exemption [in s 73] is that minimum standards in a code of welfare must now fully comply with the obligations in the Act. Any non-compliance with the obligations in the Act can only be authorised by regulations made under s 183A(2), which must contain specific time frames for non-compliant practices to be transitioned or phased out.

Given this process, the Court found it was not open to NAWAC to suddenly change its mind and decide that these practices *were* consistent with the Act.

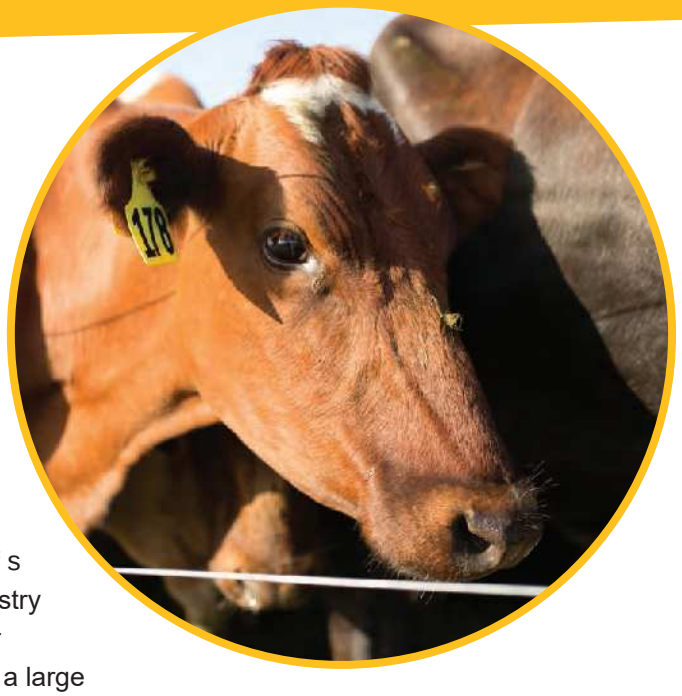
Given that the previous s 73 has been repealed, and in light of this recent High Court case, the current codes of

210 Code of Welfare (Pigs) 2018, Minimum Standard No. 10

211 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [104]. National Animal Welfare Advisory Committee "NAWAC review of the use of Farrowing Crates for Pigs in New Zealand") Ministry for Primary Industries, 14 March 2016.

212 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [179]

213 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [21]



welfare and regulations should be reviewed in order to ensure that any inconsistent practices are phased out under s 183A. Where a new code of welfare or regulation is proposed and where NAWAC reviews any code of welfare under s 78 of the Act and amendments are proposed, these should also be consistent with the Act and where inconsistent, promulgated as a regulation via s 183A.

CONCERNS REGARDING SECTION 183A

Some commentators have concerns that the scope of s 183A(3) is potentially problematic. The particular industry sector affected does not appear to have to be a major industry, nor does the impact appear to have to affect a large sector of the public. It appears on the face of the legislation that any sector of the public or industry would suffice, so long as the impact was regarded as "unreasonable".[214] The Minister may also consider any other factors that would be contrary to New Zealand's overall interests (e.g. in relation to health, social, economic, international or environmental interests).[215]

Speak Up for Animals has argued that regulations made under s 183A that are inconsistent with the Act:[216]

> …should only be used where there would be long lasting and severe consequences to an entire industry or culture and where the industry has not had sufficient warning about changes required.

In justifying this viewpoint, they reference the Select Committee report on the Animal Welfare Bill (No.2) 1999 wherein the Committee considering the Bill clarified that the similar, now repealed section allowing codes to be non-compliant with the Act in 'exceptional circumstances' did not equate to a general 'opt out clause'. Rather, it expected:[217]

> …that this provision would be used rarely and that, in most cases, would relate to production animals which were unable to display normal patterns of behaviour (but had all other physical needs met).

While it is outside the scope of this report to address this issue in greater depth, it may be necessary to reconsider s 183A and to narrow the scope of its application in order to ensure that practices inconsistent with the Act are not easily able to continue via the regulations route.

214 Danielle Duffield, President of NZALA "Animal Law 101: The Practical Operation of the Animal Welfare Act 1999" (NZALA Animal Law Conference, AUT Law School, New Zealand, 1 July 2017)

215 Animal Welfare Act 1999, s 183A(8)

216 Speak Up for Animals "Submissions" <https://speakupforanimals.org.nz/submissions/>

217 Animal Welfare Bill (no. 2) as reported from the Primary Production Committee. Appendix to the journals of the House of Representatives New Zealand 1996-1999 (Vol. LXVI, p. 663-683) at xiii

2.4.4 TAKING INTO ACCOUNT 'ECONOMICS' AND PRACTICALITY'

Codes of welfare may no longer fall below the standards prescribed by the Act, with the s 73(3) "exceptional circumstances" provision having been repealed pursuant to the Amendment Act 2015. The current s 73(1)(a) provides that NAWAC "must be satisfied that the proposed standards are the minimum necessary to ensure that the purposes of the Act will be met." In addition, s 71(1)(b) requires NAWAC to be satisfied that a draft code complies with the purposes of the Act before publicly notifying it.

However, the current s 73(3) still allows NAWAC to consider factors other than animal welfare in determining what minimum standards to include in a draft code, including 'economic impact' and 'practicality'. This amendment was lobbied against by animal welfare advocates who were concerned that it would allow greater weight to economic considerations over animal welfare, contrary to the spirit and purpose of the Act. These advocates included Speak Up for Animals[218] and SAFE.[219] For example, Speak Up for Animals critiqued the use of the criterion 'practicality' and how this might differ from 'economic impact':[220]

> It is quite "practicable" for example to keep pigs in free range conditions, or mixed housing that allows them to turn around, forage and express at least some of their natural behaviours. Indeed many pork producers do so. It is similarly quite "practical" to keep hens in free range conditions, to ban rodeos, as Auckland City have already done, and to use slower growing breeds of broiler chickens that do not suffer from lameness and ascites, as is done in Europe…Using "practicality" as a criterion is not only retrograde but misleading.

Another advocate, Catriona Maclennan, has contended that NAWAC's interpretation of s 73(3) has elevated the criteria of 'practicality' and 'economic impact' to such an extent that NAWAC has failed to "correctly interpret and apply the law since 2000."[221] She cites NAWAC's approval since 2000 of sow stalls, farrowing crates, battery cages and colony cages as examples of this, with the provisions relating to these issues conflicting with the requirement outlined in ss 4 and 9 of the Act that animals must be able to display normal patterns of behaviour. Additionally, she considers that this approach:[222]

> …is not supported by the Act itself [or] by accepted rules of statutory interpretation…The Act clearly provides that it is the Animal *Welfare* Act. The preamble, purposes and other provisions referred to above all emphasize welfare. It is not until section 73 that the matter of economics is provided for in the legislation.

Given these concerns, the current s 73(3) may be in need of further consideration.

2.4.5 TAKING INTO ACCOUNT OPPORTUNITIES FOR BEHAVIOURAL ENRICHMENT

In regards to s 73 and the factors NAWAC are required to consider in the development of a draft code of welfare, we recommend adding the additional requirement of considering the possibilities for environmental and behavioural enrichment for animals in whatever circumstances they may be housed.

218 Speak Up For Animals, above n 217
219 Speak Up For Animals, above n 217
220 Speak Up For Animals, above n 217
221 Catriona MacLennan "Colony cages do not comply with the Animal Welfare Act" (18 Oct 2018) <https://www.catrionamaclennan.co.nz/blog/colony-cages-do-not-comply-with-animal-welfare-act/>
222 Catriona MacLennan, above n 222

Environmental enrichment has been defined as "an animal husbandry principle that seeks to enhance the quality of captive animal care by identifying and providing the environmental stimuli necessary for optimal psychological and physiological well-being."[223] In a 2013 Regulatory Impact Statement MPI acknowledged that the introduction of 'economics' and 'practicality under s 73(3) "may raise questions about other criteria that could be considered by the decision maker e.g. how animals' lives can be enriched…"[224]

Including such a consideration at s 73 would ensure that NAWAC turns its mind to how animals' lives can be enriched so as to ensure that their behavioural needs are met.

2.5 THE ROLE OF THE MINISTRY FOR PRIMARY INDUSTRIES

The fact that MPI administers the codes and regulations is problematic. As described on its website, MPI's focus is on:[225]

> …helping to seize export opportunities for our primary industries, improve sector productivity, ensure the food we produce is safe, increase sustainable resource use and protect New Zealand from biological risk.

Commentators have argued that this constitutes a conflict of interest in terms of ensuring high standards of animal welfare, particularly in relation to MPI's focus on seizing export opportunities for primary industries and improving sector productivity.

Goodfellow contends that there is an inherent conflict between on-farm productivity and farmed animal welfare. In response to a common claim by industry that it is in their commercial interests to treat animals well he observes that an animal's productivity/physical performance is only one indicator of welfare, among many. Other indicators include an "animal's physiological functioning, brain state, behaviour, and even the animal's feelings."[226] Often, productivity gains are met at the expense of these other welfare indicators. Within the Australian context Goodfellow uses the examples of "battery cages for layer hens, individual stalls for pigs, and extremely high stocking densities for broiler chickens"[227] as examples of regulatory failure resulting from the conflict of interest inherent in departments of agriculture and primary industries administering animal welfare legislation. The same could be argued within the New Zealand context in regards to colony cages, farrowing crates and high stocking densities for broiler chickens, as well as the other ways that the codes of welfare and regulations undermine the obligations prescribed by the Act (as discussed in greater depth in chapters four – seven).

Hender has noted within the Australian context the risks associated with Government organisations involved in agriculture administering animal welfare laws, particularly given the use of delegated legislation to implement codes of welfare and regulations under the parent legislation. She stated:[228]

> Agricultural officials and ministers have a mandate to increase the profitability and sustainability of

223 D.J Shepherdson "Tracing the path of environmental enrichment in zoos" in Shepherdson, D.J. Mellen, J.D. and Hutchins, M. *Second Nature – Environmental Enrichment for Captive Animals* (1st edn, Smithsonian Institution Press, London, UK, 1998) 1-12

224 Ministry for Primary Industries, above n 40, at 34

225 Ministry for Primary Industries "About us" < https://www.mpi.govt.nz/about-us/>

226 Jed Goodfellow "Regulatory Capture and the Welfare of Farm Animals in Australia" in Deborah Cao and Steven White (eds.) *Animal Law and Welfare – International Perspectives* (Springer, Switzerland, 2016) 195 at 212

227 At 202

228 Bethany Langman Hender "The Treatment of Farm Animals in Australia: Are Legal Standards Set in Accordance with Democratic Principles" (University of Sydney, 2015) at ii

> the agriculture sector, interests that are often in conflict with animal welfare. The use of delegated legislation means that there is little oversight from parliaments and [in some instances] no requirement for public discussion or deliberation. Given these limitations, a lot rests on the public consultation…to deliver on democracy.

Within the New Zealand context, Duffield discusses MPI's response to the 2015 SAFE international campaign against mistreatment of bobby calves, which she considers "consistent with the presence of regulatory capture"[229] – being the "tendency of regulators to identify with the interest of the industry they are supposed to regulate."[230] She states that MPI's primary concern in developing regulations relating to bobby calves was to protect New Zealand's international reputation and that this motivation is evidenced throughout the Regulatory Impact Statement produced by MPI when it proposed the new regulations and by leading Government officials in the media. Duffield states:[231]

> …the most influential force driving the MPI's response to the undercover investigations was a desire to protect New Zealand's international reputation as a responsible producer of animal products… this policy motivation indicates a clear desire by the MPI to improve animal welfare standards only to the extent that it considers necessary to protect the country's reputation…this purely instrumental approach to animal welfare deviates from the non-instrumental public interest embodied in the Animal Welfare Act 1999.

Duffield further cites concerns that MPI's 2010 policy document *Safeguarding our Animals, Safeguarding our Reputation* is too instrumental, with a number of submissions commenting that it is:[232]

> …overly concerned with adding value to New Zealand's exports, as opposed to genuinely addressing animal welfare concerns. For example, the New Zealand Veterinary Association commented that it was concerned that the focus of the policy was "perhaps too outward looking i.e. preserving our reputation rather than on the rightness of treating animals humanely."

This apparent conflict is one of the reasons for World Animal Protection downgrading New Zealand's animal welfare ranking from "A" to "C" in 2020, stating:[233]

> …the fact that animal welfare falls within the remit of the Ministry for Primary Industries (MPI) indicates that economics is likely to be prioritised over animal welfare. Indeed, the MPI is primarily concerned with promoting and increasing exports, which conflicts with its animal welfare responsibilities.

At the very least, there is a concern that animal welfare may not receive the attention and resource it requires, given that MPI has a very large portfolio and many other priorities and issues to consider. As Biber found: "agencies with competing goals are most likely to underperform on secondary goals."[234]

229 Danielle Duffield, above n 46, at 3 – 4

230 "This occurs when a public authority [such as a government agency] charged with regulating an industry in the public interest comes to identify the public interest with the interests of the producers in the industry, rather than the interests of its customers, or the general public." John Black, *A Dictionary of Economics* (3rd edition, Oxford University Press, USA 2009).

231 Danielle Duffield, above n 46, at 32

232 At 3 – 4, citing Ministry for Primary Industries, "Summary of Submissions Received On: Animal Welfare Matters – Proposals for a New Zealand Animal Welfare Strategy and Amendments to the Animal Welfare Act 1999" 4 (MPI Information Paper No: 2012/08, October 2012) (Obtained under Official Information Act 1982 Request to the Ministry for Primary Industries).

233 World Animal Protection "Animal Protection Index (API) 2020 New Zealand" (March 2020) at 1

234 Eric Biber 'Too many things to do: How to deal with the dysfunctions of multiple-goal agencies" (2009) 33 Harv. Envtl. L. Rev 1 at 4

2.6 THE ROLE OF THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE

Concerns such as these led MPI to establish NAWAC, to provide "independent advice"[235] to the Government minister responsible for animal welfare. However, NAWAC's 'quasi-independent' status is still problematic in terms of ensuring high standards of animal welfare as required by the Act.

Hans Kriek of SAFE referred to NAWAC's 2016 decision on farrowing crates and the fact that this decision was based on research provided by MPI:[236]

> …[NAWAC] made a recommendation to MPI on the research they had received from MPI…So that whole thing was biased, right from the beginning and that's the tricky bit at the moment because MPI is there to help the farmers, and NAWAC and MPI are virtually indistinguishable, because they say [NAWAC is] an independent body that makes recommendations, but they are only as good as the information that they research and look at and if that's provided to them by industry effectively (from MPI), well where do you go with that?

It has also been argued that NAWAC's positioning within MPI has led to a prioritisation of economic considerations in the development of the codes at the expense of societal expectations, international trends and the needs of animals.[237] For example, NAWAC stated it would not move away from cage systems in relation to layer hens, until alternatives were established proven to be better for animals and 'economically feasible'[238] - despite the obvious risks to animal health and welfare of cage systems.[239]

Taking into account reputation and economic considerations in this way does not align with the plain wording or purposes of the Act. The Act does not refer to either of these considerations in outlining its purpose or relevant standards. For instance, the long title of the Act states that it is an "Act to reform the law relating to the welfare of animals and the prevention of their ill-treatment,"[240] and in particular, to "require owners of animals, and persons in charge of animals, to attend properly to the welfare of those animals."[241] The only relevant exceptions to this are ss 73 and 183A.

Section 73(3) allows NAWAC when recommending a draft code of welfare to consider 'practicality and economic impact', if relevant. However, s 73(1)(a) provides that NAWAC still has to "be satisfied that the proposed standards are the minimum necessary to ensure that the purposes of [the] Act will be met." Section 183A allows NAWAC to recommend regulations that do not fully meet the requirements of the Act where "any adverse effects of a change from current practices to new practices have been considered and there are no feasible or practical alternatives currently available"[242] and/or where "not to do so would result in an unreasonable impact on a particular industry sector within New Zealand, a sector of the public, or New Zealand's wider economy."[243] However, such provisions are subject to the phasing-out timeframe of 10-15 years outlined in this section and cannot continue indefinitely.

235 Ministry for Primary Industries, above n 151
236 Interview with Hans Kriek, above n 15
237 See Arnja Dale "Animal Welfare Codes and Regulations – the Devil in Disguise?" in Peter Sankoff and Steven White (eds) *Animal Law in Australasia* (Federation Press, Sydney, 2009).
238 NAWAC *Animal Welfare (Layer Hens) Code of Welfare Report*, 29 June 2012. See Arnja Dale, above n 238, at 16
239 Arnja Dale, above n 238
240 Animal Welfare Act 1999, Long Title
241 Long Title
242 Section 183A(3)(a)
243 Section 183A(3)(b)

2.6.1 THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE'S INTERPRETATION OF THE ACT

It appears that NAWAC's interpretation of the Act has been flawed. In its *Guideline 02: Dealing with practices which might be inconsistent with the spirit of the Animal Welfare Act* NAWAC recognises the obligation the Act places on owners and persons in charge of animals to meet an animals' physical, health and behavioural needs.[244] However, it then goes on to consider s 4, which defines 'physical, health and behavioural needs' to include proper and sufficient food; proper and sufficient water; adequate shelter; opportunity to display normal patterns of behaviour; physical handling in a manner which minimises the likelihood of unreasonable or unnecessary pain or distress; and protection from, and rapid diagnosis of, any significant injury or disease.

NAWAC considers that the requirement under s 4(d) for 'physical handling in a manner which minimises the likelihood of unreasonable or unnecessary pain or distress' means, "there are some situations where Parliament accepted it may be reasonable or necessary to cause pain or distress."[245] NAWAC includes as examples of this "some sporting activities, practices to minimise harm from aggression or dominance behaviours and some confinement systems."[246] It considers this demonstrates that there is a "tension between some of the objectives of the Act",[247] which reflects the different values we have in society. As such, NAWAC finds that where practices may be inconsistent with the Act it must:[248]

> …first consider whether the pain or distress is necessary…[and when] NAWAC concludes that the harm is necessary the second test is to determine whether it is being minimised in a way that is reasonable.

In NAWAC's view, this interpretation of the Act justifies the use of rodeos and zoos; the destruction of millions of day old chicks; beak trimming of layer chicks; and the use of farrowing crates – although the harm caused in these contexts are required to be minimised where possible.[249]

With respect, this is a strained interpretation of the Act. NAWAC based the above argument on what is outlined at s 4(d), which requires "Physical handling in a manner which minimises the likelihood of unreasonable or unnecessary pain or distress." As with the other requirements outlined at s 4, this is a relatively specific section. It was designed to apply to the physical handling of animals (i.e. when they need to be moved or attended to by stockpersons). On a reasonable legal interpretation it cannot be used to justify the tests posited by NAWAC above, or NAWAC's assertion that the objectives of the Act conflict, thus reflecting differing values in society. The Act simply does not provide for such a test in relation to s 10, which clearly provides that owners and persons in charge of animals are *required* to meet their 'physical, health and behavioural' needs.

244 National Animal Welfare Advisory Committee *NAWAC Guideline 02: Dealing with practices which might be inconsistent with the spirit of the Animal Welfare Act* (Ministry for Primary Industries, 17 Feb 2016) at 1
245 At 1
246 At 1
247 At 1
248 At 1
249 At 1

One explanation could be that NAWAC may have conflated the obligation outlined at s 10 with other sections of the Act, namely those that relate to the ill treatment of animals.250 The Act defines ill treatment to mean:251

> …causing the animal to suffer, by any act or omission, pain or distress that in its kind or degree, or in its object, or in the circumstances in which it is inflicted, is unreasonable or unnecessary

However, the sections pertaining to ill treatment are clearly distinct from the obligation outlined at s 10. There is no clear justification for NAWAC to interpret these sections and the definition of 'ill-treatment' as providing a test in relation to meeting the 'physical, health and behavioural needs of animals', as outlined above. And in fact, it does not take this approach in *NAWAC Guideline 06: Wider issues relevant to setting minimum standards*,[252] where it only refers to the obligation outlined at s 10 and the requirement at s 9(2)(a) to meet this standard in accordance with good practice and scientific knowledge. [253]

It is deeply concerning that NAWAC has based its approach to practices inconsistent with the Act on an interpretation of the Act that appears to be legally incorrect. While the guideline states that it "is not a legal interpretation of the Animal Welfare Act 1999",[254] in substance NAWAC have undertaken a legal interpretation of the Act that is flawed. This may reflect the fact that NAWAC is not required to have a member with legal experience, although NAWAC's own guidelines provide that it must possess knowledge and experience in a range of other areas.[255] We note s 58 of the Act requires that, when appointing members of NAWAC, the Ministery must have regard to the need for NAWAC to possess knowledge and experience in a range of areas, including *"any other area the Minister considers relevant."*

Finally, NAWAC's guidelines should be updated to take into account s 183A of the Act and the requirement to phase-out inconsistent practices via regulations, in accordance with the 10-15 year timeframe outlined in this section.

250 Animal Welfare Act 1999, ss 28, 28A and 29(a)
251 Section 2
252 National Animal Welfare Advisory Committee, above n 192
253 At 1
254 National Animal Welfare Advisory Committee, above n 245, at 3
255 National Animal Welfare Advisory Committee, above n 192, at 3. This includes in relation to veterinary science; agricultural science; animal science; the commercial use of animals; the care, breeding and management of companion animals; ethical standards and conduct in respect of animals; animal welfare advocacy; the public interest in respect of animals; environmental and conservation management; and any other area the Minister considers relevant.

2.6.2 THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE'S METHODOLOGY

We consider there is a lack of clarity regarding the methodology that NAWAC uses to review the codes and regulations. In particular, it is unclear exactly how NAWAC:

- Reviews the latest scientific literature and good practice in order to ensure that the codes are meeting the standards outlined in the Act, as required by ss 73(1) and 73(2);
- Ensures that it gives effect to Parts 1 and 2 of the Act when it makes regulations under the Act (as required by s 183A(1));
- Ensures that nothing is missed in the development of codes of welfare and regulations.

When asked about this, Kate Littin of MPI referred us to NAWAC's guidelines. NAWAC *Guideline 04: Process for the development of codes of welfare* states that "NAWAC will take into account good practice and scientific knowledge, available technology, public submissions and any other matters considered relevant, such as practicality and economics…"[256] The guideline further states that any subcommittee tasked with undertaking a detailed analysis of a draft code may clarify points of uncertainty with the code-writing group (for example, scenario testing); access relevant expert advice and undertake site visits and face-to-face meetings relevant to the draft code;[257] and that the draft code is required to be reviewed by a "suitable independent peer reviewer".[258] The guideline reiterates the requirement outlined at s 74(2) of the Act that NAWAC 's recommendations be accompanied by a report setting out the reasons for its recommendation; the nature of any significant differences of opinion about the code in the submissions or within the committee; and any matters the Committee considers should be dealt with by regulations under the Act.[259]

NAWAC *Guideline 05: Role of science in setting animal welfare standards* further outlines the importance of science in the context of developing the codes. The guideline states: "Scientific *knowledge*… and the scientific *method* in terms of its rigour and objectivity of evaluation, including critical peer review, are both employed."[260] This is also reflected by the requirement in the Act for the Minister to appoint NAWAC members with knowledge and experience in veterinary science, agricultural science; animal science; the commercial use of animals; the care, breeding and management of companion animals; ethical standards and conduct in respect of animals; animal welfare advocacy; the public interest in respect of animals; environmental and conservation management; and any other area the Minister considers relevant.[261]

However, it is not made explicit in these guidelines exactly *how* NAWAC reviews the latest scientific literature and good practice. For example, what databases does it use? How does it ensure that its methodological processes are robust such that key information is not missed? How is it acknowledging and accounting for its own bias in the search for and interpretation of data? And how does it ensure that the independent peer reviewer is suitably independent and qualified to review NAWAC's report?

256 National Animal Welfare Advisory Committee *NAWAC Guideline 04: Process for the development of codes of welfare* (Ministry for Primary Industries, 17 Feb 2016) at 1

257 At 3

258 At 5

259 At 3 and 5

260 National Animal Welfare Advisory Committee *NAWAC Guideline 05: Role of science in setting animal welfare standards* (Ministry for Primary Industries, 2 Sept 2019) at 2

261 National Animal Welfare Advisory Committee, above n 192, at 3

Further, when asked about the methodological process used by NAWAC in its development of the codes, Kate Littin of MPI stated: "The reports are not intended to be a fulsome literature review."[262] Additionally, an Official Information Act request from World Animal Protection in 2019 asked MPI whether the reference list contained in each report to the codes lists all the research reviewed by NAWAC in preparing the codes. The response confirmed "that all research consulted was listed at the end of section 74 reports".[263] Thus, not only are the reports not a 'fulsome review', it also appears that NAWAC did not consider any other research aside from what is contained in the reference list of each report. This is worrying as it suggests there could be gaps in NAWAC's understanding.

2.6.3 INCONSISTENCY BETWEEN THE CODES OF WELFARE

It appears that NAWAC may also have applied an inconsistent approach as between the codes of welfare in their review of the latest scientific literature, with some codes referring to a far broader range of literature than others. For example, there seems to be less analysis of the science and less analysis of the standards contained in the code as regards the Code of Welfare (Meat Chickens) 2010 when compared to the other codes we have reviewed. NAWAC's report on the Code of Welfare (Meat Chickens) 2010 is 9 pages long with 31 references. In contrast, the report to the Code of Welfare (Dairy Cattle) 2010 is 21 pages long and considers 36 scientific references; the report to the Code of Welfare (Pigs) 2010 is 35 pages long and considers 126 scientific references; the report to the Code of Welfare (Layer Hens) 2012 is 22 pages long and considers 66 scientific references. Similarly, there is a much greater focus in the Code of Welfare (Pigs) 2018 on the scientific literature in relation to enabling pigs' behavioural requirements, when compared to other codes (e.g. the Code of Welfare (Dairy Cattle) 2019).

This suggests that NAWAC's reports and the codes of welfare themselves may not reflect the actual volume of scientific literature concerning the welfare needs of each animal. While the amount of literature may vary with each species, if this is the case a transparent methodology that can be relied on to locate almost all relevant literature is essential to ensure that the codes of welfare have adequately reviewed the scientific literature. This is also necessary to ensure public confidence in NAWAC's work.

262 Kate Littin, above n 110

263 Dansted, P – Official Information Act Request, 6 November 2017 in World Animal Protection, 'Complaint to the Regulations Review Committee Relating to the Animal Welfare Act', 09 August 2019 at 11

2.7 PUBLIC CONSULTATION AND PARTICIPATION

The process by which the codes are established has proven problematic in terms of public consultation and participation.

First, many of the codes have been prepared by industry in the first instance. For example, the initial pigs code of welfare was originally drafted by the New Zealand Pork Industry Board; the initial layer hen code by the Egg Producers Federation of New Zealand; the initial meat chickens code of welfare by the Poultry Industry Association of New Zealand; the initial deer code of welfare by the Deer Industry New Zealand;[264] and the initial dairy cattle code of welfare by "an industry writing group convened through Dairy Insight."[265] Although some changes in minimum standards contained in these codes have been updated, it is argued that the majority remain substantively unchanged. Thus in these cases, "Code writing has been largely left to livestock industries bodies, which, in the nature of things, cannot be expected to give due weight to animal welfare issues."[266]

While allowing for the voices of industry stakeholders is important, for example in facilitating the recognition of current farming practice, the fact that codes have been so heavily influenced by industry is inherently problematic, as it tends to undermine a neutral, objective approach that balances industry interests with animal welfare. Thus, Arnja Dale (Chief Scientific Officer for the RNZSPCA and current member of NAWAC) has observed:[267]

> Although the NAWAC does not simply accept these versions as submitted, these initial versions have a powerful influence and set the tone for the entire process, normally leading to a final version that is favourable towards the industry that initiated the first draft. Anyone who enters the NAWAC-led consultation phase starts by facing a Code that contains everything the industry wanted, and usually ends up fighting a 'rearguard action' to stop the worst of the practices.

In contrast, Michael Brooks of EPF and PIANZ states that this process is a way for industry to identify what good welfare is; that NAWAC has set out a structure for codes; and that "other groups are entitled to do the same thing."[268]

However, animal advocates have found the code review process to be "both challenging and time-consuming."[269] For example, the Government provided a consultation period of just 5 weeks for consideration of the Amendment Act 2015, which allowed limited input from advocacy groups and the public. Although MPI recognised this and subsequently provided a further 4 weeks for additional submissions,[270] overall the consultation phase was still relatively brief.

Similarly, commentators have expressed some concern over the role of public opinion in the formation of the codes. This is relevant under s 73(2)(a) of the Act, which requires that public submissions and consultations undertaken by the Committee be taken into account when a new code is issued. It is also relevant under NAWAC's definition of good practice, defined to include "the evolution of attitudes about

264 See Arnja Dale, above n 238, at 184
265 National Animal Welfare Advisory Committee, above n 44, at 2
266 RNZSPCA "SPCA Alarmed Over Animal Code Process" (press release, 3 July 2003). as cited in Arnja Dale, 2009 at p. 14, footnote 66
267 Arnja Dale, above n 238, at 184
268 Interview with Michael Brooks, above n 19
269 Sankoff, above n 38, at 19
270 "There was considerable comment, from both public meetings and written submissions, that the consultation period was too short and did not provide stakeholders with sufficient time to adequately consider the proposals. Following this a further four week period was provided for affected parties to provide supplementary information on the proposals." Ministry for Primary Industries, above n 41, at 5

animals and their care."[271] Despite these statutory requirements, NAWAC allowed for a phase-out period of 20 years for battery cages (almost two decades after NAWAC's "admission that these systems do not fulfil the requirements of the Act"),[272] in contrast to the 5-year phase-out period called for by the public in both public surveys[273] and in the public submissions on the code. Similarly, widespread public opposition to caged layer hen systems failed to result in serious consideration being given to non-cage systems.[274] Duffield said of this:[275]

> Such an omission calls for scrutiny: when public opinion is an express statutory consideration, and this overwhelmingly favours cage-free systems, it is inadequate for NAWAC to merely state that the cost of cage-free systems is "expected to be much higher than any of the above options owing to additional running and capital costs" and dismiss it on this basis, without actually conducting any economic analysis on the matter. Rather, the author considers that the requirement of "good practice" presupposes fair and balanced analysis of all alternative housing systems.

While public opinion is only one of a number of statutory considerations to be taken into account, within the context of layer hens "there would have been logic in placing a heavy emphasis on this, as there is little point in investing millions in new infrastructure that before long will have to be phased out in order to meet consumer expectations."[276] Weary *et al*. make a similar comment in relation to the scientific research undertaken on colony cages, with their article investigating the ways in which bias has led researchers to recommend animal welfare 'improvements' that conflict with what the public actually want in practice. They stated:[277]

> …we suggest that if a sustained research effort to understand societal values around cage and non-cage rearing for laying hens had pre-dated or at least accompanied the scientific work, research would have instead focused on the development of high-welfare non-caged systems that are more likely to see widespread adoption in practice.

271 National Animal Welfare Advisory Committee, above n 154, at 14

272 Danielle Duffield "Battery Hens" (2013) NZLJ 235 at 237

273 A 2011 Horizon survey found that 85 per cent of New Zealanders wanted the government to phase out cages within five years (Horizon Poll "Overwhelming Opposition to Battery Hen Cages" (press release, 27 September 2011). At 237

274 For instance, producers were not surveyed on this option and no economic analysis was conducted on it (NAWAC "Consultation on Draft Animal Welfare (Layer Hen) Code of Welfare and Draft Economic Analysis" (February 2011) at 5). At 237

275 At 237

276 At 237

277 D.M. Weary, B.A. Ventura and M.A.G. von Keyserlingk "Societal views and animal welfare science: understanding why the modified cage may fail and other stories" (2016) 10 Animal 309 at 309

2.8 CONCLUSION

The Animal Welfare Act 1999 has set a high standard in terms of acknowledging the sentience of animals and requiring their 'physical, health and behavioural' needs to be met. In addition, the Amendment Act 2015 significantly curtailed the ability to develop provisions that do *not* meet the obligations of the Act.

However, our analysis highlights that the codes of welfare and regulations still undermine the requirements of the Act through providing for standards that do not meet the 'physical, health and behavioural' needs of animals. This was demonstrated in NZALA and SAFE's recent High Court case regarding the use of farrowing crates and sow stalls, where the Court deemed these provisions in the Code of Welfare (Pigs) 2018 and the corresponding regulations "unlawful and invalid."[278]

That codes of welfare and regulations are undermining the requirements of the Act is particularly concerning as the Act provides for a defence for various offences where a regulation is in place, or the minimum standards of a code equalled or exceeded. Thus, in effect the codes of welfare and regulations act to legitimise practices that would otherwise be disallowed under the Act.[279]

This disparity between the high standards prescribed by the Act and the lower standards provided for by the codes and regulations is in part attributable to the role of MPI and NAWAC, and the conflict of interest between these two organisations vis-à-vis industry interests and animal welfare. This conflict has manifested itself in numerous ways, including in NAWAC's prioritisation of economic considerations in the development of the code; in its strained interpretation of the Act, which it has used to justify lower animal welfare standards in regards to the destruction of millions of day old chicks, beak trimming and the use of farrowing crates; in the lack of transparency regarding NAWAC's methodology; in the inconsistency between a number of the codes in terms of the extent of literature considered and analysis undertaken by NAWAC in their development; and in MPI and NAWAC's failure to adequately consult the public on animal welfare matters on numerous occasions.

278 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [197]
279 Animal Welfare Act 1999, ss 13(2)(c) and 183A(11)

“WE LIKE TO INSTIL IN OUR PEOPLE...THEY’RE NOT JUST ANIMALS - AT THE END OF THE DAY THEY’RE VERY MUCH A PART OF THE BUSINESS...IT’S WHY WE’RE ALL THERE. SO THEY EFFECTIVELY PAY OUR WAGES AND PAY OUR BILLS AND AS SUCH THEY SHOULD ALWAYS BE TREATED WITH RESPECT, WELL LOOKED AFTER.”

SHANE KELLY, FORMERLY OF NGAI TAHU FARMING

CHAPTER 3 - COLLABORATION AND CONSULTATION WITH INDUSTRY

3.1 OVERVIEW

In undertaking this report we were generously assisted by representatives of a number of industry bodies, who agreed to be interviewed and to answer our follow-up questions. These included:

- Michael Brooks (Executive Director) of PIANZ and EPF;
- Kerry Gray (Policy Advisor) and Julie Geange (Policy Adviser, Meat and Wool and Animal Welfare) of Federated Farmers;
- Jenny Jago (Strategy and Investment Leader – Farm Performance) of DairyNZ;
- Shane Kelly (former General Manager) of Ngāi Tahu Farming; and
- Mark Preece (Chairperson) of the New Zealand Salmon Farmers Association.

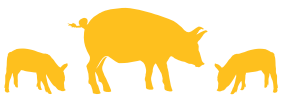
These industry organisations represent the interests of farmers and inform and educate farmers on relevant issues, including animal welfare, stockmanship and food safety.[280] In addition, we interviewed:

- Hans Kriek, former Ambassador of SAFE; and
- Naya Brangenberg (Farmer) of free-range pork farm, Longbush Pork.

We also engaged with Kate Littin (Manager – Animal Welfare) of MPI.

As stated, consulting and collaborating with industry is an important aspect of animal welfare law reform. This involves understanding the barriers that farmers might face to improving animal welfare standards.

280 PIANZ "Who Are We & What We Do" <www.pianz.org.nz/who-we-are/>:
The Poultry Industry Association of New Zealand (PIANZ) represents the interests of more than 99% of poultry meat producers in New Zealand. It ensures that producers meet exacting standards in animal welfare, stockmanship and food safety.
Egg Producers Federation of New Zealand "About EPF" <www.eggfarmers.org.nz/about-eggs/about-epf>:
The Egg Producers Federation of New Zealand (EPF) is the national body representing the interests of all commercial egg farmers, including free-range, barn, colony and cage egg farming systems. Our aim is to make sure that Kiwis have access to good, affordable eggs produced by healthy hens. As part of this commitment, we have been developing and supporting an egg farming industry that looks to employ the highest possible standards, encompassing not just egg quality but hen welfare as well.
DairyNZ "About us" <www.dairynz.co.nz/about-us/>:
DairyNZ is the industry organisation that represents all New Zealand dairy farmers. We invest in practical on-farm tools, research, resources, support and advocacy.
Federated Farmers of New Zealand "About Federated Farmers" <www.fedfarm.org.nz/FFPublic/About/FFPublic/About_Federated_Farmers.aspx?hkey=e30f8cb6-f377-42a9-89fb-3dd43c009206>:
Federated Farmers is New Zealand's leading independent rural advocacy organisation. The federation's aim is to add value to the business of farming for our members and encouraging sustainability through good management practice. Federated Farmers consists of 24 provinces and associated branches giving farmers a collective voice at both a national and provincial level.
New Zealand Salmon Farmers Association "About Us" <www.salmon.org.nz/about-us/>:
The New Zealand Salmon Farmers Association represents the producers of over 98% of all salmon farmed in New Zealand. The NZFSA, is a a voluntary subscription-based organisation comprising of active freshwater and seawater salmon farmers, salmon processors and service product suppliers to the industry. New Zealand's salmon farming industry has evolved from a group of innovative pioneers, to a professional, specialised and quality food production sector focused on environmental sustainability, food safety and value added marketing.
Ngāi Tahu Farming "Te kaupapa matua; Purpose" <ngaitahufarming.co.nz/>:
On behalf of Ngāi Tahu whānau, we manage more than 100,000 ha of farm and forestry land in Te Waipounamu (South Island). The timber, milk, meat and other products from the whenua (lands) go through local processors for export around the world. Our purpose is to produce sustainable products from our environment in a way which is in line with Ngāi Tahu values; contributes to achieving Ngāi Tahu aspirations such as upholding the tribe's role as a kaitiaki (custodian) of the environment, creating employment opportunities for Ngāi Tahu people, and running a successful business. Furthermore, we hope to encourage industry change for better farming practices throughout Aotearoa – New Zealand.



A number of the stakeholders interviewed for this report discussed the importance of industry buy-in to animal welfare law reform and how this can be facilitated. For example, Julie Geange of Federated Farmers described her organisation's approach to animal welfare as:[281]

> …being around the table and ensuring that there's a balance between what farmers can deliver and what's being asked…if you raise the minimum standards so high that people can't meet it you actually risk losing engagement and people wanting to do things better. So people will be competitive and try and improve because they want to and because they can see there's a benefit in it…that's driven through a behaviour change level, which is a really good way to drive that. If you drive that from a regulation position you're not getting the buy-in, the actual genuine buy-in that you need to have improved conditions…

In Geange's view, encouraging farmers to see the benefits in improving animal welfare standards is a part of building industry buy-in. Those benefits may be in relation to our trading reputation or in relation to improvements in production[282] and growth rates of the animal in question.[283]

Kerry Gray of Federated Farmers cited a recently implemented regulation in relation to the use of anaesthetic for de-horning as an example of industry buy-in:[284]

> …most farmers you talk to are saying it doesn't matter because we've already started doing it a year or two ago. As soon as the expertise became available, we jumped on it and it doesn't cost us anything extra. Or if it does cost a little bit extra, it's more than offset – there's no loss in growth rate in the animal…so they'll jump on it because it makes sense.

Another important aspect of facilitating such buy-in is through the provision of information, which is an important function of industry organisations and one of the aims of this report. As Shane Kelly of Ngāi Tahu Farming stated:[285]

> …how are you going to drive true change behaviour as opposed to just beating people into submission so that they have to do it? Whilst that works temporarily, I think how you create true change and understanding so that it happens naturally - that happens through education.

3.2 INDUSTRY-LED MEASURES

As outlined above, animal welfare is something industry and farmers do take into account and it is important to acknowledge the work done by industry to do better and the ways in which industry-led initiatives can assist in implementing the Act, regulations and codes of welfare to a high standard.

Shane Kelly of Ngāi Tahu Farming stated:[286]

> We like to instil in our people…they're not just animals - at the end of the day they're very much a part of the business that - it's why we're all there. So they effectively pay our wages and pay our bills and as such they should always be treated with respect, well looked after. Treated like babies to a degree.

281 Interview with Julie Geange, above n 20
282 Interview with Julie Geange
283 Interview with Kerry Gray, above n 36
284 Interview with Kerry Gray
285 Interview with Shane Kelly, above n 37
286 Interview with Shane Kelly

Similarly, Julie Geange of Federated Farmers stated:[287]

> …ultimately when you talk to our guys, the majority of our guys [are] proud of their animals, they're proud of how they treat them, they seem them not just as a commodity but as something they that they work with.

And Kerry Gray of Federated Farmers noted:[288]

> The vast majority of farmers, they love their animals. They are trying to do their absolute best and if suddenly there's a missed piece of information, or a requirement that they weren't aware of before, they are gutted.

Finally, Jenny Jago of DairyNZ stated: "Most farmers are extremely cognisant of their consumers and consumer trends and take animal welfare seriously – applying best practice animal welfare practices."[289]

MEASURES LED BY THE MEAT AND LAYER HEN INDUSTRIES

PIANZ and EPF have an industry veterinary technical committee that meets every six weeks to discuss food safety and animal welfare issues; they are currently working to consult with NAWAC and SAFE on revisions to the Code of Welfare (Layer Hens) 2018 and Code of Welfare (Meat Chickens) 2018 and on a draft code for breeder birds;[290] they have regularly attended a Chief Executives Animal Welfare Forum organised by MPI; and t have recently facilitated site visits with the Head of Animal Welfare for MPI to layer hen and meat chicken farms to look at welfare in terms of slaughter processes.[291] In addition, PIANZ has:[292]

> …developed level 1, 2, 3 and 4 qualifications for the poultry industry through the Primary ITO…[and have] very, very good uptake for meat chicken farmers. It's currently PIANZ policy that every meat chicken farmer or somebody on their farm must have a minimum of a level 2 qualification and we believe we have about 99% industry coverage for that.

Brooks stated, "stockmanship is the area which leads to most improvements for welfare. However I believe NAWAC needs to be more proactive in ensuring standards of stockmanship improve."[293]

Good stockmanship is essential in ensuring the physical, health and behavioural needs of animals.[294] However, although we have been told that they have an expectation of having trained and competent staff

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287 Interview with Julie Geange, above n 20

288 Interview with Kerry Gray, above n 36

289 Email from Jenny Jago (Strategy and Investment Leader – Farm Performance at DairyNZ) to the author in response to the question "What do you think are the implications for dairy farmers' national and international reputations as regards animal welfare compliance? E.g. Do dairy farmers see maintaining high standards of animal welfare as important for remaining competitive in the international economy?" (4 April 2020).

290 Breeder birds are birds that are used to produce offspring, which will be used as meat chickens or layer hens.

291 Interview with Michael Brooks, above n 19

292 Interview with Michael Brooks. Brooks further stated that understanding the codes of welfare is a "key part of the qualification process… the livestock advisers are aware of them, they understand what they're doing."

293 Email from Michael Brooks (Executive Director of PIANZ and EPF) to the author regarding this report (7 February 2020)

294 As Marchant-Forde (2011) states in reference to pigs: "The other major factor, some would argue the main factor, that influences the welfare of animals within a given system is that of the quality of stockmanship (Hemsworth, 2003). Whatever the housing system, even in those with high degrees of automation, there is a need for human input for the system to function. All phases of pig production involve interactions between humans and pigs during routine husbandry. The skill of the human is of paramount importance and with poor quality of stockmanship, the welfare of pigs within the best, ''welfare-friendly'' system can be extremely poor." Jeremy N. Marchant-Forde "Introduction to the Welfare of Pigs" in Jeremy N. Marchant-Forde (ed) *The Welfare of Pigs* (Springer, Dordrecht, 2009) 1 at 7

on farm and that training courses are available for farmers,[295] industry bodies such as DairyNZ, Federated Farmers, Ngāi Tahu Farming, the New Zealand Salmon Farmers Association and NZ Pork do not currently have a policy or requirement that farmers must acquire qualifications that incorporate teachings relating to animal welfare and the codes of welfare and regulations.

Additionally, despite each of the codes of welfare for pigs, dairy cattle, meat chickens and layer hens referring to the importance of good stockmanship,[296] there is no legal requirement under the Act or in the relevant codes to hold qualifications to ensure that stockpersons are adequately qualified and aware of relevant animal welfare issues. This requirement could be included as a minimum standard in each of the codes of welfare, or at least as a recommended best practice. It could also be clear in any amendments to the code on this topic that the relevant course has to adequately canvass animal welfare issues, and to review the Act, codes of welfare and regulations. At present, it is unclear exactly what the courses provided by the Primary Industry Training Organisation consist of and whether they incorporate a review of the Act, codes of welfare and regulations. Their website does not clarify this[297] and we were not able to ascertain this despite numerous calls to the organisation.[298] For instance, we were told that we need to be "employed" and to have an "employment agreement" to know about their courses; informed only that the content of their courses are "mostly practical"; and that they did not know if they provided courses for layer hens.[299]

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295 Email from Jenny Jago (Strategy and Investment Leader – Farm Performance at DairyNZ) to the author regarding qualifications for dairy farmers (4 April 2020):

> Currently in NZ there is no requirement for a qualification to work on a dairy farm. However, most dairy companies require staff on supply farms to have passed milk quality courses where the standards are governed by Primary ITO, and include areas of cattle handling, health and welfare.

Email from Kerry Gray (Policy Adviser – Dairy at Federated Farmers) to the author regarding qualifications for dairy farmers (23 March 2020):

> As the age and experience of the workforce in the Dairy industry varies greatly, it is not possible to have a hard and fast rule. For example, an 'older' manager (~40s +) is not usually a new entrant to the industry so has a lot of experience, but is highly likely to have engaged in professional development opportunities over the years, whereas a new entrant (18yrs, 20's+) is likely to enter a more formal education pathway either before or as they progress in the industry. Our policy is that all milkers are competent, and that is in our contracts. In terms of the industry, there are very clear expectations. The vast majority of manager jobs and sharemilking/contract milking positions advertised in the past 5 years require level 4 ITO as a minimum.;

Email from Shane Kelly (former General Manager of Ngāi Tahu Farming) to the author regarding qualifications on farms under the auspices of Ngāi Tahu Farming (7 March 2020):

> There are "no requirements to obtain qualifications" within Ngāi Tahu Farming, however it is "encouraged that staff upskill and this can be done in a number of ways including courses through [the Primary Industry Training Organisation] whilst working."

Email from Mark Preece (Chairperson of the New Zealand Salmon Farmer's Association) to the author regarding qualifications in the salmon farming industry (2 March 2020):

> … we don't specify a level of education for entry. However, salmon farming is a relatively technical industry (compared to most primary industries), and at last count we had 30% of our team tertiary qualified – we really need a highly trained workforce. The NZ education system has been relatively slow to pick up on the growth in the aquaculture industry, so we've had to develop our own training through the support of the Seafood ITO (now PITO: https://studyspy.ac.nz/courses/4812/national-certificate-in-aquaculture-caged-fish-farming-level-3). We've worked hard with the tertiary sector and especially NMIT developing their diploma (https://www.nmit.ac.nz/study/programmes/diploma-in-aquaculture-fish-farming-and-fishery-management/: phasing out now) and degree (https://www.nmit.ac.nz/study/programmes/bachelor-of-aquaculture-and-marine-conservation/: starting up) courses – I was personally involved in both, and industry actively supports these.

Telephone call with NZPork (Rebecca Ong, 2 March 2020)

The Primary Industry Training Organisation is the main industry training provider in New Zealand. See https://www.primaryito.ac.nz/about-us/.It is not necessary for pig farmers to have a Primary Industry Training Organisation qualification, although NZPork does offer Level 3 and Level 4 courses.

296 "Pigs must be cared for by a sufficient number of personnel, who collectively possess the ability, knowledge and competence necessary to maintain the health and welfare of the animals in accordance with this Code" (Code of Welfare (Pigs) 2018, Minimum Standard No. 1 at 6); "Meat chickens must be cared for by personnel who collectively possess the ability, knowledge and competence necessary to maintain the health and welfare of the chickens in accordance with this Code" (Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 1 at 6; "Dairy cattle must be cared for by personnel who collectively possess the ability, knowledge and competence necessary to maintain the health and welfare of the chickens in accordance with this Code" (Code of Welfare (Dairy Cattle) 2019, Minimum Standard 1 at 6); "Layer hens must be cared for by personnel who collectively possess the ability, knowledge and competence necessary to maintain the health and welfare of the chickens in accordance with this Code" (Code of Welfare (Layer Hens) 2018, Minimum Standard No. 1 at 6)

297 Primary Industry Training Organisation "Choose a Sector" < https://www.primaryito.ac.nz/courses-for-you/>

298 Call to the Primary Industry Training Organisation (Rebecca Ong, 12 May 2020) where we were informed that the person we needed to talk to was unavailable and would call us back. This never happened; Call to the Primary Industry Training Organisation (Rebecca Ong, 19 May 2020) where we were informed that the Regional Co-Ordinator would call us back. This never happened; Call to the Primary Industry Training Organisation (Rebecca Ong, 25 May 2020) where we were again informed that someone would call us back.

299 Call to the Primary Industry Training Organisation

Notably, EPF have experienced some resistance from layer hen farmers to obtaining qualifications. Michael Brooks of EPF linked this to layer hen operations being smaller; farmers having difficulty taking time off to do the 2-3 day off-site course; and due also to reluctance on the part of some second and third generation layer farmers who do not consider it necessary.[300] Such resistance is concerning given that most caged farms would house tens of thousands of layer hens, and if they are not funding enough staff to be able to attend such training courses (despite assumedly large annual turnovers) this is in itself a problem.

MEASURES LED BY THE DAIRY INDUSTRY

DairyNZ are in the process of implementing a 'Dairy Tomorrow Strategy', with the ultimate goal of establishing leading animal care in New Zealand.[301] Jenny Jago informed us that:[302]

> There's a commitment in the Dairy Tomorrow Strategy – an aspiration to be world leading in in-farm animal care, and that is where we're trying to plan towards. Obviously the first step in that is understanding what world leading actually is - and we're approaching that by looking at what consumers'/public expectations are around that or what clients tell us around that and what farmers say around that. So, we're trying to take quite a holistic approach.

At this stage it is unclear the extent to which this strategy will incorporate reference to the codes of welfare, regulations and Act. However, the aspiration it establishes is important and may assist in informing farmers and encouraging them to implement higher standards of animal welfare on their farms.

The flow of information from Dairy NZ is also helpful in terms of providing guidance to farmers. As Shane Kelly of Ngāi Tahu Farming stated:[303]

> …that's something we're very lucky to have. If you talk to farmers the world over they would all love to have something like DairyNZ in their own countries, just that information flow that we have…

Federated Farmers has an animal welfare work programme and regularly communicates with dairy farmers and MPI on pertinent issues and the development of codes of welfare. Julie Geange stated:[304]

> When it comes to communication and resource, we want our farmers to be educated on what the regulations and the codes contain and what is in the Act. So we are active in that space and especially when there's been an identified issue that needs to be dealt with…we'll work quite closely with MPI and other industry bodies around that.

MEASURES LED BY THE NEW ZEALAND SALMON INDUSTRY

The New Zealand Salmon Farmers Association is in the process of developing a code of welfare for the industry. This is discussed further in chapter eight.

300 Interview with Michael Brooks, above n 19

301 Dairy Tomorrow "World leading animal care defined" <https://www.dairytomorrow.co.nz/animal-care/.> This involves the use of a tiered bronze, silver and gold framework for dairy farmers in relation to animal welfare.

302 Interview with Jenny Jago, above n 3

303 Interview with Shane Kelly, above n 37

304 Interview with Julie Geange, above n 20

BIASES AND MOTIVATIONS

It is important to acknowledge industry-led efforts and to understand the challenges farmers face and their underlying concerns. However, ultimately both farmers and industry organisations do have their own biases and motivations, with business models that are driven to prioritise economics and practicality above animal welfare. Goodfellow noted the work of agricultural economics in this area. He stated:[305]

> …[there is] a predominantly negative relationship between animal welfare (as perceived by humans) and productivity, understood as the rate of output (eggs, milk, wool, meat etc.) per input (costs of feed, medications, labour, infrastructure etc.)…while it is possible to have some degree of complementarity between welfare and productivity at low levels of output, greater productivity gains will only come at the cost of animal welfare.

This is demonstrated in the graph below at Figure 2, with Point A representing animals as they are found in nature. It shows that as animal welfare increases, productivity increases - but only up to a point (Point B). Beyond this, productivity gains can only be made by reducing animal welfare.

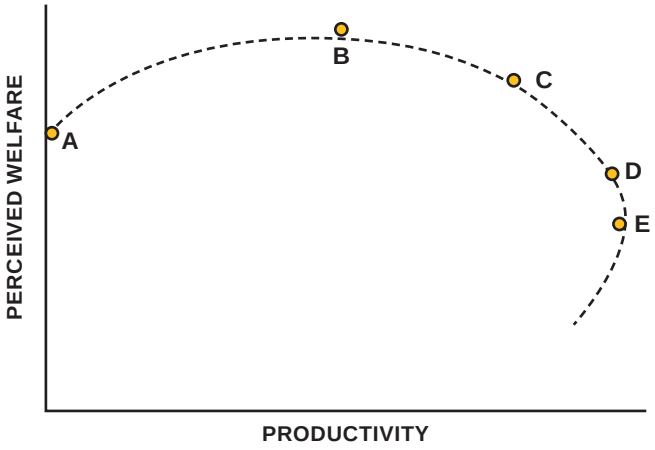

Figure 2. Relationship between animal welfare and productivity[306]

We have re-drawn this figure to make it more legible, however no substantive changes have been made.

Thus, Goodfellow argues that those responsible for the welfare of animals within a production context possess a financial incentive to act in a manner that is contrary to the interests of the animals they care for.[307] NAWAC has recognised this, stating:[308]

> In regards to the drivers of animal welfare, it was acknowledged that cost and economics is a key element: for example eggs have become progressively cheaper, driving farmers to intensify over the decades.

Similarly, NAWAC has noted in relation to farrowing crates that "the problem stems from a drive for profitability from larger litters."[309]

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305 Jed Goodfellow "Animal Welfare Law Enforcement: To Punish or Persuade?" in Peter Sankoff and others (ed) *Animal Law in Australasia* (2nd ed, The Federation Press, Sydney, 2013)183 at 200

306 First presented in McInerney, J (1991) 'Economic Aspects of the Animal Welfare Issue', Paper presented at the Society of Veterinary Epidemiology and Preventative Medicine Annual Meeting, London. Reproduced in Bennett, R (1997) 'Animal Welfare, Economics and Policy' in Appleby, M (ed) Animal Welfare, CAB International; and McInerney, J (2004) Animal Welfare, Economics and Policy: A Report on a Study Undertaken for the Farm and Animal Health Economics Division of DEFRA, p 18.

307 Goodfellow, above n 306, at 201

308 National Animal Welfare Advisory Committee Minute "General Meeting" (10 March 2015) at [O 3]

309 National Animal Welfare Advisory Committee Minute "General Meeting" (4 November 2015) at [C 5]

3.3 OTHER PERSPECTIVES

In contrast to what is outlined by industry organisations, animal advocacy groups have a very different view of the way in which farmed animals are treated under our current legislative regime. Hans Kriek of SAFE stated that the behavioural needs of animals have not been prioritised since the inception of the Act and that animal welfare standards have been established that are more in the interests of industry than animals. He stated:[310]

> …that whole behavioural side in the legislation is ignored virtually anywhere. But the problem is, it's about degrees on what you remove. Because the industry will try to argue that yeah, they can express their normal behaviour – they can eat, they can drink and they can sleep – and for them that's their normal behaviour. For us, it's a lot more…So it's where you draw the line and I think the lines have been drawn obviously very much in favour of industries rather than the animals.

Kriek also expressed scepticism towards the motivations of industry and its willingness to make changes. He stated, "when you talk about animals and industries it's always about one thing only and it's money."[311] Similarly, in relation to environmental enrichment for meat chickens Kriek stated:[312]

> …we had a meeting with the industry only two weeks ago and they're just totally not interested… It's only when there's going to be public pressure and people see all of these dying animals and they get to understand the level of suffering that you'll get to see some change…It's going to take a lot of pressure and pressure from within – so you're going to have to have farmers that want to see change.

This viewpoint on industry has led to SAFE changing tactics in recent times to increasingly focus on retailers. For example, SAFE has been in dialogue with supermarkets such as Countdown to successfully ban the sale of colony eggs in supermarkets.[313] Hans Kriek noted they have gotten every large supermarket in New Zealand to commit to being colony-egg free, following the Government's refusal to act on this.[314] This approach has been influenced by the fact that SAFE has found encouraging legislative change in relation to farmed animals difficult because "farmers have a high standing in society"[315] and this heavily influences the Government's approach to animal law reform.

310 Interview with Hans Kriek, above n 15

311 Interview with Hans Kriek

312 Interview with Hans Kriek

313 "And we got successful, because we changed tactics away from the government and put it on retailers. We started with Countdown, we put a hell of a lot of pressure on Countdown for a whole year they said no, no, no, no, no - and, in the end, because it is an issue that is publicly supported, they were the first to go. And now all the supermarkets are moving away from caged eggs - so now the industry is mad at the supermarkets because those farmers who have heavily invested in colony cages are going to lose to the supermarkets, and supermarkets sell over half the eggs produced in NZ." Interview with Hans Kriek.

314 "All major NZ supermarkets to drop cage eggs" *NZ Herald* (online ed, New Zealand, 22 Feb 2018)

315 Interview with Hans Kriek, above n 15

3.4 PROVIDING AN INDEPENDENT PERSPECTIVE

Given this diversity in viewpoints, this report is intended to provide an independent perspective on the animal welfare standards that currently exist in New Zealand, and to address the ways in which these need to be reviewed and reformed in order to authentically meet the standards outlined in the Act.

Our analysis is based on the requirement outlined in the Act that those who own and are in charge of animals are required to meet the 'physical, health and behavioural needs' of those animals. In order to determine what the 'physical, health and behavioural needs' of animals are, we consider the latest scientific literature so as to conduct an evidence-based review of the codes of welfare and regulations. This is important because, as Michael Brooks of PIANZ and EPF stated:

> …you have to be objective because you can't have an emotive approach to this, you must have good science to underpin what decisions are made. And on that basis, the industry accepts the concept of NAWAC, accepts the concept that independent group of people make decisions on a code that is designed to meet [the Act]. As soon as you get to scenario where that isn't the underlying basis of decisions on animal welfare, then you lose the confidence of the industry, of the farmers, and it just becomes a scenario where there are no rules and I think that's really important, that it has to be objective…that's how you get industry buy-in.

However, it is also accepted that while attempting to objectively review the science is an appropriate way to approach this issue, this also has its limitations. As Mellor recognised:[316]

> Although science has made major contributions to improving animal welfare, science alone cannot be used to determine what are and are not acceptable animal welfare standards. Judgement, involving consideration of cultural, social and ethical issues, practicalities of achieving change, economics and other factors, is also required.

As such, we have attempted to situate this research within a wider set of concerns by considering the cultural, social and ethical issues associated with animal welfare in farming; addressing issues of economics and practicality; and acknowledging any potential biases in our perspective (at section 1.5).

Conducting such an analysis also means acknowledging that animal welfare organisations, farmers and other industry players are not the only relevant stakeholders in this conversation, but that consumers also have an important part to play in the development of higher animal welfare standards. In particular, if consumers want

316 David J. Mellor and A.C. David Bayvel "The application of legislation, scientific guidelines and codified standards to advancing animal welfare" (paper presented to Global Conference on Animal Welfare: an OIE initiative, Paris, 23-25 February 2004) 249 at 255

higher animal welfare standards then they must also be prepared to accept the coist increases associated with this. As MPI has recognised, while farmers:[317]

> …do have the ultimate responsibility for the welfare of animals in their care…they operate in a system that has been driven by a desire for production from their animals and their land, and they are therefore both supported and constrained by others. We see this issue as one that has responsibilities shared by all in the pastoral farming supply chains.

Animals are of course stakeholders too. We know that they are sentient, and that their lives and wellbeing matter in our society. This is reflected in our legislation and evidenced in numerous surveys of New Zealanders' views on animal welfare. Further, animals are inherently vulnerable and incapable of asserting their own interests. As Goodfellow writes:[318]

> Animals have no means of asserting their interests. They have no ability to communicate their concerns; they lack legal and political personality. Accordingly, they cannot file legal complaint in response to wrongs committed against them, nor can they vote to support those who represent their interests.

There is thus an ethical duty on us as both consumers and producers to protect animals from forms of exploitation that compromise their welfare.

317 Winter Grazing Taskforce, above n 1, at 2
318 Goodfellow, above n 306, at 199

“...DAIRY CATTLE ARE HIGHLY MOTIVATED TO USE SHADE IN WARM WEATHER AND CONSIDER SHADE A VALUABLE RESOURCE THAT THEY ARE WILLING TO COMPETE FOR.”

EXTRACT FROM PAGE 82

CHAPTER 4 - CODE OF WELFARE (DAIRY CATTLE) 2019

4.1 OVERVIEW

The Code of Welfare (Dairy Cattle) 2019 applies to all dairy cattle, including calves born from dairy cows until weaning, all dairy replacement stock and calves sent for slaughter. It does not include dairy cattle, once weaned, that are raised for beef production – these animals are covered by the Code of Welfare (Sheep and Beef Cattle) 2018.[319]

We analysed the Code of Welfare (Dairy Cattle) 2019 through conducting a peer review of the research that would have been available to NAWAC when it first reviewed the code in 2010; by reviewing the literature that has subsequently become available since 2010; by reviewing literature relevant to the 2018 and 2019 amendments to the code; and by reviewing NAWAC's reports to the codes of welfare.[320] We also reviewed the regulations relevant to dairy cattle.

This analysis exposes numerous welfare issues. These include:

- **Shelter**: The code of welfare and regulations do not currently require dairy cattle to be provided with shelter, which these animals clearly need in both cold and hot conditions. That this issue continues to persist (as recognised by both MPI and NAWAC) evidences the inadequacy of the current minimum standards, which impose only a vague requirement on farmers to provide dairy cattle with the "means to minimise the effects of adverse weather."[321] While a number of industry stakeholders are implementing reforms on-farm and promoting the use of shelter through their educational initiatives, the provision of shelter should be a minimum standard in the code so as to ensure that it will be provided and the welfare of dairy cattle ensured. Further minimum standards or recommended best practice provisions could also be implemented in the code to assist with reducing heat and cold stress, including minimising time spent in the yard; the use of computerised collars to measure the temperature of dairy cattle; and clarification of what shade and shelter can mean. Contingency plans should also be mandatory, so as to better ensure animal welfare in extreme weather events such as floods, storms and droughts.
- **Winter Grazing**: MPI has recently identified winter grazing as a significant welfare issue in relation to dairy cattle, with this practice leading to a range of physical and health conditions and the frustration of the dairy cattle's ability to express its behavioural needs. MPI has created an Action Group to address the issues associated with this, which may be through regulations and/or amendments to the code of welfare.
- **Off-Paddock Facilities and Lack of Access to the Outdoors:** In 2019 NAWAC revised the code of welfare to include minimum standards relating to off-paddock facilities. These standards are highly problematic because, at present, they provide dairy cattle with insufficient space to perform behavioural needs (such as walking, exploration, grazing and foraging, lying down in extended positions and engaging in social interactions); they will contribute to a higher incidence of disease and other health issues (such as lameness, mastitis, hoof disorders, skin lesions, swelling of the hocks and knees and swollen pasterns); and they do not require dairy cattle to be provided with access to

319 Code of Welfare (Dairy Cattle) 2019 at 5

320 National Animal Welfare Advisory Committee, above n 44; National Animal Welfare Advisory Committee *Report on the 2014 amendment to the dairy cattle code* (Ministry for Primary Industries, 30 May 2014); National Animal Welfare Advisory Committee *Report to Accompany An Amendment to the Code of Welfare for Dairy Cattle* (Ministry for Primary Industries, 31 October 2019).

321 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 7(a) at 13

the outdoors. In addition, any future provisions will likely only require dairy cattle to have access to an outdoor area with a soft compressible surface area and not to pasture, specifically – despite the fact that dairy cattle prefer pasture and that it better meets their physical, health and behavioural needs.

- **Stocking Densities**: Dairy cattle in off-paddock systems will be more highly stocked, as compared to dairy cattle in equivalent pastoral farming systems. This is problematic, as the code of welfare currently has no provisions specifying maximum stocking densities.
- **Ventilation**: High levels of ammonia are permitted in off-paddock systems, which may be harmful to dairy cattle. It is also not a requirement of the code that these levels be measured and monitored by farmers.
- **Ability of Dairy Cattle to Express Their Behavioural Needs:** The code of welfare fails to adequately ensure the behavioural needs of dairy cattle. It does not require that cattle be provided with sufficiently soft surfaces to lie down for an adequate period each day and permits cattle to be left standing on concrete or other hard surfaces for 12-14 hours a day, despite the impact this can have on the health of dairy cattle and the fact that this frustrates their behavioural need to lie down. There are also no provisions requiring play, grooming, maternal, or exploratory behaviours in dairy cattle to be facilitated, despite these being important behavioural needs.
- **Mixing of Dairy Cattle**: The code does not adequately ensure the welfare of dairy cattle in relation to mixing dairy cattle, which causes increased aggression. There are no minimum standards in relation to this.
- **Restraint of Dairy Cattle:** It is highly problematic that cows may be tethered indefinitely and only inspected every 12 hours, and that electroimmobilisation devices may be used by those not fully conversant with safe operating procedures.
- **Use of Electric Prodders and Goads:** Electric prodders may be used on dairy cattle however there should be additional requirements in place to ensure the animal's welfare (e.g. that the prodder/goad be applied for no more than one second; that their use should be discontinued after four or five attempts; and that their use should be adequately spaced out). It is also not a requirement of the code that goads not be used on the ears and nose of animals, despite these areas being sensitive.
- **Drying Off:** Numerous recommendations relating to drying off in both scientific publications and by industry organisations such as DairyNZ have not been incorporated into the code, despite risks to dairy cattle health such as mastitis.
- **Calving:** Calving in dairy cattle does not need to be inspected by a trained and competent operator; the issue of dystocia (the slow and/or difficult birthing of a calf to a cow) is not addressed in the code but is prevalent in calving dairy cows; and induction is technically permitted by the code, despite the now well-recognised welfare issues associated with this.
- **Other Health Issues:** A range of other health issues are not adequately addressed in the code, including in relation to lameness, metabolic diseases, mastitis, Johne's disease and broken shoulders.
- **Castration:** Regulation 53 of the Animal Welfare (Care and Procedures) Regulations 2018 does not require dairy cattle under the age of 6 months old to be given local anesthetic when castrated, despite a) the fact that such procedures are painful for dairy cattle and b) the recognised benefit of anesthetics in reducing pain and stress responses in calves as a result of this procedure.
- **Selective Breeding of Dairy Cattle:** There are a range of health issues associated with the selective breeding of dairy cattle for high milk yields including increased leg and metabolic problems; declining longevity; lameness; mastitis; ovarian cysts; ketosis; low body condition score and more. This is not addressed by the code.
- **Bobby Calves:** Despite additional regulations pertaining to bobby calves having been promulgated in recent years, it appears there are still major unaddressed welfare issues pertaining to these animals. They are separated from their mothers almost immediately after birth, leading to stress for both

mother and calf; millions of these animals are slaughtered every year as a 'waste product' of the dairy industry; and many of these calves do not appear to be fit prior to being slaughtered (despite this being a requirement of the regulations), with a 2016 study finding a 20% prevalence among bobby calves of dehydration, faecal soiling, increased respiratory rate and ocular and/or nasal discharge.[322]

NAWAC has outlined in its *Timeline for Reviewing Codes of Welfare* that the Code of Welfare (Dairy Cattle) 2019 is to be reviewed in the next 1-3 years.[323]

4.2 SHELTER

Minimum standard 7 (Shelter) prescribes the requirements for shelter in regards to dairy cattle. It states at minimum standard 7(a) that "all classes of dairy cattle must be provided with the means to minimise the effects of adverse weather."[324] Further, newborn calves that have been removed from their mothers are required to be provided with shelter from conditions likely to adversely affect their welfare;[325] sick animals and calves not suckling their mothers must have access to shelter from adverse weather;[326] and priority has to be given to remedial action that will minimise the consequences of exposure where animals develop health problems as a result of such exposure to adverse weather conditions.[327]

Shelter was of particular concern to the public in submissions on a draft version of the earlier code, promulgated in 2010. As NAWAC stated in its 2010 report: "Many submissions were concerned… that the Code falls short of an adequate means of protecting the welfare of dairy cattle required by the Animal Welfare Act 1999."[328] A number of stakeholders interviewed for this report also identified shelter as a potential risk area and/or an area for development into the future. This included Ngāi Tahu Farming, which is currently in the process of planting shelterbelts around all pivots, and also some internal shelterbelts (being a line of trees or shrubs planted to protect a given area from adverse weather). Shane Kelly, former General Manager for Ngāi Tahu Farming, has stated that it will be "5-6 years before that gets to a level that will provide significant shelter. But long-term we will have what we would consider good shelter for our stock."[329] Similarly, DairyNZ identified "winter management [and] interventions for heat stress"[330] as potential areas of concern.

Access to shelter on hot, rainy, cold, or windy days is important for dairy cows. Legrand *et al*. found that dairy cattle prefer pasture at night, and access to indoor housing during the day when temperature and humidity increase.[331] Krohn *et al*. reported a preference for pasture as the preferred lying place for dairy cows in summer, with cows preferring indoor straw housing with deep bedding during winter.[332] Other

322 Alana Boulton, Nikki Kells, Ngaio Beausoleil, Naomi Cogger, Craig Johnson, Anna Palmer, Richard Laven, Cheryl O'Connor and Jim Webster *Bobby Calf Welfare Across the Supply Chain – Final Report for Year 1* (Ministry for Primary Industries, MPI Discussion Technical Paper No: 2018/44, July 2018) at 111

323 National Animal Welfare Advisory Committee, *Codes Review Process* (Ministry for Primary Industries, undated) at 1

324 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 7(a)

325 Minimum Standard No. 7(b)

326 Minimum Standard No 7(c)

327 Minimum Standard No 7(d)

328 National Animal Welfare Advisory Committee, above n 44, at 9

329 Interview with Shane Kelly, above n 37

330 Interview with Jenny Jago, above n 3

331 A.L. Legrand, M.A.G von Keyserlingk, and D.M. Weary "Preference and Usage of Pasture Versus Free-stall Housing by Lactating Dairy Cattle" (2009) 92 J Dairy Sci 3651

332 C.C. Krohn, L. Munksgaard and B. Jonasen "Behaviour of dairy cows kept in extensive (loose housing/pasture) or intensive (tie stall) environments I. Experimental procedure, facilities, time budgets - diurnal and seasonal conditions" (1992) 34 Appl. Anim. Behav. Sci 37 at 46.

studies have found that cattle will change location in response to their environment;[333] that cattle prefer to use areas protected from wind in winter;[334] and that cattle in hot conditions will seek shade.[335] In the New Zealand context, research by Karin Schutz and others at AgResearch found that "dairy cattle are highly motivated to use shade in warm weather and consider shade a valuable resource that they are willing to compete for."[336] This research also found that shade use increases with higher air temperature and solar radiation; that the provision of shade in late lactation improves milk production; that shade use is more than twice as high when all cows could access the shade simultaneously; and notes that feedlots in Australia recommend that cows should have access to a minimum of four m^2 of shade per cow.[337] Shutz *et al*. confirmed these findings, adding that cows with access to shade had lower panting scores and respiration rates than cows with no shade and that the proportion of the herd using shade increased and the proportion of cows with high panting scores decreased when more shade was provided.[338] West [339] and Kendall et al[340] confirmed that the provision of shade in high temperatures leads to an increase in milk production.

The code of welfare does not adequately provide for these needs. While the code requires all dairy cattle to be 'provided with the means to minimise the effects of adverse weather' it does not actually require shelter to be provided except in very limited circumstances (i.e. in relation to newborn calves and sick animals). Shelter is only included as a recommended best practice, which states "Shelter (e.g. windbreaks or natural topography) should be provided to protect animals from adverse weather especially cows when they are close to calving."[341]

Further, while providing for a number of ways to reduce heat loading on animals,[342] the recommended best practice section does not refer to minimising the time that dairy cattle spend in the yard, which is a key mechanism for reducing heat stress. Heat and cold stress can also be measured through automated heat detection e.g. through the use of a computerised collar.[343] This accurately measures the animal's temperature and can measure body condition score (through providing information on rumination) and let farmers know the best time for breeding so as to minimise interference with cattle. No reference is made to the use of such technologies, which could be included as a recommended best practice in the code of welfare.

The code also does not recognise that shade and shelter can mean multiple things. For example, shade could be provided by a winter barn or by a roofed shed, or by other means. As Kerry Gray of Federated farmers stated:[344]

333 I. Redbo, A. Ehrlemark, and P. Redbo-Torstensson "Behavioural responses to climatic demands of dairy heifers housed outdoors" (2001) 81 Can. J. Anim. Sci.9.

334 J.M. Beaverand B. E. Olson "Winter range use by cattle of different ages in southwestern Montana" (1997) 51 Appl. Anim. Behav. Sci. 1 and R.L. Senftand L. R. Rittenhouse "Factors influencing selection of resting sites by cattle on shortgrass steppe" (1985) 38 J. Range Manage. 295.

335 J.K. Blackshaw and A. W. Blackshaw "Heat stress in cattle and the effect of shade on production and behaviour: A review" (1994) 34 Aust. J. Exp. Agric. 285 and M. Vandenheede, B. Nicks, R. Shehi, B. Canart, I. Dufrasne, R. Biston, and P. Lecomte "Use of a shelter by grazing fattening bulls: Effect of climatic factors" (1995) 60 Anim. Sci. 81.

336 Karin Schütz "Heat Stress in Dairy Cattle" in *Welfare Pulse* (Ministry for Primary Industries, Issue 10, March 2012) at 10.

337 At 10

338 K.E. Schutz, N.R. Cox, and C.B. Tucker "A field study of the behavioural and physiological effects of varying amounts of shade for lactating cows at pasture" (2014) 97 J. Dairy Sci 3599.

339 J.W. West "Effects of Heat-Stress on Production in Dairy Cattle" (2003) 86 J. Dairy. Sci 2131

340 P.E. Kendall, P.P. Nielsen, J.R. Webster, G.A> Verkerk, R.P Littlejohn, L.R. Matthews "The effects of providing shade to lactating dairy cows in a temperate climate" (2006) 103 Livest. Sci. 148.

341 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No 7(Shelter), Recommended Best Practice (a)

342 Including the provision of plentiful drinking water; use of paddocks close to the dairy; movement of animals at their own pace; provision of water sprinklers at the dairy and in the dairy yards; provision of shade; use of sun protection formulas e.g. zinc; and once a day milking in the morning. Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 7, Recommended Best Practice (c)

343 DairyNZ "Automated heat detection" <https://www.dairynz.co.nz/milking/new-dairies-and-technology/automated-heat-detection/>

344 Interview with Kerry Gray, above n 36

> When you're talking shelter, it could be a shed at the cold end or something, the other side of the hill, a gully or the low part of the farm that is protected from the wind…[or] trees.

Similarly, a 2019 MPI-commissioned report recognised that shelter could include hedgerows, trees, gullies, flaxes, vegetation clumps, tussocks, rocks, woolsheds or rushes.[345]

Since 2013 MPI has been running the *Safeguarding our Animals, Safeguarding our Reputation* programme "with various primary industry groups to improve animal welfare through alleviating the risks of inadequate shelter to livestock welfare and productivity."[346] As an initiative under the MPI programme, Beef + Lamb NZ also published *Shelter: Maintaining the Welfare and Productivity of Sheep and Cattle On Drystock Farms* in 2016, with input from MPI, the NZ Farm Forestry Association and the New Zealand Veterinary Association. This document identified the benefits of shelter and shade as better food conversion efficiency and increased growth rates; better survival chances for lambs and calves; reduced stress on vulnerable animals (e.g. pregnant ewes and cows and sheep post-shearing); better pasture growth and utilisation; reduced drying of pastures; reduced moisture loss; and better reproductive performance.[347] Similarly, the code notes studies showing there is an increase in milk production in cows that have voluntary access to shade during hot days."[348]

Despite such initiatives, MPI has recently identified shelter on pastoral farms as an issue that still needs to be addressed.[349] So too has the former Chair of NAWAC, who has stated that the "provision of shade and shelter for outdoor grazing is still inadequate on many dairy farms."[350] Similarly, a 2019 MPI-commissioned study found that "The expectations for and provision of shelter for livestock remains a challenge",[351] and stated that the:[352]

> …provision of shelter for pastoral farmed animals has long been recommended, as well as acknowledged as a potential animal welfare issue…it remains an example of what Dwyer et al. (2016) describe as 'stubbornly unchanging'…the accumulation of knowledge does not appear to have had an impact on improving survival.

345 M.W. Fisher, W. Stockwell, A. Hastings, J.I.E Brannigan, C.E. Lyons, P. Timmer-Arends "Barriers to the adoption of animal welfare standards: shelter on pastoral farms" (2019) 79, New Zealand Journal of Animal Science and Production 37 at 38

346 Penny Timmer-Arends "Living in the shade – coping with heat" in *Welfare Pulse* (Ministry for Primary Industries, Issue 16, December 2013) at 2

347 Beef+Lamb New Zealand "Fact Sheet; Shelter; Maintaining the welfare and productivity of sheep and cattle on drystock farms" (May 2019) <beeflambnz.com/knowledge-hub/PDF/FS174-shelter> at 2

348 Code of Welfare (Dairy Cattle) 2019 at 14

349 Mark Fisher "Trees, rocks and sail-cloths: expectations for, and barriers to, the provision of shelter on pastoral farms" in *Welfare Pulse* (Ministry for Primary Industries, Issue 25, July 2018) at 2 – 3

350 John Hellström "Sustainable Intensification – an Oxymoron?" in *Welfare Pulse* (Ministry for Primary Industries, Issue 16, December 2013) at 10

351 Fisher et al, above n 346, at 37

352 At 37

In particular, the study considered that "livestock exposed to wind, adverse heat and solar radiation, and to excessive mud, probably stand out as needing to be addressed sooner rather than later."[353]

Amending the code so that the provision of shelter is mandatory would address the issues outlined above. This is evidently necessary, as MPI-led and industry initiatives have not managed to solve this issue through education alone. Clearly, the vague minimum standard outlined in the current code of welfare requiring dairy cattle to have the "means to minimise the effects of adverse weather"[354] has proved insufficient to ensure these animals have adequate access to shelter. That the code does not require dairy cattle to be given access to shelter is also contrary to s 4(b) of the Act, which includes adequate shelter in the definition of 'physical, health and behavioural needs' in relation to animals.[355]

4.2.1 EXTREME WEATHER EVENTS

Floods, storms and droughts are discussed at Part 5.2 of the code, and the code contains a number of recommended best practice standards in order to mitigate the effects of these. However, the code does not require farmers to have contingency plans in relation to extreme weather events. This is in contrast to the recently introduced minimum standard 9 (Managing Dairy Cattle in Off-Paddock Facilities), which provides that "A contingency plan, containing fire prevention measures, emergency evacuation procedures, and pest and disease management plans, must be in place."[356]

This is problematic given that industry itself considers this a significant issue. Kerry Gray of Federated Farmers stated, "Where I think the pinch points are [for animal welfare] is during adversity."[357] Gray noted that industry does "have emergency response around this sort of thing."[358] However, again, contingency plans are not required by the code and this should be addressed.

353 Fisher et al, above n 346, at 41
354 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 7(a)
355 Animal Welfare Act 1999, 4(b)
356 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 9(a)(vi)
357 Interview with Kerry Gray, above n 36
358 Interview with Kerry Gray

4.3 WINTER GRAZING

The code of welfare generally provides that dairy cattle must have access to areas free of surface water and mud;[359] protection from adverse weather;[360] and that they must be able to lie down and rest comfortably for sufficient periods to meet their behavioural needs.[361] However, winter grazing and the issues associated with it are not specifically addressed in the Code of Welfare (Dairy Cattle) 2019.

Winter grazing involves animals being fed during the winter period on forage, such as pasture or crop. Animals are kept on a measured area of forage and once they have finished grazing, are moved to another strip of forage.[362] Typically it involves holding animals at a higher stocking density, and is:[363]

> …used in pastoral farming to manage feed supply at a time of year when pasture growth is limited by cool temperatures and short day length. Relatively large amounts of surplus rainfall occur at this time of year and intensive winter grazing systems help to preserve soil structure and pasture quality on other parts of the farm.

MPI'S WINTER GRAZING TASKFORCE

Winter grazing has recently been identified by MPI as an animal welfare issue for dairy cattle, with cows being kept in excessively muddy and wet conditions for prolonged durations. MPI formed a 'Winter Grazing Taskforce' to investigate this, which released a report on this topic in 2019.[364] The Taskforce identified numerous animal welfare issues associated with winter grazing, including poor hoof health leading to claw lesions and lameness; increased risk of mastitis; birthing in mud; reduced lying time and poor quality of lying and sleep; reduced ability to ruminate; malnutrition and underfeeding; dehydration; cold and heat stress; lack of choice for lying site, fodder choice and social interactions; negative social interactions at high density (e.g. competition for feed, water and lying spaces); nutritional or metabolic problems; injury caused by fencing and equipment including fractures and broken legs due to mud; dental problems; and death resulting from misadventure, exposure or acute metabolic incidents.[365]

The Taskforce considered that in relation to winter grazing, animals should never be giving birth on mud and that avoidable deaths in adverse weather events and mass mortality events on winter grazing systems should never happen.[366] Additionally, cows should always be able to lie down comfortably (on a soft dry substrate) for as long as they want; there should always be an ability to readily move animals to shelter/dry land in adverse weather before harm occurs; there should be continuous convenient access to fresh, clean water; and animals should always have access to an adequately balanced diet "that keeps animals warm and doesn't cause acute or chronic malnutrition or metabolic problems."[367] The

359 Although no minimum standard explicitly states this, Minimum Standard No 6 provides that cattle "must be able to lie and rest comfortably for sufficient periods to meet their behavioural needs." Further, the Code states that cows prefer to lie on soft, dry and clean surfaces rather than hard, muddy, slipper or wet surfaces at 11. It also recognises that muddy environments are a contributing factor to lameness at 32.

360 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 7

361 Minimum Standard No. 6(b)

362 New Zealand Veterinary Association "Winter grazing" <https://www.nzva.org.nz/page/wintergrazing>"

363 Winter Grazing Taskforce, above n 1, at 1

364 Winter Grazing Taskforce, above n 1. This Taskforce consisted of Dr John Hellstrom, ONZM; Dr Arnja Dale, chief scientific officer, SPCA; Dr Helen Beattie, chief veterinary officer, New Zealand Veterinary Association; Dr Stephen Hopkinson, dairy cattle vet and New Zealand Veterinary Association; Angus Robson, environment campaigner; Dr Ross Monaghan, senior scientist, AgResearch; Elaine Cook, DairyNZ; Dave Harrison, Beef+Lamb NZ; Ewen Matheison, dairy farmer, Southland; and Pania King, sheep and beef farmer, Gisborne.

365 At 3

366 At 6

367 At 7

Taskforce considered these actions to be "absolute bottom lines",[368] and recommended "primary sector organisations, with support from rural professionals and Government, support farmers to immediately stop or start the actions identified above."[369]

The Taskforce stated that the extent of this issue is unknown, with reports to the Taskforce estimating that 5% - 20% of farmers may be implicated, with a further 30% of farmers not following best practice.[370] The Taskforce provided 11 recommendations to address this issue,[371] including the need to:[372]

> …lift standards of animal welfare outcomes in the codes of welfare and ensure specific standards are included to address known problems around food, water, mud, lying times (amount of lying and quality of lying) and shelter provision in relation to intensive winter grazing.

The Taskforce also recommended the introduction of new animal welfare regulations to address these issues. Further, the Taskforce recognised that current codes of welfare are:[373]

> …not aligned with emerging scientific understandings of sentience. There are no enforceable regulations that directly address access to water, shelter and requirements for lying, depth of mud, and proper nutrition when winter grazing.

Kerry Gray of Federated Farmers stated that the feeding issues associated with winter grazing are not the sole responsibility of farmers, and "as much the responsibility of the person selling that feed to the farmer [to] be engaged and actually understand the limitations of each feed."[374] This is substantiated by Judson *et al*, who found in 2010 that cows struggle to achieve body condition scores during winter and that this is in part due to the inability of cows to gain weight on winter brassica crops due to low dry matter intake (potentially due to poor crop utilisation or inaccurate allocation of forage) and/or poor crop and diet quality.[375] Dr John Hellstrom recently stated on Rural News, "Seed merchants don't realise that the advice they give farmers on where to put crops and which crop to use has huge animal welfare implications."[376] The Taskforce recognised that "seed merchants don't consider animal welfare when giving cropping advice"[377] and that "it will take a concerted effort along the supply chain to improve animal welfare in winter grazing systems."[378] The Taskforce also identified other actors who also need to be held accountable, including financial institutions, supply and advisory services, rural contractors and support services, graziers, veterinarians and individuals at the farm management and governance level.[379] The role these

368 At 7
369 At 7
370 At 2
371 These included recommendations to conduct further work in this area so as to understand and mitigate the long-term animal welfare consequences of this practice; to establish baselines in order to monitor progress of improvements; to utilise and expand on existing knowledge as regards barriers to improving animal welfare; to finalise a detailed whole-of-supply-chain process map; to identify gaps in information transfer; animal welfare being a part of farm planning alongside environmental management; MPI taking steps to implement change immediately as regards compliance and enforcement; participants in the supply chain identifying practical options to adapt support tools (e.g. contract templates including reference to animal welfare obligations); that key research projects should incorporate animal welfare performance measures; establishment of a pan-sector intensive winter grazing action group; and for MPI to lead a debrief of winter 2019 and assess progress against the Taskforce recommendations, for the Taskforce to report back to the Minister by 2020.
372 At 8
373 At 5
374 Interview with Kerry Gray, above n 36
375 H.G. Judson, D.E. Dalley, G.R. Edwards, D.R. Stevens and S.J. Gibbs "Improving winter feeding outcomes in South Island dairy herds" (2010) Proceedings of the 4th Australasian Dairy Science Symposium 137
376 Peter Bourke "Winter grazing is everyone's problem" *Rural News Group* (online ed, New Zealand, 3 December 2019)
377 Winter Grazing Taskforce, above n 1, at 4
378 At 1
379 At 5

actors have within the context of winter grazing could also be incorporated into the code of welfare for dairy cattle.[380]

MPI'S WINTER GRAZING ACTION GROUP

Kate Littin informed us that NAWAC "is prioritising the review of the sheep and beef, and dairy cattle, codes of welfare to pick up on recommendations from the Winter Grazing Taskforce."[381] A Winter Grazing Action Group was formed in March 2020 to implement recommendations to improve animal welfare in winter grazing systems.[382]

4.4 OFF-PADDOCK FACILITIES

4.4.1 DELAYS IN IMPLEMENTATION OF MINIMUM STANDARDS PROVIDING GUIDANCE IN RELATION TO OFF-PADDOCK FACILITIES

In 2019 NAWAC revised the code of welfare to include minimum standards providing guidance to farmers in relation to the use of long-term housing for dairy cattle, otherwise known as 'off-paddock facilities'. The Code of Welfare (Dairy Cattle) 2019 defines an off-paddock facility as:[383]

> …a facility that incorporates a constructed base, and may or may not have a roof or walls. Off-paddock facilities include calf sheds, purpose-built housing barns for cows, stand-off areas or pads (including long-term wintering pads), and also feed pads).

These revisions to the code took a long time to be implemented, with NAWAC having identified as far back as 2012 that:[384]

> NAWAC and MPI's progress to amend the dairy cattle code of welfare to address long-term housing of cows is taking a long time. There was concern that farmers are investing in off-pasture systems without being aware of the animal welfare considerations…B Nicholas outlined the committee's concerns around dairy farmers installing housing for cows without fully considering the animal welfare outcomes and asked that [blanked out] act with urgency in the development of off-pasture guidance for farmers.

Similarly, NAWAC recognised in 2014 that there were already a number of farmers "keeping their cows indoors 365 days per year."[385] Despite this, the code was only revised to provide guidance in relation to the long-term use of off-paddock facilities in 2019.

380 For example, the Taskforce recommended a detailed whole-of-supply process map be finalised and gaps in information transfer identified and that participants in the supply chain identify practical options to implement support tools (such as contract templates) to incorporate animal welfare obligations and expectations. Such recommendations could be incorporated into the code of welfare. At 12 and 13

381 Kate Littin, above n 110

382 Hon Damien O'Connor "Winter grazing action group named" (2 March 2020) Beehive.govt.nz <https://www.beehive.govt.nz/release/winter-grazing-action-group-announced>

383 Code of Welfare (Dairy Cattle) 2019 at 15

384 National Animal Welfare Advisory Committee Minute "General Meeting" (14 November 2012) at [C 2]

385 National Animal Welfare Advisory Committee Minute "General Meeting" (14 May 2014) at [C 5]

4.4.2 DIFFERENCES BETWEEN THE CODE OF WELFARE (DAIRY CATTLE) 2019 AND CODE OF WELFARE (DAIRY CATTLE) 2018

Minimum standard 9(c)(i) of the Code of Welfare (Dairy Cattle) 2019 provides that where dairy cattle are kept in off-paddock facilities for more than 16 hours a day for more than three consecutive days, they must be provided with a "well-drained lying area with a compressible soft surface or bedding."[386] This provision reflects the fact that concrete surfaces such as those typically found in off-paddock facilities discourage cows from lying down, and accounts for the importance of exhibiting this behaviour to cows.[387] However, this new standard actually relaxes the standard prescribed by its 2018 predecessor, which provided that where cows are kept on a concrete surface for *12 hours* or more per day for three consecutive days, they had to be given at least one full day on a suitable alternative surface.[388]

The 2018 code also provided a further protection, by referring to the *kind* of surface on which dairy cattle may be kept, rather than confining its application to off-paddock facilities. Thus it did not matter whether cows were kept on a concrete surface in an off-paddock facility or outside of one, the maximum time they could stand on such a surface before having a break was 12 hours for three consecutive days. The removal of this provision from the current code is difficult to reconcile with NAWAC's previous recognition in the 2018 code that dairy cattle need to have access to soft surfaces for lying down:[389]

> Where harder surfaces, such as concrete or raceways, are used for periods of 12 hours or more each day for consecutive days, welfare will be compromised. Lameness, stiffness, agitated behaviour and weight loss are likely to occur.

4.4.3 CONCERNS REGARDING THE USE OF OFF-PADDOCK FACILITIES

There are concerns around the use of off-paddock facilities and whether the revised Code of Welfare (Dairy Cattle) 2019 will in fact adequately protect the welfare of dairy cows.

The 2019 revisions allow for cows to be kept on off-paddock facilities year-round, subject only to a recommended best practice that "mature cattle in off-paddock facilities should be given daily voluntary access to pasture or to a suitable outdoor area."[390] NAWAC considered there to be a range of benefits to off-paddock systems, including the provision of shelter; the provision of adequate feed to animals during winter; the protection of pasture during wet conditions; and a reduction in the environmental impacts of pastoral farming.[391] However, these changes have prompted concerns that the code "will pave the way for factory farming within the dairy industry in New Zealand."[392] NAWAC has similarly acknowledged that "those who set up these housing units are often brought here by international stakeholders and there is a cultural clash. New Zealanders expect to see cows outside."[393] Further, NAWAC noted in 2015 "that industries are trying to move away from this overseas."[394]

386 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 9(c)(i)
387 Further discussed by National Animal Welfare Advisory Committee *Report to accompany an amendment to the code of welfare for dairy cattle* (Ministry for Primary Industries, 31 October 2019) at 2
388 Code of Welfare (Dairy Cattle) 2018, Minimum Standard No.8, Recommended Best Practice
389 Code of Welfare (Dairy Cattle) 2018 at 14
390 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No.9, Recommended Best Practice (g)
391 National Animal Welfare Advisory Committee, above n 388, at 6
392 Green Party standard letter submission in "Animal Welfare (Dairy Cattle) Code of Welfare Amendment: Summary of Submissions from Public Consultation" at 2
393 National Animal Welfare Advisory Committee Minute "General Meeting" (14 August 2013) at [C 6]
394 National Animal Welfare Advisory Committee Minute, above n 310, at [C 4]

Jenny Jago of DairyNZ noted that only a few farmers are currently utilising off-paddock systems. She stated:[395]

> NZ dairy farmers are proud of the fact they are pasture-based, which means our cows are outside and are predominantly grass-fed. Only a handful of farmers keep their cows off paddock for the entire lactation period, with most of those keeping non-lactating cows on pasture.

While this statement indicates that a minority of farmers are utilising off-paddock systems, the new provisions in the code encourage the use of such systems, which conflict with the value farmers place on having a largely pasture-based system in New Zealand.

OFF-PADDOCK FACILITIES AND THE BEHAVIOURAL NEEDS OF DAIRY CATTLE

Kerry Gray of Federated Farmers considered that the behavioural needs of dairy cattle are provided for in such systems. She stated:[396]

> It actually doesn't matter if [farms are] pasture based or not. …there's very clear requirements for off-paddock facilities, so they can move around, they can sit down, they can stand up.

Similarly, Jenny Jago of DairyNZ stated:[397]

> The new housing amendment in the Dairy Cattle Code of Welfare (31 October 2019 code of welfare: Minimum Standard 9) recognises the natural behaviours of dairy cattle and ensures that these are maintained while animals are being kept in off-paddock facilities.

However, as the current code of welfare itself recognises:[398]

> There is evidence that cows managed in such circumstances will express a behavioural partial preference for having access to the outdoors, particularly at night time. Daily or frequent access to the outdoors, either to pasture or a high quality area when the weather is suitable (i.e. does not create welfare risks such as hyper-or hypothermia or muddy paddocks) provides dairy cattle in these systems with opportunities to express a wider range of their normal patterns of behaviour. These include, but are not limited to, freedom of movement, choice of lying area, and opportunities for exploration, grazing and foraging, lying in extended positions and positive social interactions…

Similarly, Katelaar-de Lauwere *et al*. found that dairy cows spent between 71.3% to 90.8% of their lying time at pasture rather than indoors when given the choice.[399] Shepley *et al*. found that where cows have had prior outdoor experience throughout the year, the majority chose

395 Email from Jenny Jago (Strategy and Investment Leader – Farm Performance at DairyNZ) to the author in response to the question "Some commenters have claimed that the existing indoor housing provisions under the Code of Welfare for Dairy Cattle lack any restrictions that would actually stop the factory farming of dairy cattle. Do you think this is a fair statement? And is there a risk that very intensive farming is or could take place in New Zealand in regards to dairy cattle?" (4 April 2020).

396 Interview with Kerry Gray, above n 36

397 Jenny Jago, above n 396

398 Code of Welfare (Dairy Cattle) 2019 at 16

399 C.C Ketelaar-de Lauwere, A.H. Ipema, C. Lokhorst, J.H.M. Metz, J.P.T.M. Noord-huizen, W.G.P. Schouten, A.C. Smits "Effects of sward height and distance between pasture and barn on cows' visits to an automatic milking system and other behavior." (2000) 65 Livest. Prod. Sci. 131

to remain on pasture as a group for the majority of the test period rather than remaining indoors.[400] While Charlton *et al*. found that dairy cattle preferred to go indoors almost twice as often as pasture in order to fulfil their nutritional requirements, dairy cattle in this study still elected to go to pasture and the authors emphasised that "this partial preference does not mean that pasture is not important for the welfare of dairy cows."[401] Additionally, the authors noted numerous factors, which may have influenced the cows in the study to spend more time indoors in this study.[402] And while cattle in this study frequented the indoors in order to access feed and fulfil their nutritional needs, such needs could also be fulfilled alongside the cattle's behavioural needs through providing haylage on pasture.[403] Further, Charlton *et al*. found that where cows had been reared outdoors with previous pasture access and taken to a point equidistant between indoors and pasture, they expressed a 71% partial preference for pasture (although more time was spent indoors when cows were lame).[404]

Some studies have found that cattle preferences vary depending on the weather. For example, Legrand *et al*. found that dairy cattle preferred pasture at night, and access to indoor housing during the day when temperature and humidity increased. Overall the authors found that cattle preferred an outdoor environment 54% of the time (although the cattle in this study had a lack of experience with the outdoors, which may have led to greater use of the indoor facilities).[405] Krohn *et al*. reported pasture as the preferred lying place for dairy cows, with cows preferring indoor straw housing with deep bedding during winter, but overall spending 72% of their time outdoors.[406] Shepley *et al*. similarly found a reduction in the use of pasture by a group of dairy cattle during severe snowstorm, although it also found that "when given the choice, most cows chose to be outside and when outside, cows would display a normal range of activities such as lying and feeding."[407] While these studies recognise that cattle prefer to use shelter in adverse weather conditions, they do not negate the fact that dairy cattle do use pasture and in many instances and conditions prefer it to an indoor environment.

HEALTH BENEFITS OF ACCESS TO THE OUTDOORS

There is also a range of health benefits for dairy cattle in having access to pasture. Olmos *et al*. found that cows raised in pasture systems have less severe hoof disorders and a reduced risk of poor locomotion, and have longer undisrupted lying times than cows in a housed system (which could result in welfare benefits).[408] Conversely, Charlton *et al*. stated:[409]

> …indoor housing systems raise concerns that reduced space allowance increases aggression within the herd (DeVries et al., 2004), restricts natural foraging behaviour and the opportunity to eat

400 National Animal Welfare Advisory Committee, above n 388, at 10 citing Shepley E, Bergeron R and Vasseur E. "Daytime summer access to pasture vs. free-stall barn in dairy cows with year-long outdoor experience: A case study." (2017) 192 Appl. Anim. Behav. Sci. 10

401 Gemma L Charlton, Steven Mark Rutter, Martyn East, and Liam A Sinclair "Preference of dairy cows: Indoor cubicle housing with access to a total mixed ration vs. access to pasture" (2011) 130 Appl. Anim. Behav. Sci.1 at 1.

402 Including the fact that the cows were original reared in doors; rainfall; that these cows had a high milk yield and therefore higher nutritional requirements that could be better met through consuming a total mixed ration (TMR) indoors; that TMR was available ad libitum indoors; that access for 8 cows to 12 cubicles indoors may have been generous compared to typical commercial stocking density levels and the relatively significant distance between indoor housing and pasture being 96m. At 7

403 National Animal Welfare Advisory Committee, above n 388, at 10 citing Shepley E, Bergeron R and Vasseur E. "Daytime summer access to pasture vs. free-stall barn in dairy cows with year-long outdoor experience: A case study" (2017) 192 Appl. Anim. Behav. Sci.10 at 13.

404 Charlton et al, above n 402

405 Legrand et al, above n 332

406 Krohn et al, above n 333, at 46

407 E. Shepley, R. Bergeron, F. Bécotte, E. Vasseur "Dairy cow preference for outdoors access during winter under Eastern Canada climatic conditions" (2016)97 Can. J. Anim. Sci. 1.

408 Gabriela Olmos, Laura Boyle, Alison Hanlon, Joe Patton, John J Murphy, and John F Mee "Hoof disorders, locomotion ability and lying times of cubicle-housed compared to pasture-based dairy cows" (2009) 125 Livest. Sci. 199

409 Charlton et al, above n 402, at 2

> selectively (Rutter, 2010), increases incidences of lameness and mastitis (Fregonesi and Leaver, 2001; Haskell et al., 2006) and affects cow comfort (Krohn and Munksgaard, 1993) reducing the welfare of dairy cattle.

NAWAC has recognised that there are health benefits to pasture access for cows, including a reduction in mortality rates and a reduced incidence of lameness and mastitis (assuming that the pasture is of good quality and well-maintained).[410] NAWAC has also acknowledged that access to the outdoors better enables dairy cattle to walk and exercise on soft surfaces free of effluent accumulation, which is important in reducing the incidence of claw horn weakness, infectious forms of foot disease and metabolic and digestive disorders, and in promoting good blood circulation and developing the muscular system.[411] Walking is also an important behavioural requirement, with cows being motivated to walk.[412] Such behaviour may be compromised through the relative lack of space provided for in an off-paddock facility.

Off-paddock facilities are also associated with a greater risk of disease spread, with NAWAC noting that disease "can spread very quickly in cows confined at close quarters.[413] To address this, NAWAC included a provision in the code requiring farmers to have a contingency plan containing pest and disease management plans.[414] However, such contingency planning does not change the fact that cows are at greater risk of disease spread within this context. Additionally, NAWAC has recognised that a transition towards off-paddock facilities in New Zealand could "lead to a potential increase in the incidence of lameness and mastitis and other problems, such as hock lesions"[415] and that:[416]

> …incidence of lameness in countries where housing cows is common is reportedly higher than in New Zealand's pasture-based systems (Chesterton et al., 2008)…[and housing] cows for longer periods of the year increases the prevalence of lameness. Rutherford et al. (2009) reported that cows grazed for 9 months each year had a 6% prevalence of lameness, while those grazed for only 5 months each year had a prevalence of 29%.

Similarly, NAWAC has recognised that the incidence of mastitis, skin lesions, swelling of the hocks and knees and swollen pasterns are more common in housed cows.[417] Strategies have been included in the code to minimise the risk of these health problems, such as minimum standards ensuring the provision of a well-drained lying area with a comfortable surface or bedding, and a recommended best practice that bedding should be checked daily and topped up as required.[418] NAWAC also noted that animals raised on pasture are not free from lameness, mastitis or other disease.[419] However, as NAWAC recognised in its report, the science indicates that dairy cattle within an off-paddock environment are at a greater risk of experiencing such health issues than those raised in pastoral systems.[420]

410 National Animal Welfare Advisory Committee, above n 388, at 11
411 At 8
412 I. Veissier, S. Andanson, H. Dubroeucq, D. Pomies, "The motivation of cows to walk as thwarted by tethering" (2008) 86 Journal of animal Science 2723 at 2723
413 National Animal Welfare Advisory Committee, above n 388, at 17
414 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 9(a)(vi)
415 National Animal Welfare Advisory Committee, above n 388, at 17
416 At 17
417 At 18
418 At 18
419 At 18
420 At 17 – 18

LACK OF EXPERTISE IN RELATION TO MANAGEMENT OF OFF-PADDOCK FACILITIES

Finally, an additional concern regarding off-paddock systems is a lack of expertise in relation to their management. NAWAC has recognised that the knowledge of off-paddock systems in relation to dairy cattle "is limited in New Zealand and dairy producers have voiced concerns that there is a lack of knowledgeable staff in our expanding dairy industry..."[421] This is concerning as stock handlers in this context have to be able to:[422]

- recognise cows that are not adapting to the off-paddock system (e.g. cows that do not lie down for long enough, eat well or become lame);
- prevent disease spread (which is a risk within this more closely confined environment);
- mitigate animal welfare concerns in individual animals;
- ensure that dairy cattle are clean and therefore at lower risk for lameness and mastitis; and
- potentially also assess feed quality and hoof health.

4.4.4 PROPOSAL TO INCLUDE MANDATORY REQUIREMENTS FOR ACCESS TO THE OUTDOORS IN OFF-PADDOCK SYSTEMS

NAWAC chair Dr Gwyneth Verkerk has stated that NAWAC wants "dairy cattle that are housed long-term to have access to outdoors, but affected farmers have time to comply".[423] Similarly, NAWAC's report to the amended code advised that the amended code:[424]

> …does not contain the minimum standards relating to outdoor access as recommended by NAWAC. The Ministry for Primary Industries will work with NAWAC to progress these minimum standards with a delayed commencement date for the provision of outdoor access.

It remains to be seen what future provisions regarding outdoor access will look like and when they will be implemented. But it seems likely that these future provisions will not require cows to have access to pasture – as NAWAC outlined in its report, dairy cattle would simply have to have access to a:[425]

> …suitable outdoor area…[with] a soft compressible surface and sufficient space that allows a wide range of normal patterns of behaviour including the ability to exercise on soft non-slip surfaces, freedom to choose when to lie down, space and soft surfaces for lying in a range of normal lying positions, and space for grooming and for avoiding aggressive interactions.

NAWAC has acknowledged "cattle prefer pasture access under certain conditions and are motivated to access pasture."[426] However it considered that the scientific understanding of what motivates dairy cattle to access pasture is limited, and that this justified its approach in not requiring such access. This reasoning is problematic, as even if our understanding of what motivates dairy cattle to access pasture is uncertain (because the science is limited), NAWAC should still take an approach that minimises harm and which is based on the purpose of the Act to meet the physical, health and behavioural needs of animals. The mere fact that dairy cattle have indicated a preference for pasture suggests that this could be associated with physical, health and/or behavioural need(s). At the very least, prolonged frustration of this preference can be expected to impede quality of life.

421 At 19
422 At 19
423 Sudesh Kissun "Keeping cows comfortable off-paddock" *Rural News* (online ed, New Zealand, 25 Nov 2019).
424 National Animal Welfare Advisory Committee, above n 388, at 1
425 At 9
426 At 14

Additionally, the studies we have reviewed clearly demonstrate that dairy cattle do prefer pasture to alternative 'suitable outdoor areas' i.e. feedlots (being an area or building without pasture). For example, Lee *et al*. found that cattle given access to pasture to graze or a feedlot (with no shelter, shade or trees provided in either environment) spent 75% of their time at pasture, returning to the feedlot to meet their nutritional needs.[427] It is also unclear that such alternative outdoor environments will provide cattle with the same benefits as pasture-based systems so as to meet their physical, health and behavioural needs, including in relation to space, grazing and foraging, and reduced lameness and mastitis.

4.4.5 OFF-PADDOCK FACILITIES AND THE PROVISION OF SHELTER

The tension between the use of off-paddock facilities and the issues of shelter and shade for dairy cattle has led MPI to observe that some farmers feel victimized in these discussions.[428] For example, housing is "applauded because it provides shelter and also vilified as the antithesis of natural and traditional farming and likely to impact on NZ's image."[429] While this report identifies issues with the use of off-paddock facilities, we do not recommend a total ban on such facilities where they can provide adequate shelter and shade to dairy cattle during climatic extremes. However, such facilities cannot be used to the exclusion of pasture, and ideally dairy cows should have some choice in whether or not to access shade and shelter - rather than being kept in off-paddock facilities by default.

427 C. Lee, A. D. Fisher, I. G. Colditz, J. M. Lea, D. M. Ferguson, "Preference of beef cattle for feedlot or pasture environments" (2013) 145 Appl. Anim. Behav. Sci. 53. The authors note that these cattle were raised on pasture and this may also have influenced their preferences.

428 Fisher et al, above n 346, at 40.

429 At 40

4.5 MAXIMUM STOCKING DENSITIES

While the importance of appropriate stocking densities is recognised throughout the code,[430] there are no provisions outlining what these should be in relation to dairy cattle.

In its report to the 2019 amendment to the code, NAWAC stated that the outcomes-based approach of the code accounts for this. For example, minimum standard 6 provides for the behaviours that dairy cattle are required to be able to express and this 'outcome' therefore does not need to be addressed through specifying exact stocking densities. NAWAC also stated that:[431]

> …setting stocking densities for animals that can vary in size according to breed, age and productive stage (e.g. cows in calf may require more space than cows which are not gestating) has the potential for worse welfare outcomes for the cattle.

However, the NAWAC report does not articulate exactly *how* this could contribute to worse welfare outcomes for cattle and there does not seem to be any apparent reason why a calculation like the one used for determining the space required for pigs could not be used in relation to dairy cattle, to account for their variation in size.[432]

Moreover, the failure to address stocking densities explicitly in the code, thereby depriving farmers of clear guidance as to what is acceptable, may allow for a huge variety in stocking densities. For example:

- DairyNZ has provided guidance in stocking densities for loose-housed systems at 6 – 8m^2 per adult cow in integrated paddock and housed systems and 9 - 11m^2 in a wintering system or other long term use.[433]
- Ngāi Tahu Farming compared its stocking densities to a traditional Canterbury model of 4 – 4.5 cows to the hectare (i.e. 2,500 m^2 – 2,222 m^2 per adult cow).[434]
- When raised in a pastoral farming system, DairyNZ advised that the average stocking density on one of its farms would be 2.8 cows per hectare (i.e. 3571 m^2 per adult cow).[435]
- Ngāi Tahu Farming considered that it is not heavily stocked with approximately 3.2 cows to the hectare (i.e. 3,125 m^2 per adult cow).[436]

As these examples demonstrate, there appears to be significant diversity in stocking densities used,and this could mean that inappropriately high stocking densities are being used in some instances. This is problematic as high stocking densities have a range of welfare implications for dairy cattle. For example, cows "spend less time lying as stocking density increases"[437] and high stocking densities "can lead to increased levels of aggression."[438] DairyNZ have identified further issues with high stocking rates being

430 Code of Welfare (Dairy Cattle) 2019, Example Indicators, Minimum Standard No. 6 ("Stocking density, lying surface and area allocated for lying (including stall size) are sufficient for dairy cattle to lie in a normal posture… Stocking density and herd size are appropriate for the facilities"); Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 9(d)(i). ("The stocking density and facility design and management must allow dairy cows to separate themselves for calving, or they must be separated to another area for calving").

431 National Animal Welfare Advisory Committee, above n 388, at 15

432 Code of Welfare (Pigs) 2018, Minimum Standard No 6(c). This calculation is: Area (m2) per pig = 0.03 x liveweight0.67 (kg)

433 Dairy NZ *Dairy cow housing* (Dairy NZ Limited and Ministry for Primary Industries, 2019) at 14

434 Interview with Shane Kelly, above n 37

435 Dairy NZ "Dairy sector quickfacts" <https://www.dairynznewslink.co.nz/wp-content/uploads/2020/01/Dairy-sector-quick-facts-2019-newslink-1-2.pdf> Email from Jenny Jago (Strategy and Investment Leader – Farm Performance at DairyNZ) to the author regarding this report (4 April 2020).

436 Interview with Shane Kelly, above n 37

437 National Animal Welfare Advisory Committee, above n 388, at 7

438 At 15

reduced air quality; impaired vision and observation by staff; increased risk of spreading infectious diseases; impaired observation of heat detection; poor quality lying area; and impaired access to feed and water.[439]

The Animal Welfare (Care and Procedure) Regulations 2018 suffer from the same problem. Regulation 10 states that shelter must be provided for young calves before transport and at points of sale or slaughter and that in this shelter calves must be able to stand up and lie down, but the regulations do not specify the stocking densities of these shelters or that calves should be able to move around.

The guidance that the code provides on stocking densities is so inadequate, *critics* have claimed that the code of welfare "lacks restrictions that would actually stop the factory farming of dairy cows."[440] Kerry Gray of Federated Farmers considered this "perhaps a bit of scaremongering… I just don't see factory farming happening in New Zealand. It's not something that anybody would really have an appetite for."[441] She noted also that the cost involved in factory farming in New Zealand (e.g. in obtaining the necessary resource consents) would be prohibitive, and that:[442]

> …it would be hard to think of a situation where it would be more cost-effective or more financially beneficially to do a factory farm situation…the reason why we rely so heavily on pasture is that it's low cost and that's our competitive advantage to the rest of the world.

Despite this, it is clear that some farmers in New Zealand are electing to use off-paddock systems that are more intensive compared to New Zealand's traditional pastoral farming systems. This concern also does not seem to be misplaced given the intensive factory-style farming operations that are the norm for pigs and chickens in New Zealand, as well as the fact that Fonterra operates numerous factory dairy farms around the world (e.g. in China).[443] This must be addressed by the code.

439 Dairy NZ, above n 434, at 10

440 Gillian Coumbe "Beyond Charlotte's Web - the blight of factory farming: An argument for law reform" (paper presented to Auckland Women Lawyers' Association seminar "Female of the Species. Women in Animal Law" Auckland, March 2015), at 3, footnote 7.

441 Interview with Kerry Gray, above n 36

442 Interview with Kerry Gray

443 Lewis Bollard "Global Approaches to Regulating Farm Animal Welfare" in G. Steier and K. K. Patel (eds) *International Farm Animal, Wildlife and Food Safety Law* (Springer, Switzerland, 2017) at 88

4.6 VENTILATION

Minimum standard 9(a)(iv) (Off-Paddock Facilities) provides "If ammonia levels of 25 ppm or more are detected at animal level, immediate action must be taken to reduce ammonia levels." The code's recommended best practice provides "Ammonia levels should be maintained at less than 15 ppm."[444] However, Herbut *et al*. identified levels higher than 20 ppm as harmful[445] - this is a level 20% below the mandatory minimum standard.

There was no discussion on this in NAWAC's report to the original code of welfare,[446] nor in its report accompanying the 2019 amendment.[447] Additionally, research on this point appears to be limited and further work is required to establish appropriate ammonia levels for dairy cattle.

It is also unclear how exactly ammonia on dairy farms is measured and whether farmers are actually measuring this on a regular basis. The code of welfare states in the 'General Information' section of minimum standard 9 (Managing Dairy Cattle in Off-Paddock Facilities):[448]

> As a guide, a level of 10-15ppm of ammonia in the air can be detected by smell and an ammonia at concentration above 25ppm will cause eye and nasal irritation in people. In general, if the level of noxious gases is uncomfortable to people, it will also be uncomfortable for cattle.

However, this is obviously not a precise means of measuring ammonia concentration. Additionally, the code does not require farmers to measure this regularly or to document their measurements. This could be addressed in the code of welfare.

444 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 9, Recommended Best Practice (d)

445 P. Herbut, S. Angrecka, "Ammonia concentrations in a free-stall dairy barn" (2014) 14 Ann. Anim. Sci., 153 citing Scottish Farm Buildings Investigation Unit, Report of *Working Group on Climatization of Animal Houses* (Scottaspress Publishers Limited, Aberdeen, 1984) 72 at 29

446 National Animal Welfare Advisory Committee, above n 44

447 National Animal Welfare Advisory Committee, above n 388

448 Code of Welfare (Dairy Cattle) 2019 at 18

4.7 OTHER BEHAVIOURAL NEEDS

Minimum standard 6 (Providing for Behavioural Needs) provides that dairy cattle "must be able to walk, turn around, lie in a natural position, lie down and rise freely, and express normal feeding behaviour and appropriate social interactions"[449] and that "Dairy cattle must be able to lie and rest comfortably for sufficient periods to meet their behavioural needs."[450]

The introduction to minimum standard 6 states that in all cases dairy cattle need to be able to perform a range of other behaviours such as grooming, playing, grazing, feeding, foraging to explore, select and consume feed, rumination and maternal behaviours (such as isolating cows for calving).[451] However, these are not included as minimum standards in the code, effectively making them optional. The importance of these further behaviours is generally well accepted.

4.7.1 LYING

Minimum Standard 6 states that cattle "must be able to lie and rest comfortably for sufficient periods to meet their behavioural needs."[452] NAWAC recognised the importance of this in its report to the original Code of Welfare (Dairy Cattle) 2010, which stated:[453]

> The amount of time spent lying down resting by dairy cows makes a significant contribution to their comfort and welfare. NAWAC recognises that floor characteristics and spacing allowances are important components of what provides a comfortable area for cows to lie down.

NAWAC stated in the 'General Information' section of the 2018 code:[454]

> Research shows that cows prefer to lie down for between 8 and 13 hours each day and that the welfare of cows for which lying is restricted to four hours each day, for up to four continuous days, is compromised…

This is further recognised in the Code of Welfare (Dairy Cattle) 2019: "research shows that cows prefer to lie for at least 10-12 hours per day depending on the management system."[455]

Minimum standard 6(b) provides that "Dairy cattle must be able to lie and rest comfortably for sufficient periods to meet their behavioural needs."[456] A recommended best practice for minimum standard 6 provides that under usual conditions cattle should be able to lie comfortably on a dry, clean well-bedded/ soft surface for 10-12 hours a day. However, no minimum standard has been prescribed to this effect, meaning that farmers appear free to determine what the minimum standard means when it states that cattle must be able to lie and rest comfortably for "sufficient periods to meet their behavioural needs."

Further, even if farmers elected to follow the recommended best practice, cows could still be standing on concrete or other hard surfaces for 12 – 14 hours a day before they have access to a comfortable surface to lie on. Allowing cattle to stand on concrete or other hard surfaces for 12 hours or more per day

449 Minimum Standard No. 6(a)
450 Minimum Standard No. 6(b)
451 Minimum Standard No. 6
452 Minimum Standard No. 6(b)
453 National Animal Welfare Advisory Committee, above n 44, at 12
454 Code of Welfare (Dairy Cattle) 2018 at 14
455 National Animal Welfare Advisory Committee, above n 388, at 7
456 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 6(b)

is highly problematic, given that "cows held on a concrete yard [experience] increased stress hormone levels and increased lameness."[457] As Laven and Lawrence recognised, standing on hard surfaces such as this for prolonged durations can increase the incidence of sole ulcers and digital dermatitis, leading to lameness.[458]

In contrast, Ngāi Tahu Farming has stated that it keeps its cows on concrete for up to 2 – 2.5 hours a day at most, with a further hour spent walking on lanes to and from the cow shed, with the balance of the day spent on grass.[459] Jenny Jago of DairyNZ estimated that dairy cattle on farms affiliated with DairyNZ would spend 1-3 hours a day either on a concrete pad or walking.[460]

4.7.2 PLAY

Play is an important behaviour for dairy cattle, especially for calves. As James recognised:[461]

> Scientific evidence records the importance of play behaviour in beef and dairy calves, identifying a number of possible advantages of play: it increases an animal's agility, which can be used to quickly correct balance in case of slipping or falling; it enhances an animal's ability to cope mentally with unexpected situations; and it leads to a positive emotional state. Calf play behaviour includes fast galloping, interrupted by a sudden change of direction, bucking, hind leg kicking, body rotations and twists.

Play behaviour in dairy calves has been shown to indicate positive animal welfare, with calves subjected to disbudding with pain relief showing more play behaviour three hours after the procedure than calves disbudded with no pain relief.[462]

The importance of play for calves has recently been recognised by NAWAC in its report to the 2019 amendment to the dairy cattle code of welfare in relation to the surfaces on which calves may be kept. The committee did not want to encourage the use of stones as bedding material partly because this "led to calves spending less time playing and showing a smaller repertoire of play behaviour."[463] NAWAC included reference to play in the Dairy Cattle (Code of Welfare) 2019 at minimum standard 9 in relation to off-paddock facilities under the example indicators and as a recommended best practice.[464] While NAWAC has expressly recognised the importance of play in this report in relation to off-paddock facilities, facilitating play behaviours is still not included as a minimum standard in the code. In addition, the practice of using stones for bedding in relation to calves is still an option permitted by the code.

457 National Animal Welfare Advisory Committee, above n 388, at 12

458 RA Laven and KR Lawrence "An Evaluation of the Seasonality of Veterinary Treatments for Lameness in UK Dairy Cattle" (2006) 89(10) J. Dairy Sci. 3858

459 Interview with Shane Kelly, above n 37

460 Interview with Jenny Jago, above n 3

461 Vanessa James "Recognising animal sentience: Including minimum standards for opportunities to display normal patterns of behaviour in codes of welfare in New Zealand" (LLM Research Paper, Victoria University of Wellington, 2016) at 22

462 *Welfare Pulse* (Ministry for Primary Industries, Issue 16, December 2013) at 13 citing E.M. Mintline "Play Behaviour to Indicate Animal Welfare in Dairy Calves" (2013) 144 Appl. Anim.Behav. Sci. 22

463 National Animal Welfare Advisory Committee, above n 388, at 3

464 "Calves can be seen to play", Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 9 (Managing Dairy Cattle in Off-Paddock Facilities), Example Indicator; "Calves should be kept on compressible soft bedding that is dry and clean, prevents thermal stress and provides opportunity for calves to engage in play behaviour", Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 9 (Managing Dairy Cattle in Off-Paddock Facilities), Recommended Best Practice (i)

4.7.3 GROOMING

NAWAC has acknowledged that grooming is an important behaviour for dairy cattle, which is thought to help rid them of mud, faeces, urine, insects and parasites (thereby reducing risk of disease), and which they are highly motivated to seek out.[465] This includes self-grooming (such as licking, scratching with hind feet or horns and swatting with the tail), as well as scratching on objects to reach parts of the body that are otherwise inaccessible.[466] Despite the importance of this behaviour it is not included as a behavioural need in minimum standard 6 (Providing for Behavioural Needs) or even as an example indicator of minimum standard 6 (although it is discussed in the introduction to this standard).[467]

Within the context of off-paddock facilities, social grooming is included as an example indicator of the minimum standard and it is recommended best practice that cattle in off-paddock systems be provided with devices that promote grooming.[468] However, providing for grooming is still not mandatory under this standard.

4.7.4 MATERNAL BEHAVIOURS

It is standard practice in the dairy cattle industry to remove calves from their mothers shortly after birth.[469] The code provides as a recommended best practice that "Cows should be kept out of sight, sound and smell of newly weaned calves."[470] As outlined in the Summary of Public Submissions to the Animal Welfare (Dairy Cattle) Code of Welfare 2010, this recommendation was established to recognise that:[471]

> Regard should be given to the distress suffered by cows and calves when they are separated from each other. It is a normal pattern of behaviour for mothers and calves to stay together for many months with close contact and frequent sucking.

The recommended best practice was thought to minimise this distress through encouraging the early separation of cows and calves, as it is argued that separation distress is greater the longer that cows and calves are allowed to stay together – this has also been asserted by Weary and Chua,[472] Flower and Weary,[473] and Meagher *et al*.[474]

However, this is contested. As Hudson and Mullford noted "A strong maternal bond is formed after only five minutes of contact, following calf birth."[475] Daros *et al.* stated, "numerous studies have shown that early weaning causes stress to cows, and mood depression in calves appears similar to that caused by pain following hot-iron dehorning."[476] Similarly, Rushen *et al*. found that both cow and calf can exhibit

465 National Animal Welfare Advisory Committee, above n 388, at 16
466 At 16
467 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 6 (Providing for Behavioural Needs), Introduction
468 Minimum Standard No. 9, (Managing Dairy Cattle in Off-Paddock Facilities), Example Indicator and Recommended Best Practice (h)
469 Kevin Stafford *Animal Welfare in New Zealand* (New Zealand Society of Animal Production, 2013) at 50 "… dairy calves are generally taken from cows within 12 hours of birth, and cows may show signs of extreme distress."
470 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 17, Recommended Best Practice (a)
471 Ministry for Primary Industries *Animal Welfare (Dairy Cattle) Code of Welfare Summary of Public Submissions* at 45
472 D.M. Weary and B. Chua B "Effects of early separation on the dairy cow and calf. 1: Separation at 6h, 1 day and 4 days after birth" (2000) 69 Appl. Anim. Behav. Sci. 177.
473 F.C. Flower and D.M. Weary "Effects of early separation on the dairy cow and calf. II: separation at 1 day and 2 weeks after birth" (2001) 70 Appl. Anim. Behav. Sci. 275.
474 R. K. Meagher, A. Beaver, D. M. Weary, M.a A.G. von Keyserlingk, "Invited review: A systematic review of the effects of prolonged cow-calf contact on behaviour, welfare, and productivity"(2019) 102(7) J. Dairy Sci. 5765.
475 Hudson S.J. and M. M. Mullord. "Investigations of Maternal Bonding in Dairy Cattle" (1977) 3 Applied Animal Ethology 271 at 271
476 Daros, R.R., et al. "Separation from the Dam Causes Negative Judgement Bias in Dairy Calves" (2014) 9 PLoS One e98429

altered behavioural and prolonged bellowing as a result of separation.[477] As SAFE has noted, early separation of calves from their mothers can still "create substantial distress for both mother and calf",[478] evidenced in prolonged bellowing / vocalisation by both calves and cows;[479] reduced play in calves as a result of reduced energy intake; and mood depression in calves (demonstrated by the use of a judgment bias test).[480]

Meagher *et al*. noted that allowing for longer weaning times may have multiple health benefits. They stated:[481]

> …[early separation has been seen] to reduce acute distress responses of cows and calves. However, longer cow-calf contact typically had positive longer-term effects on calves, promoting more normal social behaviour, reducing abnormal behaviour, and sometimes reducing responses to stressors… [and increasing] calf weight gains during the milk-feeding period.

Beaver *et al*. undertook a comprehensive review of the available literature and found that it does *not* indicate that early separation is advantageous to cow and calf health, with suckling being shown to be protective against mastitis.[482] Krohn et al[483] found that allowing cow and calf to stay together confers health benefits. Both Metz[484] and Flower and Weary[485] found that nursed calves gained weight faster than separated calves.

In light of these concerns, some producers (such as the Happy Cow Milk Company) have elected to raise dairy cattle in alternative systems whereby calves, both male and female, are left with their mothers until they wean naturally (at eight – 10 weeks of age).[486]

This issue is not addressed in NAWAC's report to the code and necessitates further evaluation.

4.7.5 FOOD

Meagher *et al*. recognised that providing a variety of feed for dairy cattle facilitates exploratory behaviour for some members of the herd.[487] This is not acknowledged in the code of welfare, either at minimum standard 2 (Food) or minimum standard 6 (Providing for Behavioural Needs).

477 Jeff Rushen et al. "Reduced Locomotor Play Behaviour of Dairy Calves Following Separation From the Mother Reflects Their Response to Reduced Energy Intake" (2016) 177 Appl. Anim. Behav. Sci.6.

478 SAFE "Cows" <https://safe.org.nz/our-work/animals-in-need/cows/calf-welfare/>

479 "… cows have been reported to vocalize when separated from their calves and this response increases when cow and calf have been allowed to bond for several days." T. Ede, B. Lecorps, M.A.G. von Keyserlingk, D.M. Weary "Symposium Review: Scientific assessment of affective states in dairy cattle" (2019) J. Dairy Sci. 10677-10694, citing Flower and Weary, above n 474

480 SAFE, above n 479

481 Meagher et al, above n 475, at 5765.

482 Meagher et al, above n 475

483 C.C. Krohn, J. Foldager J L. Mogensen L "Long-term effect of colostrum feeding methods on behaviour in female dairy calves" (1999) 49 Acta Agr Scand a-an 57; C.C. Krohn, B. Jonasen B and L. Munksgaard L (1990) "Cow–calf relations. 2: The effect of 0 vs. 5 days suckling on behaviour, milk production and udder health of cows in different stabling. Report No. 678." National Institute of Animal Science, Foulum, Denmark

484 J. Metz J "Productivity aspects of keeping dairy cow and calf together in the post-partum period" (1987) 16 Livest Prod Sci 385

485 Flower and Weary, above n 474

486 Happy Cow Milk Co "The Happy Cow Way" <https://happycowmilk.co.nz/happy-cow-way/>

487 R. K. Meagher, D. M. Weary, M. A.G. von Keyserlingk "Some like it varied: Individual differences in preference for feed variety in dairy heifers" (2017) 195 Appl. Anim. Behav. Sci. 8.

4.8 MIXING OF DAIRY CATTLE

Mixing of dairy cattle is addressed at part 4.2 of the code. The introduction to this section recognises that dairy cattle live in groups with established social hierarchies and that introducing new animals into the group can lead to stress and aggression.

There are two recommended best practice provisions. Recommended best practice (a) relates to keeping dairy cattle in stable social groupings as much as possible.[488] Recommended best practice (b) outlines that dairy cattle should be observed when mixing and provided with sufficient space and a non-slip surface.[489] It is unclear why these recommendations are not minimum standards in the code of welfare.

Jenny Jago of DairyNZ stated that their "advice is around keeping mixing to a minimum."[490] She said that this is with "the exception of when an animal is lame – she must come out from the herd."[491] Removing lame animals from the herd may lead to them being mixed together in a separate area so as to better facilitate their recovery. Additionally, Kerry Gray of Federated Farmers stated that cows may need to be mixed if, for example, the farmer is opting to sort out cows according to body condition score so as to better attend to the nutritional needs of thinner cows, "So, the one or two days while they're sorting out their pecking order is overshadowed by better management"[492] in regards to feeding. Neither of these recommendations are included in this part of the code in relation to the mixing of dairy cattle.

4.9 RESTRAINT

Minimum standard 12 (Restraint) provides for the way dairy cattle may be restrained. It outlines that restraint "must be applied in such a way as to minimise stress and risk of injury to the animal."[493] Regulation 47 of the Animal Welfare (Care and Procedures) Regulations 2018 similarly provides that the owner of and every person in charge of an animal must ensure that any collar or tether on the animal does not cause a cut that bleeds or discharges; cause a skin abrasion that bleeds or discharges; cause swelling; or prevent the animal from breathing normally, panting or drinking.

Minimum standard 12 includes as a best practice recommendation that those operating restraint equipment should be "fully conversant with safe operating procedures"[494] and that "electroimmobilisation should only be used on adult dairy cattle."[495] It is unclear why these were not prescribed as minimum standards, especially as NAWAC recognised in the code that "Electroimmobilisation devices do not block pain and may be aversive to animals. NAWAC has recommended that they be declared restricted devices."[496]

488 "Dairy cattle should be kept in stable social groupings as much as practicable and the introduction of new animals into the herd should not occur more frequently than is necessary, because of the social stress involved as the introduced and resident dairy cattle re-establish a hierarchy." Code of Welfare (Dairy Cattle) 2019, Part 4.2, Recommended Best Practice (a)

489 "When mixing groups of unfamiliar animals, or introducing new animals to a stable social group, or when releasing cattle from long periods spent in an off-paddock facility, animals should be observed until settled and monitored for signs of continuing aggression. Dairy cattle should be provided with sufficient area and with a non-slip surface, so that newcomers can move into free space if displaced or physically pushed or butted by the other animals." Part 4.2, Recommended Best Practice (b)

490 Interview with Jenny Jago, above n 3

491 Interview with Jenny Jago

492 Interview with Kerry Gray, above n 36

493 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 12(a)

494 Minimum Standard No. 12, Recommended Best Practice (a)

495 Minimum Standard No. 12, Recommended Best Practice (b)

496 At 22

Additionally, neither the code of welfare, nor regulation 47, limits how long a dairy cow can be tethered. This is problematic, as Moran and Doyle found:[497]

> …ambulatory stereotypic behaviours develop as a result of tethering. Tethered cattle show pacing and swaying behaviours, suggesting frustrations with an inability to move. Swaying is particularly prevalent and has been reported in up to 20% of the tethered herd (Blaszak 2011)…Research has shown that a combination of oral and ambulatory stereotypies have been found to occur in previously grazed cows that were then continuously tethered over many months (Albright and Arave 1997). These behaviours were linked to frustration resulting from a greatly reduced opportunity for activity (walking) along with reduced psychological and physiological contacts and the manipulation and processing of their feed.

Further, minimum standard 12 only requires such animals to be inspected every twelve hours.[498] World Animal Protection considers this to be "a really long time."[499]

4.10 USE OF ELECTRIC PRODDERS AND GOADS

Regulation 48 of the Animal Welfare (Care and Procedures) Regulations 2018 permits the use of electric prodders on cattle that weigh over 150 kg. It allows that the prodder may be used only on the muscled areas of the animal's hindquarters or forequarters and requires that the animal must have sufficient room to move away from the prodder. However, it is clear that the use of such instruments cause dairy cattle to suffer. For instance, Grandin found that the use of electric prodders resulted in vocalisations from cattle, with previous research indicating that such vocalisations are an indicator of stress.[500]

The Code of Welfare (Dairy Cattle) 2019 includes as a recommended best practice that electric prodders should not be applied for more than one second at any one time and if the desired effect is not achieved after four or five attempts, its use should be discontinued.[501] However, this limitation should be a mandatory requirement rather than simply a recommendation. The Humane Slaughter Association further recommends that multiple applications should be adequately spaced – this is also not a requirement in the regulation or code of welfare.[502]

Regulation 49 further provides that a person must not "strike or prod an animal with a goad in the udder, anus, genitals or eyes." A goad is a spiked stick used to encourage an animal to move. Grandin also recommended against the use of such prodders on the ears and nose,[503] however prodding these sensitive areas is not prohibited under regulation 49.

497 John Moran and Rebecca Doyle "Cattle Behaviour" in *Cow Talk: Understanding Dairy Cow Behaviour to Improve Their Welfare on Asian Farms* (Csiro Publishing, Australia, 2015) at 47.

498 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 12(e)

499 Animal Protection Index "New Zealand: ranking C" (2020) at 16

500 T. Grandin "The feasibility of using vocalization scoring as an indicator of poor welfare during cattle slaughter" (1998) 56 Appl. Anim. Behav. Sci. 121.

501 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 10, (Stock Handling), Recommended Best Practice (d)

502 Humane Slaughter Association "Humane Handling of Livestock" (2016)

503 T. Grandin "Good Management Practices for Animal Handling and Stunning" (1990) and in T. Grandin "AMI Meat Institute Foundation: Good Management Practices for Animal Handling and Stunning (2nd Edition, American Meat Institute Foundation)

4.11 DRYING OFF

At the end of lactation, dairy cattle require a drying off period to allow udder tissue to repair. This involves shutting down milk secretion and sealing the teat canal as quickly as possible, usually through feed restriction.[504]

The code addresses drying off at part 6.6. The introduction to this section recognises that drying-off may increase udder pressure in high yielding cows and increase the risk of mastitis, thus cows need to be carefully managed during this time.[505] It also provides a number of provisions in the recommended best practice section.

The NAWAC report discussed the science in relation to drying off and stated:[506]

> These findings form the basis for best practice management for drying off cows that are producing in excess of 10L milk per day i.e., to reduce feed intake to maintenance levels from 2-3 days before drying off until 7 days afterwards (Managing Mastitis – a practical guide for NZ dairy farmers).

The report also referenced scientific literature, which recommended milking once or twice daily until drying off.[507] However, these findings are not been prescribed as minimum standards but are included only as recommended best practice.

DairyNZ has made various recommendations to reduce mastitis[508] on its website, including spraying teats with disinfectant during the dry-off period;[509] drying-off cows if milk yield falls below 5L a day;[510] and maintaining the same milking frequency up until dry off.[511] None of these recommendations have been captured by the code.

504 Dairy NZ "Dry Off Abruptly" <https://www.dairynz.co.nz/animal/cow-health/mastitis/drying-off/drying-off/>
505 Code of Welfare (Dairy Cattle) 2019 at 24
506 National Animal Welfare Advisory Committee, above n 44, at 14
507 At 14. "A further study reported by Lacy-Hulbert et al. (1999) compared the effect of milking every-other-day with once or twice daily milking until drying off. Cows that were milked every other day had significantly higher SCC and increased levels of clinical mastitis infection. Consequently every-other-day milking is not recommended as a means to reduce milk production before drying off."
508 Mastitis is "an inflammatory reaction of the udder tissue." AgriHealth "Mastitis" <https://agrihealth.co.nz/products/mastitis>.
509 Dairy NZ, above n 505
510 SmartSAMM "Dry off abruptly taking steps to reduce yield" (Dairy NZ, Technote 16, May 2012)
511 SmartSAMM

4.12 CALVING IN DAIRY CATTLE

Pregnancy examinations are provided for at part 6.12 of the code of welfare. The section only contains one recommended best practice, that "Pregnancy examinations should only be undertaken by trained and competent operators."[512] It is unclear why this is not prescribed as a minimum standard, given that the introduction to this section recognises the potential "for rectal perforation that can compromise welfare and cause death"[513] – this risk can only be exacerbated by allowing inadequately trained or incompetent operators to conduct pregnancy examinations.

In addition, dystocia (the slow and/or difficult birthing of a calf to a cow) is a significant issue associated with calving. Holmes *et al*. estimated that the incidence of this could be as high as 10-15% in New Zealand.[514] As Knight stated:[515]

> The pain or distress experienced by such mothers and calves can be substantial. Sometimes veterinarians or farmers may assist, but not always, especially in large herds (Mee; Stafford, 'Welfare Implications'). Birthing difficulties can also damage hind leg nerves, resulting in 'downer' cows who are unable to rise. If these cows do not recover, they will die. When birthing is unsuccessful, the cow initially experiences great distress, followed by depression. The fetus will die and decompose, which can lead to the death of the mother.

Adequate supervision and competent assistance during dystocia is clearly important to safeguard welfare of mother and calf. Given this, it should be mandatory for pregnancy examinations to be undertaken by trained and competent operators. In addition, the code of welfare could specifically address the issue of dystocia and how this may be addressed.

4.12.1 INDUCTION

Additionally, the code and NAWAC's 2010 report both refer to induction, being the stimulation of calving before full term. Induction was the subject of significant media controversy in New Zealand in 2010, as this process lead to premature calves being either born dead or being put down.[516]

The code states in the introduction to minimum standard 15 (Calving in Dairy Cattle):[517]

> NAWAC does not support the use of induction of otherwise healthy cows in order to manipulate calving patterns because it has the potential to affect the welfare of both cow and calf adversely.

In a recent set of minutes NAWAC noted:[518]

> …the industry has officially stated that no cattle are to be induced unless it is needed for an individual animal for animal welfare reasons. The practice of routine induction has ended in New Zealand.

512 Code of Welfare (Dairy Cattle) 2019, Section 6.12, Recommended Best Practice (a)
513 Code of Welfare (Dairy Cattle) 2019
514 CW Holmes, I.M. Brookes, D.J. Garrick, D.D.S. MacKenzie, T.J. Parkinson and G.F. Wilson *Milk Production from Pasture: Principles and Practices* (Massey University Press, 2007)
515 Andrew Knight "Should New Zealand do more to uphold animal welfare?" (2020) 114 Animal Studies Journal 9(1)
516 "Organic dairy farmers don't abort calves" *Scoop* (online ed, New Zealand, 2 August 2010); "Induction of dairy calves 'can't be banned overnight'" *Radio NZ* (online ed, New Zealand, 3 August 2010); "Minister fears induced births in dairy herds could hurt NZ" *ODT* (online ed, New Zealand, 3 August 2010); Tony Chaston "Dairy boss in calving strife" *Rural News* (online ed, New Zealand 28 September 2010); "Inducing controversy" Stuff (online ed, New Zealand, 11 October 2010); "Induction ban no biggie – vet" *Rural News* (online ed, New Zealand, 15 September 2015).
517 Code of Welfare (Dairy Cattle) 2019 at 24
518 National Animal Welfare Advisory Committee Minute "General Meeting" (22 May 2019) at [O7]

However, the only significant limitation prescribed by the code for the use of induction is the requirement that it be conducted under the direct supervision of a veterinarian.[519] The Veterinary Council of New Zealand has released a set of operational guidelines, which provided for the phasing out of induction from 1 June 2010[520] and its website states that it does "not support the routine induction of parturition in dairy cattle."[521] Given this, the code should include as a minimum standard the requirement that inductions not be undertaken to manipulate calving patterns, and may only be used to treat particular health problems in individuals. Such a requirement could also have been included in the recent suite of regulations pertaining to surgical procedures, being the Animal Welfare (Care and Procedures) Amendment Regulations 2020. Indeed, in 2015 NAWAC proposed to "prohibit induction with an exemption clause unless under supervision of a vet,"[522] however this was never followed up on.

4.13 LAMENESS

Part 7.2 of the code addresses lameness, as well as contributing factors to lameness (e.g. driving pressure exerted on herd when moving animals; design, construction and condition of races; handling in the yard; and excessive backing gate pressure). The NAWAC report contained "Golden Rules" where lameness is an issue.[523] Although these were incorporated into the recommended best practice section of Part 7.2, no minimum standards are provided. This is problematic given that lameness is clearly contrary to a cow's physical and health needs. As Knight noted:[524]

> Lameness has been described as the 'most important animal welfare problem for the dairy cow' (FAWC, *Report on the Welfare*). It is increased by wet or unhygienic conditions, or when cattle must walk long distances, along poorly maintained tracks. Cases last 4-6 weeks on average (Tranter and Morris) and can cause severe pain. Hoof sensitivity increases, and stimuli that are not normally painful, may become so.

In the opinion of Shane Kelly of Ngāi Tahu Farming, lameness is linked to driving pressure exerted on the herd within the cow yards. He considered this as primarily a management issue and considers that adequate training is important in responding to lameness. This means "ensuring [staff] understand how that damage occurs, identifying what that lameness is caused by… ensuring people identify the issues early and then act early."[525] The provision of adequate training to staff in relation to identifying and acting on lameness could in this way be included as a minimum standard in this section of the code, rather than as a recommended best practice only.[526]

Kerry Gray of Federated Farmers stated that where a cow becomes lame "you're putting her in a paddock quite close to the shed so she doesn't have to walk."[527] Jenny Jago of DairyNZ advised us that this

519 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 15(d)

520 Veterinary Council of New Zealand "Operational Guidelines: Induction of Calving", 01 June 2010, at <http://www.vetcouncil.org.nz/documentation/Other/OperationalGuidelines_InductionOfCalving.pdf>

521 New Zealand Veterinary Association "Induction of parturition of cattle" <https://www.nzva.org.nz/page/policyinducpart>

522 National Animal Welfare Advisory Committee, "Assessments for the layer hen code of welfare, pig code of welfare, dairy cattle code of welfare and the meat chicken code of welfare" whereby MPI undertook a process to identify what matters would be appropriate to be considered for regulations, specifically whether there were existing activities that were disallowed or transitional requirements within codes of welfare (February 2015) at 25 (Obtained under Official Information Act 1982 Request to MPI).

523 These include that dairy cattle should be managed so as to minimise the incidence of lameness; that they should be moved at a pace and with enough space such that they can keep their heads down and see where to place their feet; that all staff should be trained in the prevention, identification and treatment of lameness and more.

524 Knight, above n 516

525 Interview with Shane Kelly, above n 37

526 Code of Welfare (Dairy Cattle) 2019, Section 7.2, Recommended Best Practice (f) states that "All staff should be trained in the prevention, identification and treatment of lameness."

527 Interview with Kerry Gray, above n 36

practice is also used by dairy farmers affiliated with DairyNZ.[528] This common management technique enables cows to recover from lameness by giving them space from other cows and reducing the amount of walking they are required to do. This approach could be included as a minimum standard. At present this approach is not referenced in the code whatsoever.

The code also does not recognise that spending too much time off-paddock on a hard surface during pregnancy and early lactation can lead to lameness. This was identified as an issue by Kerry Gray of Federated Farmers.[529]

Knight notes that the identification and treatment of lameness on New Zealand farms may also be inadequate:[530]

> Large-scale, prospective studies assessing lameness prevalence in New Zealand are scarce; however, Fabian et al. locomotion scored 23,949 cows on 59 farms, using the DairyCo mobility scoring system to estimate lameness prevalence. The mean lameness prevalence was 8.3% (median, 6.7%; range, 1.2%– 36%). In contrast, mean lameness prevalence as estimated by farmers was 2.3% (median, 1.4%; range, 0–20%). Hence, only 27.3% (range 0–95%) of cows with reduced mobility were identified as such by New Zealand farmers – a detection rate broadly similar to that of farmers in the US (Espejo et al.) and UK (Leach et al.). Hence, identification and treatment in the case of this very important welfare problem presently appears inadequate.

4.14 OTHER HEALTH ISSUES

There are a number of significant health issues associated with dairy cattle that are not substantively addressed in the code of welfare, including metabolic diseases, mastitis (udder inflammation), Johne's disease and broken shoulders. Unfortunately, these have also not been addressed in the recent Animal Welfare (Care and Procedures) Amendment Regulations 2020, which otherwise address a range of surgical procedures in relation to animals.

4.14.1 METABOLIC DISEASE, MASTITIS AND JOHNE'S DISEASE

Metabolic diseases may occur when a dairy cow "cannot successfully adapt to all the physiological changes" that take place when it transitions from pregnancy to lactation, leading to a nutrient deficit in the cow.[531] A member of NAWAC stated at a NAWAC meeting in 2017 that they had discussions with vets about a recent increase in metabolic disease. This issue was potentially related to low calcium and could also have been linked to selective breeding and "pushing the animal genetically, as well as soil runoff and nutrient issues."[532]

528 Interview with Jenny Jago, above n 3. *Jago stated that where an animal is showing signs of lameness the animal will be "… drafted off from the herd and checked and then treated if necessary and they are generally held in a paddock that is close to the farm area, so that reduces any walking they have to do – and typically there'll be one or two other animals with them. And then once they've recovered they'll go back in the main herd."*

529 Interview with Kerry Gray, above n 36

530 Knight, above n 516

531 Dairy NZ "Understanding the transition cow" <https://www.dairynz.co.nz/feed/nutrition/transition-cows/understanding-the-transition-cow/>

532 National Animal Welfare Advisory Committee Minute "General Meeting" (17 May 2017) at [C 11]

Mastitis is another significant health issue. This involves a "potentially fatal mammary gland infection,"[533] and is painful for dairy cattle. It is "the most common disease in New Zealand dairy cattle and the most costly disease in the dairy industry."[534] Both mastitis and metabolic disease were identified as regularly recurring issues by Shane Kelly of Ngāi Tahu Farming.[535] An extensive 2007 New Zealand-wide study found that the average rate of mastitis in New Zealand is 12.7%.[536]

Kelly also advised "that the dairy industry has a real issue with Johne's [disease] – that flies under the radar and I think as an industry we need to start dealing with it."[537] Johne's disease is a chronic gut infection that can lead to lower milk production, difficulty reproducing, rapid weight loss, diarrhoea and death.[538] While Kelly acknowledged that Johne's disease has a long history in New Zealand, he stated:[539]

> …the prevalence within the normal herds is growing…[at a] huge cost to production…I think as an industry, there's a huge amount of wastage that's probably starting to come through – so that's a national issue.

4.14.2 BROKEN SHOULDERS

NAWAC identified in 2017 that there is an issue with broken shoulders in dairy cattle wherein "anecdotally, at times, 10% of a group can be affected. It was suggested that NAWAC pushes industry to investigate further."[540] This remains an issue, with NAWAC's Work Programme identifying "fractures in dairy cattle" as an animal welfare issue under management.[541] Dr Brent Neal (BVSc MANZCVS Veterinary Pharmacology) describes this as a "catastrophic injury for the animal involved [requiring] immediate euthanasia on welfare grounds."[542] Further research is being conducted on this issue with PhD student Michaela Gibson identifying that the fractures "affect at least 4% of dairy farms and approximately 5000 heifers are thought to be lost to the condition."[543] She identifies two types of fractures. The first is likely a result of the use of fodder beet as a winter crop in the South Island and consequent deficiency in phosphorous leading to poorly mineralised bones. The second relates to bones with osteoporosis, which may be linked to "intermittent periods of inadequate/unbalanced nutrition."[544] The disease has also been linked to low copper levels and veterinarians have recommended "conducting a few routine liver biopsies on young stock to assess the liver copper levels and set up an appropriate supplementation program."[545]

533 AgriHealth "Mastitis" <https://agrihealth.co.nz/products/mastitis>
534 AgriHealth
535 Issues identified in interview with Shane Kelly, above n 37
536 S McDougall, D G Arthur, M A Bryan, J J Vermunt and A M Weir "Clinical and Bacteriological Response to Treatment of Clinical Mastitis With One of Three Intramammary Antibiotics." 55 N Z Vet J 161.
537 Interview with Shane Kelly, above n 37
538 LIC "Johne's disease whole herd testing" <https://www.lic.co.nz/products-and-services/animal-health-and-dna-testing/johnes-disease-whole-herd-testing/>
539 Interview with Shane Kelly, above n 37
540 National Animal Welfare Advisory Committee, above n 533, at [C 11]
541 National Animal Welfare Advisory Committee *NAWAC Work Programme* (Ministry for Primary Industries, 16 November 2006)
542 Franklin Vets "Fractured shoulders in first calvers" (14 June 2019) <https://franklinvets.co.nz/2019/01/14/fractured-shoulders-in-first-calvers/>
543 The AgriSciencer "Can measures of the cannon bone in cows predict the structure of the shoulder bone?" (31 July 2019) <https://www.agrisciencer.com/post/bone-measures-and-humeral-fractures-in-dairy-heifers>
544 The AgriSciencer
545 Franklin Vets, above n 543

4.15 ELECTIVE HUSBANDRY PROCEDURES

4.15.1 CASTRATION

Regulation 53 of the Animal Welfare (Care and Procedures) Regulations 2018 allows for dairy cattle under the age of 6 months old to be castrated without using local anaesthetic. This is potentially problematic due to the pain that this procedure can cause.

Webster *et al*. examined the use of local anaesthesia on two- to three-month-old calves when castrated. The authors found that the use of certain anaesthetics reduced or eliminated the duration of cortisol response to castration; reduced crouching and postural shifts after surgical castration; and led to more feeding behaviour after castration.[546] A number of other studies have similarly found that anaesthesia does assist in reducing pain and stress when administered to calves prior to castration,[547] with Ballou *et al*. stating that calves should be administered with pain relief prior to performing this procedure.[548]

546 H.B. Webster, D. Morin, V. Jarrell, C. Shipley, L. Brown, A. Green, R. Wallace, P.D. Constable "Effects of local anesthesia and flunixin meglumine on the acute cortisol response, behavior, and performance of young dairy calves undergoing surgical" (2013) 96 J. Dairy Sci. 6285. castration

547 Stafford et al, above n 547; and J.F. Coetzee, R. Gehring, J. Tarus-Sang, D.E. Anderson "Effect of sub-anesthetic xylazine and ketamine ('ketamine stun') administered to calves immediately prior to castration" (2010) 37 Vet Anaesth Analg 566 and G. Stilwell, M.S. Lima, D.M. Broom "Effects of nonsteroidal anti-inflammatory drugs on long-term pain in calves castrated by use of an external clamping technique following epidural anesthesia" 69 Am. J. Vet. Res. 744; and M.A. Ballou, M.A. Sutherland, T.A. Brooks, L.E. Hulbert, B.L. Davis, C.J. Cobb "Administration of anesthetic and analgesic prevent the suppression of many leukocyte responses following surgical castration and physical dehorning" (2013) 151 Vet Immunol Immunop 285; and D. Van der Saag, P. White, L. Ingram, J. Manning, P. Windsor, P. Thomson and S. Lomax "Effects of Topical Anaesthetic and Buccal Meloxicam Treatments on Concurrent Castration and Dehorning of Beef Calves" (2018) 8 Animals 35.

548 Ballou et al, above n 548

4.15.2 EAR TAGGING, FREEZE BRANDING AND HOT BRANDING

The code of welfare permits the use of freeze branding (the use of liquid nitrogen and alcohol to cool a branding iron such that can be used to alter the hair follicle of dairy cattle for branding purposes) and ear tagging. The code includes as a recommended best practice that "care should be taken when applying an ear tag to avoid hitting the cartilage ridges or major blood vessels"[549] and that "Any infection resulting from tag application should be treated promptly."[550] Similarly, it is a recommended best practice that where "freeze branding is used, it should be applied by a competent operator"[551] (this recommendation will become mandatory from 9 May 2021 as a result of the Animal Welfare (Care and Procedures) Amendment Regulations 2020).[552]

However, farmers are not required to give dairy cattle analgesics or anaesthetics during these procedures, despite the fact that ear tagging and freeze branding are likely painful.[553] NAWAC did not discuss the science behind including ear tagging and freeze branding in the code of welfare without requiring pain relief or anaesthetic. Thus, these provisions are in need of review.

The code currently permits the use of hot branding, although it specifies that this cannot be used without pain relief.[554] However, the code does not specify what this pain relief should consist of (e.g. whether farmers should use analgesics (to block pain), or local/general anaesthetic (to block all sensation). This is problematic given that it is well recognised hot branding is painful for cattle.[555] Previously, NAWAC has recognised that hot branding may need to be addressed through the regulations route,[556] and this is set to take place from 9 May 2021 when hot branding of all animals except for horses, ponies and donkeys will be prohibited.[557]

549 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 13 (Identification), Recommended Best Practice (b)

550 Minimum Standard No. 13 (Identification), Recommended Best Practice (c)

551 Minimum Standard No. 13 (Identification), Recommended Best Practice (d)

552 Regulation 55K of the Animal Welfare (Care and Procedures) Amendment Regulations 2020 provides that a person who freeze brands a cattle beast or an equid must be experienced with, or have received training in, the correct use of the method; be able to recognise early signs of significant distress, injury, or ill-health so that they can take prompt remedial action or seek advice; that the owner and every person in charge of the animal must ensure the health and welfare needs of the animal are met during the procedure and recovery by ensuring that at all times a person is available who has suitable equipment and has the relevant knowledge, has received relevant training or is under appropriate supervision. Similarly, the Code of Welfare (Dairy Cattle) 2019 will be revised with a new Minimum Standard No. 13(a) stating that "Freeze branding must be done by a person experienced with, or who has received training in, the correct use of the method used and who is able to recognise early signs of significant distress, injury, or ill-health so that the person can take prompt remedial action or seek advice."

553 Kevin Stafford *Animal Welfare in New Zealand*, above n 470, at 2

554 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No. 13 (Identification)

555 C. B. Tucker, E. M. Mintline, J. Banuelos, K. A. Walker, B. Hoar, A. Varga, D. Drake, D. M. Weary, "Pain Sensitivity and healing of hot-iron cattle brands" (2014) 92 Journal of Animal Science 5674 at 5674.

556 National Animal Welfare Advisory Committee Minute "General Meeting" (11 March 2015) at [C 4], noting that it is "currently allowed in codes, but there are alternatives, it could be considered outdated, and perhaps should be banned."

557 Animal Welfare (Care and Procedures) Amendment Regulations 2020, regulation 55L. Regulation 55M outlines the exception to this, being horses, ponies and donkeys. The Code of Welfare (Dairy Cattle) 2019 will be amended accordingly, with a new Minimum Standard No. 13(b) stating "Hot branding must not be used."

4.16 SELECTIVE BREEDING

The code of welfare does not specifically address the issue of selectively breeding dairy cattle in order to maximise milk yield and the health impacts of this.

Oltenacu and Broom noted that an increase in production leads to concerns regarding fertility; increased leg and metabolic problems; and declining longevity.[558] Ingvartsen *et al*. found an association between increased milk yield and an increased incidence of lameness, mastitis, ovarian cysts and ketosis.[559] Knight recently stated:[560]

> Genetic selection for increased productivity has resulted in the diversion of a greater proportion of biological resources into milk and muscle production, in dairy and beef cattle respectively. This means that fewer are available for maintenance (which results in many dairy cows being chronically hungry), or for immune function, to support tissue repair, or to respond to stressful stimuli. Unsurprisingly, therefore, rates of some diseases appear to be increasing, including reproductive problems (such as failure to conceive), mastitis (udder inflammation), lameness and metritis (uterine inflammation) (Von Keyserlingk et al.).

In addition, the highly productive nature of dairy cattle may lead to their being unable to consume sufficient calories to replace what they use, particularly during the last trimester of pregnancy and during lactation after birth. This can result in "a negative daily energy balance, chronic hunger, and a weakened immune system." As Knight noted:[561]

> Cows lose body condition during late gestation and for six to 10 weeks after calving (Roche, Berry and Kolver). On a typical, well managed New Zealand dairy farm, Roche, Macdonald et al. assessed 23% of cows as being thin. Such cows are at significant risk of metabolic and infectious diseases (Ingvartsen et al.; Goff), which can result in serious welfare problems.

In its 2017 report on selective breeding, NAWAC raised a number of other concerns. The committee encouraged selecting for polledness (the state of being born hornless) in order to avoid having to disbud and dehorn dairy cattle (and the pain associated with these procedures), noting that this is not currently a priority in the industry due to "compromises in genetic gain elsewhere."[562] Other issues included genetically selecting cows for higher longevity within the context of indoor systems and higher production; ensuring that animal genotype is appropriate for its environment; that care should be taken in using easy to calve bulls born to dairy cattle; and the potential danger of extensively using a popular sire.[563] None of these issues are addressed in the Code of Welfare (Dairy Cattle) 2019 or in the regulations.

558 PA Oltenacu and DM Broom "The impact of genetic selection for increased milk yield on the welfare of dairy cows" (2010) 19 Anim. Welfare 39 at 39

559 KL Ingvartsen, RJ Dewhurst, NC Friggens "On the relationship between lactational performance and health: is it yield or metabolic imbalance that causes diseases in dairy cattle? A position paper" (2003) 83(2) Livest Prod Sci 277 at 281

560 Knight, above n 516

561 Knight

562 National Animal Welfare Advisory Committee, above n 121, at 8

563 At 8

4.17 BOBBY CALVES

Bobby calves are newborn calves up to 14 days old that are separated from their mother.[564] Approximately 20-25% of these calves are raised to replace dairy cattle; 20-30% are kept for beef raising; and a small number are kept as dairy bulls. Calves not kept for these reasons are slaughtered for meat for human consumption or for pet food soon after being separated from their mothers.[565]

The treatment and slaughter of bobby calves in New Zealand has gained significant media attention in recent years. In particular, footage emerged in 2015 and 2016 showing bobby calves expressing distress at being separated from their mothers; left in the heat for long durations; roughly thrown into trucks; and thrown, kicked, dragged along the ground and bludgeoned to death at a slaughterhouse.[566] These images shocked the public and led to the enactment of a number of regulations to address welfare issues associated with the treatment of these calves on New Zealand farms. These regulations prohibit the killing of calves by blunt force to the head; provide for a maximum time young calves may be off feed before slaughter; provide for shelter requirements for young calves before transportation and at points of sale and slaughter; require farmers to ensure that young calves are fit for transport; provide for a maximum duration of transport for young calves; provide for requirements for loading and unloading facilities used with young calves; provide for shelter requirements for young calves during transportation; and prohibit the transportation of young calves by sea across Cook Strait.[567]

However, there are still welfare issues associated with the treatment of bobby calves in New Zealand. First, bobby calves are essentially a 'waste product' of the dairy industry - 18.8 million such calves were slaughtered in the year ending September 2019.[568] As NAWAC noted in its 2017 report on selective breeding, such slaughter may be reduced or minimised through using new breeding technologies to ensure that calves born are female and can thus be reared as dairy cattle.[569] Bobby calves are also separated from their dams soon after birth, leading to distress for both mother and calf (as discussed previously in this chapter at section 4.7.4). And a 2016 study of 12 meat processing plants in New Zealand found that:[570]

> A number of health or physiological indicators were found to be prevalent among calves assessed at the individual level. Those with prevalence of 20% or more included: dehydration, faecal soiling, nasal and ocular discharge and increased or decreased respiratory rate.

564 Ministry for Primary Industries "Guide to the Animal Welfare (Care and Procedures) Regulations" www.mpi.govt.nz/protection-and-response/animal-welfare/guide-to-the-animal-welfare-care-and-procedures-regulations/
565 Ministry for Primary Industries *Mortality rates in bobby calves 2008 to 2016* (MPI Information Paper No: 2017/01, February 2017) at 8
566 SAFE, above n 479
567 Animal Welfare (Care and Procedures) Regulations 2018, regulations 8, 9, 10, 33, 34, 35, 36, and 37 respectively
568 Ministry for Primary Industries *Situation and Outlook for Primary Industries* (December 2019)
569 National Animal Welfare Advisory Committee, above n 121, at 8
570 Boulton et al, above n 323, at 111

“THE COURT FOUND THAT…THE STANDARDS RELATING TO FARROWING CRATES…‘CIRCUMVENTED PARLIAMENT’S INTENTION IN ENACTING THE 2015 AMENDMENT’ AND WERE ‘CONTRARY TO THE PURPOSES OF THE ACT’.”

EXTRACT FROM PAGE 118

CHAPTER 5 - CODE OF WELFARE (PIGS) 2018

5.1 OVERVIEW

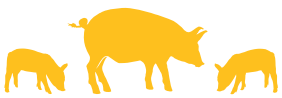
The Code of Welfare (Pigs) 2018 applies to all pigs, including breeder pigs. Approximately 55% of pigs in New Zealand are farmed indoors in a variety of housing systems such as pens or crates, with the remaining 45% farmed outdoors.[571] The majority of pigs farmed outdoors are free farmed, with the breeding herd based outdoors and growing pigs housed indoors on bedding.[572] Only 2% of pigs are free-range, meaning that they live outdoors for their whole life and are provided with shelter and protection from the elements (such as an individual hut for sows when farrowing and giving birth).[573]

We analysed the Code of Welfare (Pigs) 2018 through conducting a peer review of the research that would have been available to NAWAC when it first reviewed the code in 2010; by reviewing the literature that has subsequently become available since 2010; by reviewing literature relevant to the 2018 amendments to the code; and by reviewing NAWAC's report on the Code of Welfare (Pigs) 2010.[574] We also considered the regulations relevant to pigs.

This analysis has exposed numerous animal welfare concerns. These include:

- **Use of Farrowing Crates**: The use of farrowing crates is urgently in need of address. Farrowing crates allow for the intensive confinement of sows while farrowing, which greatly frustrates the ability of the sow to express its normal behaviours and also impacts on its physical and health needs. It has now been acknowledged by NAWAC that the use of farrowing crates for up to four weeks – five weeks is unnecessary.[575] Farrowing crates do not meet the obligations under the Act to provide for the physical, health and behavioural needs of pigs. This has recently been recognised by the High Court in judicial review proceedings brought by the NZALA and SAFE, where the Court declared the provisions relating to farrowing crates in the code of welfare and regulations unlawful and invalid.[576]
- **Provision of Adequate Nest-Building Material While Farrowing:** The code and regulations do not adequately ensure that nesting material be provided to sows while farrowing. This is problematic, given that sows are highly motivated to use such materials, with nesting being a deeply ingrained behaviour in sows. In particular, the extent and type of material should be specified to provide clarity to farmers, and nesting material should be required to be provided to sows in farrowing systems constructed prior to 3 December 2010 (this is not currently the case).[577]
- **Use of Sow Stalls**: The use of sow stalls for mating is problematic. As with farrowing crates, sows are tightly confined in this environment and cannot express their behavioural needs. NAWAC has previously stated the use of sow stalls should be eliminated. As with farrowing crates, the High Court has recently found the provisions permitting the continued use of sow stalls are unlawful and invalid.[578]
- **Space**: Space in general is an issue for pigs. The code of welfare and regulations do not provide sufficient space to account for pigs' movement and so as to ensure that their behavioural needs are met (including play, foraging and exploration). The intensive farming of pigs also leads to heightened aggression; increased skin lesions; increased incidence of negative social behaviour; higher stress

571 New Zealand Pork "Farming Styles" <https://www.nzpork.co.nz/farming-pigs/farming-styles/>
572 New Zealand Pork
573 New Zealand Pork
574 National Animal Welfare Advisory Committee, above n 130
575 National Animal Welfare Advisory Committee, above n 199, at 2
576 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [201]
577 Code of Welfare (Pigs) 2018, Minimum Standard No. 10(h)
578 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [201]



levels; and more. NAWAC has recognised that pigs require more space and numerous scientific studies have confirmed this. The code of welfare and regulations need to be amended accordingly, such that more generous space allowances for pigs are made mandatory.

- **Lack of Clarity Regarding Shelter for Pigs With Access to the Outdoors:** Where pigs are housed outside adequate space should be provided in the shelter that is provided to them and there should be clarity in the code and/or regulations regarding stocking densities for pigs kept outdoors – this is not currently the case, with such requirements having been made the subject of local Government regulations that are difficult to find.
- **Providing for the Behavioural Needs of Pigs:** The code of welfare and regulations fail to sufficiently provide for the behavioural needs of pigs, including in relation to play, foraging, rooting, exploration and wallowing. Pigs have a wide range of behavioural needs and these are not currently protected under the code of welfare and regulations, with the code only ensuring that pigs are able to exhibit a limited range of behaviours, including feeding, drinking, sleeping, dunging and urination, vocalisation, thermoregulation and social contact.[579]
- **Premature Weaning of Piglets:** Pigs are weaned very early in commercial production, with a consequent impact on their physical health and behaviour. This may need to change to ensure the needs of pigs are met.
- **Use of Elective Husbandry Procedures**: There are numerous elective husbandry procedures, which impact on the welfare of pigs. These include tail docking; the clipping and grinding of pigs' teeth; the use of nose rings and clips; identification procedures that involve notching, tagging, punching or tattooing pigs' ears or bodies; tusk trimming of boars; and castration of piglets over the age of two – seven days old. A number of these procedures (including tail docking and clipping/grinding of teeth) are only necessary due to the intensive conditions in which pigs are kept and may be ameliorated through the provision of environmental enrichment. Additionally, all of these procedures may cause pigs pain and a number do not require pain relief to be provided (e.g. use of nose rings and clips, identification procedures, clipping/grinding of teeth where pigs are under five days of age).
- **Use of Electric Prodders and Goads**: Regulation 48 of the Animal Welfare (Care and Procedures) Regulations 2018 allows for the use of electric prodders on pigs, which causes pigs stress and pain. While the regulation only allows for the use of such prodders where pigs are over 70kg – 150kg in certain circumstances, they do not ensure that such prodders are only used for one second at a time; that multiple applications should be adequately spaced; or that shocks should be discontinued if the animal fails to respond. It is also not a requirement of regulation 49 that goads not be used on the ears and nose of pigs, despite these areas being sensitive.
- **Ventilation:** High levels of ammonia are permitted in indoor systems, which may be harmful to pigs. It is not a requirement of the code or regulations that these levels be measured and monitored by farmers.
- **Lighting**: The code of welfare currently allows pigs to be kept in total darkness for 15 hours a day, with a low artificial light of only 20 lux being required for the other 9 hours of the day. This may lead to higher levels of aggression due to a consequent inability of pigs to discriminate between familiar and unfamiliar pigs.
- **Mixing of Pigs:** The code and regulations provide insufficient provision for the mixing of pigs, which can lead to stress and aggression if not adequately managed. There are no minimum standards in relation to this welfare issue and this should be addressed.

579 Code of Welfare (Pigs) 2018, Minimum Standard No. 9

- **Genetic Selection of Pigs for Their Environment:** Genetic selection in relation to pigs should be more thoroughly addressed in the code of welfare and/or regulations. In particular, the delegated legislation needs to account for the physical, health and behavioural impact of genetically selecting pigs for high productivity. Such impacts include clumsier, heavier sows that are more likely to lie on top of their piglets and leg weakness. Alternatively, genetic selection could be used as a means of reducing the need for farrowing crates through breeding for non-crushing sows with a greater maternal instinct and genetically selecting for more robust piglets.

NAWAC has stated that the code of welfare for pigs will be reviewed in the next 1-3 years or the next 3-5 years, with this timeframe being dependent upon the prior completion of the NZALA and SAFE's judicial review proceedings in respect of farrowing crates and sow stalls, and the Primary Production Selection Committee's processes around these welfare issues.[580] As stated, the judicial review proceedings determined that sow stalls and farrowing crates are invalid and unlawful. This finding will impact on the content of the code of welfare for pigs and NAWAC's review.

5.2 FARROWING CRATES: OVERVIEW AND RECENT HIGH COURT DECISION

A farrowing crate is a "crate in which sows are confined individually before, during and after 'farrowing', which is giving birth."[581]

Minimum standard 10(c) provides that when in a farrowing crate, a sow must be able to avoid all of the following: touching both sides of the crate simultaneously; touching the front and the back of the crate simultaneously; and touching the top of the crate when standing.[582] This is reiterated in regulation 26 of the Animal Welfare (Care and Procedures) Regulations 2018. These requirements equate to a crate that is approximately 2.1m x 0.9m,[583] in which pigs cannot step backwards or forwards and cannot turn around.[584]

Minimum standard 10(e) – (g) provides that farrowing crates are permitted prior to farrowing for no more than five days;[585] if sows are to be confined in farrowing crates for lactation, they must be confined for no more than four weeks after farrowing;[586] and a further 5% of sows may be confined for an additional week for cross-fostering purposes.[587] Thus, sows can be kept in a farrowing crate for up to 5-6 weeks.

The continued use of farrowing crates is problematic. First, their use is widespread in New Zealand with about 60% of sows (approximately 14,580 sows)[588] being kept in farrowing crates for approximately

580 National Animal Welfare Advisory Committee, above n 324, at 1. This judicial review was brought by NZALA and SAFE.
581 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [2]
582 Code of Welfare (Pigs) 2018, Minimum Standard No 10(c). This requirement is made enforceable through Regulation 26 of the Animal Welfare (Care and Procedures) Regulations 2018.
583 Andrew Knight "Uncaging New Zealand's Sows: Scrutinising Farrowing Crates" (SAFE, 6 June 2018) at 9.
584 SAFE "Justice for all animals" < https://safe.org.nz/campaigns/justice-for-animals>
585 Code of Welfare (Pigs) 2018, Minimum Standard No. 10(e)
586 Minimum Standard No. 10(f)
587 Minimum Standard No. 10(g)
588 Knight, above n 584, at 32. This 60% figure is also cited in Kirsty L. Chidgey, Patrick C.H. Morel, Kevin J. Stafford and Ian W. Barugh "Sow and piglet productivity and sow reproductive performance in farrowing pens with temporary crating or farrowing crates on a commercial New Zealand farm" (2015) 173 Livest. Sci. 87 at 87.

12.5 weeks per year.[589] Secondly, the use of these crates does not meet the standard outlined in the Act of providing for the 'physical, health and behavioural needs' of pigs.[590] In particular, the severe spatial restrictions placed on pigs in these circumstances means that their ability to express their normal behaviours is extremely circumscribed.

The use of farrowing crates was originally permissible by virtue of the "exceptional circumstances" exemption in the former s 73(3) of the Act (now repealed). This section provided that NAWAC could, in exceptional circumstances, recommend minimum standards that did *not* ensure the physical, health and behavioural needs of animals. NAWAC could have regard to the feasibility and practicality of effecting a transition to a new practice and the economic effects of such a transition in affecting a provision under s 73(3).[591]

Despite the fact that s 73(3) was repealed as a result of the Amendment Act 2015,[592] in 2018 the Minister of Agriculture (on the recommendation of NAWAC) utilised s 183A(1) of the Act to introduce regulation 26 and to make amendments to minimum standard 10 in the new 2018 code of welfare. This decision in effect permitted the use of farrowing crates indefinitely, when in fact they should have been phased out under the timeline provided at s 183A(5) (being 10 – 15 years), as they do not fully meet the obligation under s 10 of the Act to ensure that the physical, health and behavioural needs of animals are met in accordance with both good practice and scientific knowledge.[593]

5.2.1 RECENT HIGH COURT DECISION IN THE NEW ZEALAND ANIMAL LAW ASSOCIATION V THE ATTORNEY GENERAL [2020] NZHC 3009

The High Court has recently made a ruling in respect of the provisions relating to farrowing crates and sow stalls in judicial review proceedings brought by the NZALA and SAFE (their findings in relation to sow stalls are discuss in section [5.3]). The Court deemed the relevant provisions "unlawful and invalid."[594]

The Court noted that farrowing crates were "singled out in the parliamentary debates on the [2015] Amendment Bill as an example of an ongoing, non-compliant practice that was to be phased out".[595] Similarly, the Court noted that NAWAC had "consistently viewed the use of farrowing crates as contrary to the welfare obligations under the Act."[596] For example:

- The continued use of farrowing crates was permitted in the Code of Welfare (Pigs) 2005 and Code of Welfare (Pigs) 2010 only under the "exceptional circumstances" exemption in the now repealed s 73(3) of the Act. As the High Court noted, this "was an acknowledgment that the minimum standards

589 Hans Kriek of SAFE provided an estimate of 12.5 weeks, being "five weeks confinement per cycle, times 2.5 cycles is 12.5 weeks confinement in total" Email to the author from Hans Kriek (SAFE Ambassador) in response to the question our website states in relation to farrowing crates that "… more than 14,000 mother pigs are confined" and that "Mother pigs are confined for over three months each year" (SAFE, above n 585). Where are these figures from?" (18 November 2019).This is on par with other estimates of how many litters pigs mayhave annually. Total Vets (https://www.totallyvets.co.nz/portfolio,portfolio,,274,Reproduction+in+pigs.html), for example, say "*Sows can produce over two litters per year…*" See also Food and Agriculture Organization of the United Nations "A Manual for the Primary Animal Health Care Worker: Working Guide, Guidelines for Training, Guidelines for Adaptation" (Food & Agriculture Org., 1994) http://www.fao.org/3/t0690e/t0690e06.htm at unit 31:
A well fed sow will produce at least 10 piglets (litter) from each pregnancy and may have 2 litters each year

590 Animal Welfare Act 1999, s 9

591 In so doing, NAWAC was able to have regard to: "the feasibility and practicality of effecting a transition from current practices and any adverse effects that may result from such a transition, and the economic effects of any transition from current practices to new practices" Code of Welfare (Pigs) 2018 at 18. These considersations were outlined in the former s 73(4) (now repealed).

592 Under the Amendment Act 2015

593 Animal Welfare Act 1999, s 183A(2)

594 High Court (press release), above n 5, at [197]

595 At [12]

596 At [12]

did not fully meet the Act's requirements to ensure that all animals' physical, health and behavioural needs were met."[597]

- NAWAC noted in the Code of Welfare (Pigs) 2005 that it would "like to see farrowing crate use 'phased out altogether' after further review."[598]
- NAWAC stated in the Code of Welfare (Pigs) 2010 - "confining sows in farrowing crates for extended periods does not fully meet the obligations of the Act, but there are currently no alternatives that meet both animal welfare and commercial outcomes."[599]
- In a letter to the Minister of Agriculture dated 20 October 2010, NAWAC wrote that it "re-affirms the view it stated in the 2005 Code that the use of farrowing crates should be phased out eventually… NAWAC does consider that the confining of sows in farrowing crates for extended periods does not fully meet the obligations of the Act…"[600]
- On 26 March 2014, MPI wrote to the chairperson of the Primary Production Committee advising, "NAWAC has determined that the use of farrowing crates by the pork industry does not meet the requirements of the Act."[601]

Despite NAWAC having recognised on numerous occasions that farrowing crates do not meet the obligations under the Act, in 2016 it reported to the Minister that minimum standard 10 *was* the minimum necessary to ensure that the purposes of the Act were met.[602] This advice was provided on the basis that farrowing crates provide "the best welfare outcome for the welfare needs of piglets and the best total welfare of piglets and sows, based on currently available farrowing practices and scientific knowledge."[603] Thus, NAWAC advised that minimum standard 10 in the Code of Welfare (Pigs) 2010 was the "minimum necessary to ensure that the purposes of the Act were met."[604]

NAWAC's change of position was at the core of the NZALA's challenge to the farrowing crate provisions, which aimed to demonstrate that NAWAC changed its position only after the "exceptional circumstances" exemption for non-compliant practices under s 73(3) was repealed in 2015.

The Court agreed with this viewpoint. It noted NAWAC's subsequent statements as regards farrowing creates since the Amendment Act 2015:

- In the Code of Welfare (Pigs) 2018: "As stated in the 2005 code of welfare, NAWAC wants to see indoor housing systems shift progressively to those in which the lactating sow and piglets have the benefits conferred by farrowing crates while giving the sow increased opportunity to move and express a greater range of behaviours, including nest building. NAWAC strongly encourages the industry to identify and adopt such systems as soon as possible."[605]

597 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [100]
598 At [96]
599 At [97]
600 At [99]
601 At [101]
602 At [104]
603 At [104]
604 At [104]
605 Code of Welfare (Pigs) 2018 at 17

- In a submission to the Primary Production Committee in 2018, NAWAC said it "considered the current approach, in which farrowing crates are used for up to four weeks post-farrowing, *do not meet the animal welfare obligations* in that sows have their activity restricted for a longer period than is necessary… Previous trade-offs of long term sow freedom against piglet survival can no longer be used as current perceptions are that the requirements of each individual in the system should be provided for if possible."[606]

The Court found that both regulation 26 and minimum standards 10(c), (e) – (g)[607] (being the standards relating to farrowing crates and the timeframes within which they may be used) "circumvented Parliament's intention in enacting the 2015 Amendment"[608] and were "contrary to the purposes of the Act".[609] This was on the basis that the provisions do not meet the minimum requirement of the Act to provide for the physical, health and behavioural needs of animals, as had been recognised:

- By NAWAC on numerous occasions, as outlined above;
- By Parliament in its commentary to the 2015 Amendment Bill, where it stated "The exceptional circumstances provisions currently enable NAWAC to recommend minimum standards and codes of welfare that do not fully meet the obligations in the Act. These provisions have been used, for example, to permit the use of battery cages until a certain date is reached and *to permit the ongoing use of farrowing crates for pigs with no final date."*[610]

Subsequent to NAWAC's 2016 advice to the Minister, MPI (in consultation with NAWAC) prepared a Cabinet paper on the animal welfare regulations for the Minister[611] in which it recommended that regulations 26 and 27 (pertaining to farrowing crates and sow stalls) be made under s 183A(1) of the Act, which permits the making of regulations "prescribing standards or requirements for the purposes of giving effect to" the Act. This approach was incorrect. The Court stated that s 183A(2) was the appropriate route through which to implement these provisions, as this section permits the making of a regulation that does *not* fully comply with the Act subject to the phasing out timeframe of 10-15 years outlined at s 183A(5)(b) and s 183A(6).

The Court noted NAWAC's commentary to the Code of Welfare (Pigs) 2010, which referred to the lack of alternatives to farrowing crates "that meet both animal welfare and commercial outcomes."[612] It then referred to s 183A(3)(a), which specifically addresses the making of regulations under s 183A(2) where "any adverse effects of a change from current practices to new practices have been considered and there are no feasible or practical alternatives currently available." In the Court's view, this section made Parliament's intention clear that "where there are no viable alternatives to non-compliant practices, the practices must be phased out over a specified time."[613] In contrast, in making its recommendation under s 183A(1), NAWAC incorrectly "approved the practices of farrowing crates and mating stalls to continue indefinitely."[614]

606 *The New Zealand Animal Law Association v The Attorney General*, above n 4 at [111]

607 As outlined at [5.2], Minimum Standard No. 10(c) provides that "When in a farrowing crate, the sow must be able to avoid all of the following: touching both sides of the crate simultaneously, touching the front and the back of the crate simultaneously, and touching the top of the crate when standing"; Minimum Standard No. 10(e) provides "If sows are to be confined in farrowing crates before farrowing, it must be for no more than five days"; Minimum Standard No. 10(f) provides "If sows are to be confined in farrowing crates for lactation, it must be for no more than four weeks after farrowing"; and Minimum Standard No. 10(g) provides "Notwithstanding (f), nurse sows may be retained in a farrowing crate for a further week for fostering purposes. This is conditional on no more than 5% of sows in any herd at any one time being retained as nurse sows."

608 High Court (press release), above n 5, at [15] and [16]

609 At [15] and [16]

610 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [84]

611 Cabinet Paper "Animal Weflare Regulations for Submission to Cabinet" (5 March 2018 Sub 17-0064

612 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [97]

613 At [116]

614 At [116]

The Court directed the Minister to:[615]

a) consider recommending new regulations phasing out the use of farrowing crates and mating stalls under s 183A(2) of the Act; and

b) consider making such changes to minimum standards 10 and 11 in the 2018 Code accordingly.

The Court "declined to resolve the factual, scientific, and literature disputes among the experts"[616] as regards the use of farrowing crates and sow stalls. Rather, its analysis focussed on whether the subordinate legislation in question was contrary to the intention of Parliament, and whether it was permitted by the empowering statute (the Animal Welfare Act 1999). Cull J noted that the "courts have consistently expressed particular reluctance to become involved in scientific disputes where the court is not in a position to definitively adjudicate on scientific opinions."[617]

We consider the 'factual, scientific and literature' disputes as regards farrowing crates below at [5.2.2] – [5.2.5].

5.2.2 WELFARE IMPACT OF USING FARROWING CRATES

This confined nature of the farrowing crate is particularly problematic in pigs given that they are naturally inclined to exploratory behaviour, with such behaviour accounting for up to 75% of pigs' activities when kept in a semi-natural enclosure.[618]

The size of such crates does not account for nest-building behaviours, which are fundamental to farrowing sows. Baxter *et al*. stated: "sows normally circle when constructing [their] nest, and this may define the minimum space needed for the nest itself."[619]

Sows also have a natural inclination to seek isolation when farrowing, with sows walking between 2.5km – 6.5km from the group in order to build their nest.[620] Although individual open pens and crates give sows physical isolation, they do not provide them with auditory, visual or olfactory isolation. It has been hypothesised that this may lead to increased frustration and aggression (although this has not been substantively proven).[621]

Our previous research has indicated that these confined conditions lead to frustration and stress and behaviours such as "restlessness, aggression and pathological oral / nasal behaviours (stereotypies) such as bar-biting, chewing, licking and rubbing."[622] The psychological stress resulting from this also "interferes with the normal endocrine control of parturition,"[623] with behavioural restriction in particular leading to increased stress.[624]

615 High Court (press release), above n 5, at [20]
616 *The New Zealand Animal Law Association v The Attorney General*, above n 4, at [194]
617 At [192]
618 Stolba, A. and Wood-Gush, D.G.M. "The identification of behavioural key features and their incorporation into a housing design for pigs" (1984) 15 Annales de Recherche Ve´terinaire 287
619 E.M. Baxter, A.B. Lawrence, and S.A. Edwards "Alternative farrowing systems: design criteria for farrowing systems based on the biological needs of sows and piglets" (2011) 5 Animal 580 at 584.
620 Anna K. Johnson and Jeremy N. Marchant-Forde "Welfare of Pigs in the Farrowing Environment" in Jeremy N. Marchant-Forde (ed) *The Welfare of Pigs* (Springer, USA, 2009) 141 at 143.
621 At 157
622 Knight, above n 584, at 2. Knight outlines at 8 that stereotypies are "repetitive, apparently purposeless behaviours such as bar-biting, which are believed to indicate both profound and chronic (long-term) stress."
623 Richard B. D'Eath and Simon P. Turner "The Natural Behaviour of the Pig" in Jeremy N. Marchant-Forde (ed) *The Welfare of Pigs* (Springer, USA, 2009) 13 at 38.
624 Johnson and Marchant-Forde, above n 621 at 159

The intensive confinement of farrowing crates impacts the behaviour of piglets, for example in their natural inclination to play. This desire to play begins at two days of age and peaks at two-six weeks of age. It includes behaviours such as tossing and waving the head, spinning around, carrying and shaking objects, jumping and, when in groups, object play and chasing.[625] Similarly, "[investigation] of substrates… and rooting can be observed in day old piglets."[626] Such behaviours are not facilitated in a farrowing crate system, given the lack of space and enrichment in the environment. The frustration of these behaviours causes piglets to redirect their exploratory behaviour towards other piglets and their mother, with "sows in barren pens [having] more teat lesions, and a higher proportion of piglets [having] facial lesions… which are normally caused by fighting."[627] Conversely, it has been found that piglets born in pen-based systems interact more with neighbouring gilts/sows, and that gilts both born *and* raised in pens touch and vocalise towards their piglets more, with piglets born to such gilts spending "more time active in the creep area."[628] In this way, the "level of maternal care experienced by offspring in early life may influence their future behaviour",[629] with the level of maternal care expressed being heavily influenced by the farrowing environment.

Farrowing systems have a significant impact on the physical and health needs of sows and piglets. Our previous research has noted that farrowing systems make it impossible for pigs to make their own choices regarding thermal and physical comfort (such as moving away from draughts when cold, seeking comfortable spaces for lying down and seeking shade and wallowing in pools when hot), which can lead to potential heat or cold stress.[630] The spatial restriction of a farrowing crate and the hard surfaces (such as concrete) on which sows are often kept contributes to injuries such as skin lesions, pressure sores, joint injuries, lameness as well as reduced cardiovascular fitness and poor leg health, all of which are exacerbated by high sow body weight and poor fitness caused by the sow being unable to exercise.[631] The prevalence of decubital ulcers is another result of farrowing crate systems.[632] Baxter *et al*. noted that the impact on piglets can also be significant, with "longer farrowing times having been reported from farrowing systems with higher associated stillborn rates in some studies."[633] Baxter *et al*. found that piglets in farrowing systems experience a higher incidence of injury, either as a result of savaging by their mother; being crushed due to sow restlessness; or due to delays in the ability of piglets to achieve early suckling in an environment where the sow is uncomfortable, restless and potentially aggressive.[634]

625 D'Eath and Turner, above n 624, at 33

626 At 33

627 Knight, above n 584, at 11.

628 K.L. Chidgey, P.C.H. Morel, K.J. Stafford, I.W. Barugh "The performance and behaviour of gilts and their piglets is influenced by whether they were born and reared in farrowing crates or farrowing pens" (2016) 193 Livest. Sci. 51 at 51. KL Chigdey "Sow and piglet behavioral associations in farrowing pens with temporary crating and in farrowing crates" (2017) 20 JVet Behav 91, similarly found that where a gilt was born and raised in a pen and farrowed in a pen, piglets vocalized towards the gilt more than in other groups - particularly when the gilt was vocalizing towards the piglets, investigating them and touching them.

629 Chidgey et al, "The Performance and behaviour of gilts and their piglets is influenced by whether they were born and reared in farrowing crates or farrowing pens" at 51

630 Knight, above n 584, at 2

631 At 2 and 10

632 Johnson and Marchant-Forde, above n 62, at 141

633 Emma Baxter, Inger Lise Anderson and Sandra Edwards "Sow welfare in the farrowing crate and alternatives" in Marek Spinka (ed) Advances in Pig Welfare (Woodhead Publishing, Duxford, 2018) 27 at 28 – 29.

634 At 28 – 29

5.2.3 NATIONAL ANIMAL WEFLARE ADVISORY COMMITTEE'S VIEWS ON FARROWING CRATES

The code itself recognises the disadvantages of farrowing crates for the sow, including "the restriction of movement and a reduced ability to carry out nest building behaviours."[635] Additionally, in its report to the code NAWAC recognised the scientific literature recommending that "sows due to farrow should be kept individually in sufficiently large pens containing nest and activity areas."[636] NAWAC confirmed that:[637]

> When gilts farrow in crates, the provision of additional space lead to them displaying behaviour at parturition more closely resembling that seen in free-ranging sows (Jarvis et al., 2004). Enlarging a crate by 60% and adding straw reduced the tendency of piglets to behave aggressively during feeding later in life (Chaloupková et al., 2007a,b). Providing a back area to the farrowing crate fitted with mats, feeding and watering facilities resulted in the sows using it, being more active, and having fewer, non-productive nursings in late lactation (Devillers and Farmer, 2008).

The time limits placed on farrowing crates (five days prior to farrowing and a maximum of four weeks for lactation) contrast starkly with the recommended best practice outlined in the code, which provides that sows "should not be kept in farrowing crates for more than 10 days after farrowing."[638] Further, numerous studies have shown that piglet mortality is most likely within the first few days of birth, with "around half of total pre-weaning mortality [occurring] within the first 24 h of life."[639] In light of this, there seems to be little reason to confine a sow post-farrowing for up to four - five weeks – at least if piglet mortality is the justification for doing so.[640] In fact, NAWAC recognised in 2018 that while the code of welfare recommended a period of confinement of no more than 10 days, recent research suggested "that a much shorter time is feasible."[641] NAWAC suggested that this period could be as short as *four days* after the sow gives birth.[642]

Importantly, MPI has also acknowledged this in the Code of Welfare (Pigs) 2018 stating that "Most piglet mortality occurs within the first four days after farrowing."[643] In light of this, it is difficult to see how it could justify the much longer period permitted in minimum standard 10 (Managing Interactions between Sows and Piglets) of up to four – five weeks.[644]

More broadly, NAWAC has also recognised that:[645]

> …greater weight needs to be given to the requirement of each sentient individual in the system, and that welfare trade-offs (e.g. the needs of the sow vs. the needs of piglets) should be avoided…current approaches, where farrowing crates are used for up to four weeks post-farrowing, do not meet animal welfare obligations in that sows have their activity restricted for a longer period than is necessary.

635 Code of Welfare (Pigs) 2018 at 17
636 National Animal Welfare Advisory Committee, above n 130, at 14
637 At 17
638 Code of Welfare (Pigs) 2018 at 18
639 Johnson and Marchant-Forde, above n 621, at 163
640 Knight, above n 584, at 26
641 National Animal Welfare Advisory Committee, above n 199, at 2. In this response NAWAC noted recent researching suggesting that a much shorter time period of around four days could suffice to minimise piglet mortality, this being the main driver behind the use of farrowing crates.
642 At 2. In this response NAWAC noted recent researching suggesting that a much shorter time period of around four days could suffice to minimise piglet mortality, this being the main driver behind the use of farrowing crates.
643 Code of Welfare (Pigs) 2018 at 19
644 Code of Welfare (Pigs) 2018, Minimum Standard No. 10(f) states: "If sows are to be confined in farrowing crates for lactation, it must be for no more than four weeks after farrowing."
645 National Animal Welfare Advisory Committee, above n 199, at 6

Despite the recognition by NAWAC of the problematic nature of crates and the scientific literature recommending more space for sows and their piglets, the code and regulations nevertheless allows crates to be tightly confined.

Issues with compliance were also identified by the 2016 NAWAC report on the use of farrowing crates.[646] In particular, NAWAC noted that industry disagreed with the requirement to retain no more than 5% of sows in crates for a further week as nurse sows, and with the requirement to provide material that can be manipulated until farrowing. NAWAC outlined in this report that it "is anticipated that MPI compliance action will be taken to monitor these two aspects of the code during their upcoming inspection of all New Zealand's production pig farms"[647] – particularly in light of industry disagreement with these standards. The report also refers to possible measures by MPI to improve compliance with codes of welfare generally, including "through the proposed proactive inspection of all large production pig farms by MPI and through the Safeguarding our Animals, Safeguarding our Reputation programme."[648] It is unclear the extent to which this has been advanced.

5.2.4 ALTERNATIVES TO FARROWING CRATES

In the NAWAC report on the code of welfare, NAWAC compared farrowing crates to alternative systems including farrowing pens, group-based farrowing systems and extensive systems. NAWAC summarised these as follows:

- Farrowing pens: Sows in a farrowing pen system are able to turn around and "can express a higher level of maternal behaviour than in crates."[649] There is a variety of farrowing pen designs in use internationally, and these "often have piglet protection bars around the walls and the sow is restrained during parturition by a hinged gate…"[650]
- Group-based systems: NAWAC considered the use of such systems in its report, such as the deep-litter, group-based farrowing systems developed in Sweden and Switzerland. In these systems "[large] enriched communal areas are provided for a group of sows and their piglets. Often in these systems, sows farrow using traditional farrowing pens, after which they are returned to a large communal group pen where they all nurse together with their offspring. Various management systems are employed to manage the groups, minimise aggression and ensure piglet survival. Such systems have been shown to reduce the incidence of mastitis and to achieve good production results."[651] NAWAC noted that piglet mortality has traditionally been high in such systems and that they necessitate excellent stockmanship skills.[652]
- Extensive systems: NAWAC considered the use of extensive systems, being outdoor systems with lower stocking densities.[653] It noted a number of welfare issues associated with these including competition for food, aggression and climatic restrictions.[654]

646 National Animal Welfare Advisory Committee, above n 212
647 At 4
648 National Animal Welfare Advisory Committee, above n 212, at 5
649 "Many scientific reports show that farrowing pen design is of high importance for the performance of the sow and piglets at farrowing and lactation. The provision of a 'creep' area, where piglets can lie separate from the sow can help to prevent excessive piglet crushing (Verhovesk et al., 2007) and is often provided in these pens, although problems have been encountered when trying to encourage piglets to use this area during the first 2 days of life, as the piglets prefer to remain close to the sow at this time (Andersen et al., 2010)." National Animal Welfare Advisory Committee, above n 130, at 13
650 At 13
651 At 13
652 At 13
653 At 14
654 At 14

After weighing up these options, NAWAC found that there is "currently no single alternative farrowing system that meets all the welfare aims and has commercially acceptable levels of performance."[655] Similarly, in its 2016 review of the use of farrowing crates in New Zealand, NAWAC considered that no suitable alternatives were available to the use of farrowing crates that "provide [the] same welfare benefit to piglets and which maintain [the] same levels of productivity."[656] The review was accompanied by a 2015 economic analysis of farrowing systems.[657] NAWAC concluded that as a result, there was no need to amend the code.

However, in its original report to the code NAWAC recognised that other countries have long since banned farrowing crates, including Sweden and Norway (except under specific circumstances such as where a sow is exhibiting aggressive or other abnormal behaviour that puts piglets at risk).[658] Similarly, NAWAC noted:[659]

> Farrowing crates were banned in Switzerland in 1997, with a 10 year transitional period. Since this legislation came into force, many farms in Switzerland have introduced loose farrowing systems (Weber et al., 2009).

Despite the use of such alternatives in other jurisdictions, NAWAC did not give serious consideration to their adoption in New Zealand.

Subsequent studies have also found that alternative systems are viable in terms of facilitating sows' behavioural expression whilst minimising piglet mortality. Baxter *et al*. found that designed pen systems were the best alternative to farrowing crates in terms of balancing welfare needs and economic considerations.[660] An alternative pen called PigSAFE (Piglet and Sow Alternative Farrowing Environment) has been tested in at least three studies, which showed that piglet mortality occurred at similar levels to the farrowing crate environment.[661] There are also clear behavioural benefits in such systems, with sows being able to move around and perform maternal behaviours such as nest building. Further, Chidgey *et al*. found that "[behavioural] displays of sows in farrowing crates are limited, whereas pen-based alternatives to farrowing crates enable a greater range of behavioural expression, including interacting more with piglets."[662] The findings in this study were summarised by NAWAC in 2017 as follows:[663]

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655 National Animal Welfare Advisory Committee, above n 130, at 13

656 National Animal Welfare Advisory Committee, above n 212

657 Ministry for Primary Industries *Economic analysis of farrowing systems* (Ministry for Primary Industries, Information Paper No: 2016/06, April 2016)

658 National Animal Welfare Advisory Committee, above n 199, at 3. Similarly, Denmark has recently pledged to have 10% of its breeding herd raised in loose farrowing systems by 2021 and Austria pledged in 2009 to phase out farrowing crates by 2033, as cited by Baxter, above n 634, at 27

659 National Animal Welfare Advisory Committee, above n 130, at 18

660 E E. M. Baxter, A. B. Lawrence and S. A. Edwards "Alternative farrowing accommodation: welfare and economic aspects of existing farrowing and lactation systems for pigs" (2012) 6 Animal 96

661 SA Edwards, M Brett, S Ison, M Jack, YM Seddon, EM Baxter "Design principles and practical evaluation of the PigSAFE free farrowing pen" (Proceedings of the Fourth European Symposium on Porcine Health Management, Brugges, April 2012) at 113; SA Edwards, M Brett, JH Guy and EM Baxter "Practical evaluation of an indoor free farrowing system: the PigSAFE pen" (Proceedings of the 62nd Annual Meeting of the European Federation of Animal Science, Stavanger, Norway, August-September 2011) at 17; and Rebecca Morrison and Emma Baxter "Developing Commercially –Viable Confinement-Free Farrowing and Lactation Systems; Project 1A-105" (Final report prepared for the Co-operative Research Centre for High Integrity Australian Pork, July 2013)

662 K.L. Chidgey, P.C.H. Morel, K.J. Stafford, I.W. Barugh "Sow and piglet behavioral associations in farrowing pens with temporary crating and in farrowing crates" (2017) 20 J. of Vet.Behav 91at 91

663 Ministry for Primary Industries *Welfare Pulse* (Issue 23, November 2017) citing Chidgey et al. (2016) 176 Appl. Anim. Behav. Sci. 12 at 15

> …sows in pens performed more nursing vocalisations, more behaviour directed towards other sows and rooted the floor more than sows in crates, and were also more active once loose, spending more time standing, rooting the floor and performing more piglet-directed behaviours (investigation, touch and vocalisation towards piglets). Sows held in farrowing pens, once loose, expressed a greater repertoire of behaviour compared to sows in crates, including enhanced sow-piglet interactions.

Additionally, other methods can be used to ameliorate piglet mortality in non-crate systems, including selecting for sows that display the traits of calmness and protectiveness;[664] genetically selecting for smaller, healthier sows and smaller litter sizes; adequate environmental enrichment (including the provision of nest building material); increased space and hygienic and temporarily heated flooring; minimising physical and social stressors;[665] as well as the provision of design features that stimulate good maternal behaviour; and developing good human-animal relationships enabling the stock person to influence maternal behaviour.[666] Naya Brangenberg recommended the use of an underfloor heating pad, which she said piglets gravitate towards, thereby protecting them from being squashed by their mother.[667] Baxter *et al*. found that in the context of a loose-housed farrowing and lactation system, smaller nest sizes within pen systems were also more protective for piglets in terms of piglet mortality.[668]

NAWAC has recognised the benefits of some of these approaches. For instance, NAWAC stated, "having workers with good stockmanship is a key driver of piglet survival."[669] Additionally, NAWAC has recognised that facilitating the natural behaviour of sows in a conducive environment in which the sow can display her normal behaviours, can reduce the incidence of piglets being crushed:[670]

> …[the natural behaviours of the sow] can play an important role in preventing crushing of piglets in a farming situation, such as the sow entering her nest from the same angle every time and vocalising as she enters. This will get most of the piglets on their feet as the sow roots through the nest leaving a 'piglet free channel' in which to lie down. The lying down is performed very slowly under natural conditions. These behaviours together with the nest material and the tactile and acoustic stimuli from piglets constitute a protection against crushing. Due to the intensive conditions that many sows are kept in, the communication process may not be working effectively and hence piglets are crushed.

Loose-housing may also be a legitimate alternative. Hans Kriek of SAFE referred us to "[the] latest research from Sweden [which] shows that loose housing of sows can provide for the needs of both sows and piglets."[671] This research compared results between loose pens and temporary crating pens where the sow was confined during farrowing and for three days afterwards. It found that:[672]

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664 "One of the key components of survival in alternative, loose-housed farrowing systems is maternal behaviour and understanding the characteristics of sows that influence survival in such environments should be an essential component when developing new breeding indices." E. M. Baxter, S. Jarvis, L. Sherwood, M. Farish, R. Roehe, A. B. Lawrence, S. A. Edwards "Genetic and environmental effects on piglet survival and maternal behaviour of the farrowing sow" (2011) 130 Appl. Anim. Behav. Sci. 28.

665 Knight, above n 584, at 25

666 Free Farrowing "Can We Keep Piglets Safe Without Crates?" <https://www.freefarrowing.org/info/10/why_free_farrowing/33/can_we_keep_piglets_safe_without_crates>

667 Interview with Naya Brangenberg, above n 119

668 E. M. Baxter, O. O. Adeleye, M. C. Jack, M. Farish, S. H. Ison, S. A. Edwards "Achieving optimum performance in a loose-housed farrowing system for sows: The effects of space and temperature" (2015) 169 Appl. Anim. Behav. Sci. 9

669 National Animal Welfare Advisory Committee, above n 199, at 3

670 National Animal Welfare Advisory Committee, above n 130, at 15

671 SAFE "SAFE and NZALA File Proceedings Against Government for Failure to Ban Farrowing Crates" (12 February, 2019) <https://www.safe.org.nz/blog/post/safe-and-nzala-file-proceedings-against-government-failure-ban-farrowing-crates> citing A. Olsson, J. Botermans, J. England "Piglet mortality – A parallel comparison between loose-housed and temporarily confined farrowing sows in the same herd" (2018) 68 Acta Agr Scand a-an 52.

672 SAFE submission to the Primary Production Committee, 28 January 2019, citing the study: A. Olsson, J. Botermans, J. England "Piglet mortality – A parallel comparison between loose-housed and temporarily confined farrowing sows in the same herd" (2018) 68 Acta Agr Scand a-an 52.

> …piglet survival was a complex and multifactorial issue concluding that aspects of management, sow attributes (e.g. age, size and health), litter size, as well as housing interact to contribute to survivability.

The study found a clear link between a reduction in mortality rate and smaller litter sizes (see Figure 3), as well as increased survival in litters born to pigs under the age of 1 year old in loose farrowing systems (with piglets born to intermediate or older sows experiencing more crushing in loose farrowing systems as compared to temporary crating). There was a small increase in mortality associated with loose farrowing, compared to temporary crating, "on average this was around 0.4 piglets per litter and was not consistent across every parity."[673] However, the authors recognised that different studies have reached contradictory findings on mortality rates, resulting from different farrowing environments.[674] The study also found that there was an "increase in farrowing problems… recorded for sows temporarily confined at farrowing."[675] This study informed SAFE's submission to the Primary Production Committee in support of "NAWAC's recommendation in their 2016 advice to the Minister, that the pig industry should breed selectively for improved piglet survivability as an animal welfare priority."[676]

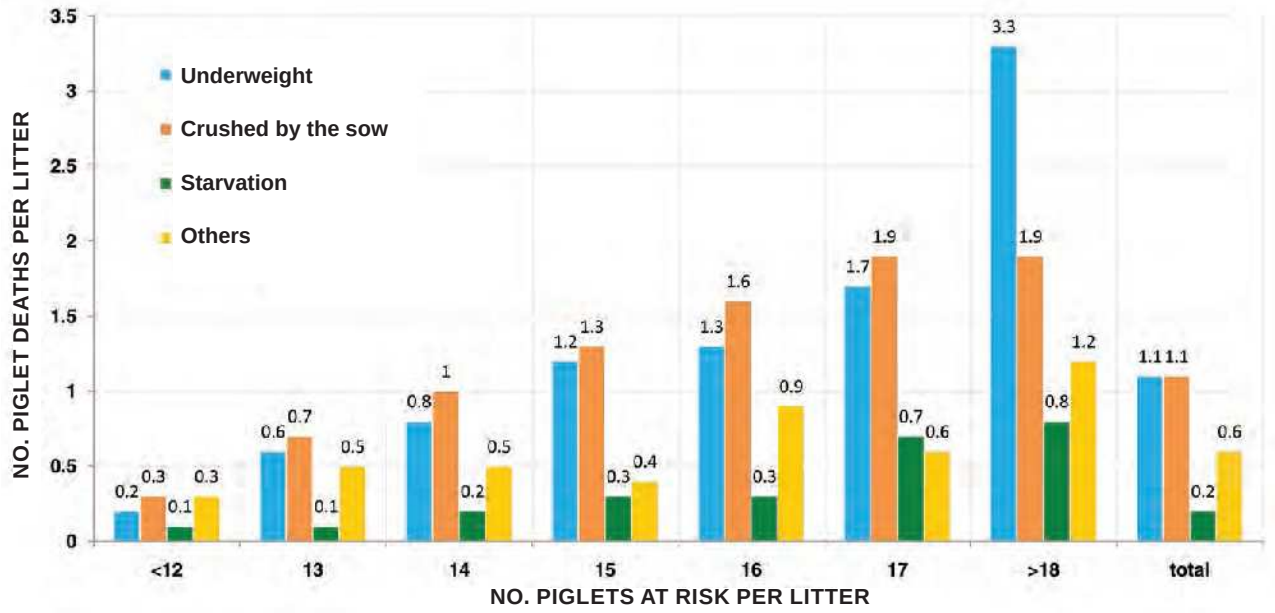

Figure 3: Number of dead piglets per litter within different litter sizes and with specified causes of death. Reproduced from Olsson, Botermans & Englund (2019)[677]

We have re-drawn this figure to make it more legible, however no substantive changes have been made.

Finally, a recent study by Min et al (2020) found no difference in sow productive performance, reproductive performance and colostrum composition as between sows that were individually and group-housed. As such, it "was concluded that group housing systems could be used to replace individual stalls in commercial sow units."[678]

673 SAFE, above n 673

674 Knight, above n 584, at 20. A further outline of the range of studies on piglet mortality as a result of farrowing environment and that these studies are contradictory is outlined here: A. Olsson, J. Botermans, J. England "Piglet mortality – A parallel comparison between loose-housed and temporarily confined farrowing sows in the same herd" (2018) 68 Acta Agr Scand, Introduction

675 SAFE, above n 673

676 SAFE, above n 673

677 SAFE, above n 673

678 Y. Min, Y. Choi, J.Kim, D. Kim, Y. Jeong, Y. Kim, M. Song, H. Jung "Comparison of the Productivity of Primiparous Sows Housed in Individual Stalls and Group Housing Systems" (2020) 10 *Animals* 1940

In a 2018 submission to the Primary Production Committee, NAWAC said of its 2016 review of farrowing crates that it:[679]

> …does not wish to relitigate its previous advice as provided to the Minister in 2016. The committee considers that the work was done in good faith using the best information available and provided a balanced decision that was appropriate at that time.

It proposed "that the discussion should now be directed towards implementing solutions that will improve the welfare of pigs in New Zealand's indoor farrowing systems."[680] In order to achieve this NAWAC recommended the development of a 'conversion timeline' for industry to implement the recommended best practice sections outlined in the code. This would entail specifying a date by which a proportion of sows would be in management systems in which they spend no more than the agreed number of days in crates when farrowing and which ensure that nest building materials are provided (as required by minimum standard 10(h)).[681] This process would be developed by a:[682]

> …multi-organisational group with the pig industry to develop the detail of the process, including such regulatory changes as will be required, and such financial support and assistance to pig farmers using indoor farrowing systems, as will be needed.

Amending the codes and regulations in regards to farrowing crates would be a more certain way of achieving the change NAWAC now accepts as desirable. It is also required as a result of the High Court's recent judgement in judicial proceedings brought by NZALA and SAFE.[683]

5.2.5 PROVISION OF NESTING MATERIAL IN FARROWING CRATES

Minimum standard 10 (Managing Interactions between Sows and Piglets) provides as a recommended best practice that "Sows should be provided with nest building material e.g. straw from at least 48 hours before farrowing."[684] Minimum standard 10(h) further provides that "Sows, in any farrowing system constructed after 3 December 2010, must be provided with material that can be manipulated until farrowing."[685]

Farrowing pigs are highly motivated to engage in nest-building activities. Held *et al*. recognised, "the only resource to approach the value of food is the value of nesting material… prior to farrowing."[686] Similarly:[687]

> …studies of the behaviour and physiology [of pregnant sows show that] additional space and provision of nesting substrates reduce behavioural and physiological indicators of distress in pre-parturient sows (e.g. Jarvis et al., 1997; Damm et al., 2002).

Nest-building has been linked with higher levels of oxytocin in sows and increased "positive maternal behaviours during farrowing",[688] such as a reduced risk of crushing and greater suckling success for

679 National Animal Welfare Advisory Committee, above n 199, at 1
680 At 3 and 6
681 At 3 and 6
682 At 1
683 *The New Zealand Animal Law Association v The Attorney General*, above n 4
684 Code of Welfare (Pigs) 2018, Minimum Standard No. 10, Recommended Best Practice (b)
685 Minimum Standard No. 10(h) at 18
686 Suzanne Held, Jonathan J. Cooper and Michael T. Mendl "Advances in the Study of Cognition, Behavioural Priorities and Emotions in Marchant-Forde, Jeremy N. (ed) *The Welfare of Pigs* (Springer, USA, 2009) 47 at 73
687 At 72
688 Baxter et al, above n 634, at 28 – 29

piglets.[689] Baxter *et al*. note that several authors have linked high nest-building activity and a reduced risk of crushing: "The more complete and functional the nest is, the more likely the sow is to end nest building and begin the more somnolent farrowing phase."[690]

Conversely, Baxter *et al*. found that not being able to nest during farrowing leads to elevated plasma cortisol levels in sows (indicating higher levels of stress).[691] Weaver *et al*. found that inability to nest leads to increased frequencies of stereotyped movements and increased restlessness.[692] It may also lead to sows carrying out nesting behaviours when piglets are born, leading to further posture changes and potentially to a higher risk of piglets being crushed.[693]

A number of studies have identified the benefits of providing a certain quantity and/or type of nesting material. A 2014 report cited by MPI found that a lower number of injuries occur in piglets where a large amount of straw is provided (instead of small daily amounts being provided).[694] It found too that the provision of such material led to piglets with higher weight gain over the first five days of life and higher body weight at weaning. MPI stated this indicates:[695]

> …that the provision of large amounts of straw has a positive influence on the welfare of piglets, as well as the sow, by giving her the opportunity to perform nest building behaviour.

Bolhuis *et al*. found that the provision of jute sacks and straw balls, while not sufficient in themselves for pigs to perform appropriate nest building behaviour and create a completely satisfactory nest, were favourable.[696] For example, pigs were attracted to these materials and spent significantly more time on manipulating nesting material and less time manipulating the floor, rope and fence than sows without these nesting materials. Da Silva *et al*. recommended the use of nesting materials such as straw branches.[697] Rosvold *et al*. found straw compared more favourably than peat as a nesting material, with straw resulting in more time spent on nest building, increased lying time and less stereotypies.[698] And Swan *et al*. found that sows seem to benefit more from newspaper than straw or wood shavings (although this may have been due to the use of slatted floors, which caused wood shavings and straw to fall through and because sows ate some of the straw).[699] Baxter *et al*. also recommended the provision of malleable flooring (e.g. consisting of earth or sand) "to accommodate nest building activities."[700] Da Silva *et al*. similarly recommended that earth or sand be provided at least 24 hours before parturition.[701]

689 Baxter et al, above n 619, at 582
690 At 582
691 At 28 – 29
692 Sean Weaver and Michael Morris "Science, pigs, and politics: a New Zealand perspective on the phase-out of sow stalls" (2004) 17 J Agr Environ Ethic 51 at 56
693 Johnson and Marchant-Forde, above n 621, at 161
694 R. Westin, N. Holmgren, J. Hultgren, B. Algers "Large quantities of straw at farrowing prevents bruising and increases weight gain in piglets" (2014) 115 Prev. Vet. Med.181.
695 Ministry for Primary Industries *Welfare Pulse* (Issue 18, June 2015) at 14 citing Westin R et al. (2014) 115 Prev. Vet. Med. 181
696 J.E. Bolhuis, A.M.E. Raats-van den Boogard, A.I.J. Hoofs, N.M. Soede "Effects of loose housing and the provision of alternative nesting material on peri-partum sow behaviour and piglet survival" (2018) 202 Appl. Anim. Behav. Sci. 28
697 C.A. da Silva, X. Manteca, C.P. Dias "Needs and challenges of using enrichment materials in the pig industry" (2016) 37 Semina: Ciências Agrárias at 531
698 E.M. Rosvold, R.C. Newberry, T. Framstad, I. Andersen "Nest-building behaviour and activity budgets of sows provided with different materials" (2018) 200 Appl. Anim. Behav. Sci. 36.
699 K. Swan, O.A.T. Peltoniemi, C. Munsterhjelm, A. Valros "Comparison of nest-building materials in farrowing crates" (2018) 203 Applied Animal Behaviour Science 1-10
700 Baxter et al, above n 620, at 586
701 Silva et al, above n 698, at 531

NAWAC recognised the importance of nest-building in its accompanying report on the Code of Welfare (Pigs) 2010. This report acknowledged "Nesting behaviour is the most critical element of farrowing behaviour for the sow's welfare."[702] Hence, minimum standard 10(h) required that sows in a farrowing system must be provided with material that can be manipulated until farrowing. NAWAC have stated that this section requires sows to have "access to materials that promote nest building behaviour expressed in the 48 h before farrowing, a behaviour that is also beneficial to the sow's emotional state."[703]

Unfortunately, it appears that nest-building activities are frustrated within a farrowing crate environment. NAWAC has "been concerned for some time that the farrowing crate system is not compatible with the welfare benefits intended by minimum standard 10(h)."[704] This is attributable to the lack of space provided for sows in farrowing crates and the lack of any provisions in the code specifying the extent of what's required for nesting materials prior to farrowing e.g. how much material should be provided; what this material should consist of;[705] and what surfaces would best accommodate nest-building. For example, NAWAC noted in 2015:[706]

> [The] minimum standard to allow for nesting behaviour is not being met in many cases. Most farms seem not to [be] providing nesting material because the slatted system cannot handle substances like straw.

Similarly, MPI stated in 2017 that the suggested use of straw for nesting material "presented significant compliance issues for the industry in slatted systems, particularly around animal hygiene and labour"[707] and that:[708]

> The existing minimum standard is currently not being met in a meaningful way by industry due to uncertainty about requirements and lack of meaningful welfare benefit that existing materials provide.

A proposed regulation regarding a requirement to provide nesting materials for farrowing sows has never been realised[709] - as outlined by MPI, "nesting material remains an area for potential future regulation."[710]

Additionally, nesting materials are only required for farrowing systems constructed after 3 December 2010.[711] This appears anomalous. As the NZALA outlined in its submission on the proposed Animal Welfare (Care and Procedures) regulations, there should at least be a sunset clause providing for a date at which those cages constructed prior to 2010 should have to comply.[712] There is no reason why a loophole should exist for these older cages.

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702 National Animal Welfare Advisory Committee, above n 130, at 12
703 National Animal Welfare Advisory Committee, above n 199, at 3 and 6
704 At 3
705 For instance, Naya Brangenberg informed us that her farm maintains 80% grass cover, such that sows can collect their own grass for nesting. They are also provided with straw. Interview with Naya Brangenberg, above n 119
706 National Animal Welfare Advisory Committee Minute "General Meeting" (20 May 2015) at [C 3]
707 Ministry for Primary Industries *Appendix three: Animal welfare regulatory proposals that will not be progressed at this time at 2*
708 At 2
709 Ministry for Primary Industries, above n 41, at 14 and 33
710 At 33
711 Code of Welfare (Pigs) 2018, Minimum Standard No 10(h) at 18
712 National Animal Welfare Advisory Committee *Submission on the Proposed Animal Welfare Regulations* (May 2016) at 22

5.3 SOW STALLS

Sow stalls are defined in the code of welfare as "An enclosure in which a pig is kept individually and that prevents the pig from turning around, but does not include a farrowing crate."[713]

After reviewing the relevant scientific literature and public submissions, NAWAC decided in its 2010 report on the code of welfare that "sow stalls should be phased out entirely to enable sows to meet their behavioural needs."[714] Dry sow stalls (being stalls used for non-mating purposes) were subsequently phased out and their use after 3 December 2015 was banned.[715] However, sow stalls can still be used for the purposes of mating under minimum standard 11(a) (Managing Interactions between Sows and Piglets) of the code of welfare.

The standard provides that pigs must not be confined to stalls unless it is for the purpose of mating; the confinement must be for no more than seven days per reproductive cycle; and the pigs must be released from the stalls as soon as practicable after mating.[716] Minimum standard 11(c) further provides that sows and gilts housed in stalls for the purposes of mating must be able to stand in their natural stance without contact with any side of the stall and be able to lie comfortably on their sides without disturbing neighbouring sows or gilts.[717] Regulation 27 of the Animal Welfare (Care and Procedures) Regulations 2018 reiterates these requirements and also requires owners to keep records documenting compliance with them.[718]

Despite the time restriction on the use of sow stalls and the spatial requirements prescribed by minimum standard 11, sow stalls still severely restrict the movement and thus the behavioural expression of pigs - sows in these stalls are not even able to turn around. The continued use of such stalls therefore remains problematic.

Hans Kriek of SAFE also noted:[719]

> There is no need for [sow stalls] in the first place and by allowing farmers to keep these stalls, there is a real risk of some using these stalls illegally as dry sow stalls, something that we have already encountered.

This concern appears to have merit. For instance, if an inspector comes across sows confined in a stall and the farmer asserts that they have only been used during the 7-day mating period, there appears to be no way for the inspector to verify if this is true or if they are being used illegally for extended periods, contrary to minimum standard 11.[720]

713 Code of Welfare (Pigs) 2018 at 36

714 National Animal Welfare Advisory Committee, above n 130, at 22

715 Code of Welfare (Pigs) 2010, Minimum Standard 11(e) and (f)

716 Minimum Standard No. 11(a) at 19

717 Minimum Standard No. 11(c) at 19

718 Animal Welfare (Care and Procedures) Regulations 2018, regulation 27(2)

719 Email from Hans Kriek (SAFE Ambasssador) to the author in response to the question "Sow stalls have been banned since 2015 except for the purposes of mating. The Code states that confinement in these circumstances must be for no more than 7 days per reproductive cycle and that pigs must be released from the stalls as soon as possible after mating. Does SAFE have any concern over the continued use of sow stalls within these parameters?" (14 November 2019)

720 SAFE released footage of sows being kept in sow stalls in 2018. NZ Pork outlined that the short-term use of such stalls is not illegal. However, it would be difficult to verify this. "SAFE releases video of 'barbaric' pig stalls on South Island farm" *Newshub* (online ed, New Zealand, 12 July 2018)

5.3.1 RECENT HIGH COURT DECISION IN THE NEW ZEALAND ANIMAL LAW ASSOCIATION V THE ATTORNEY GENERAL [2020] NZHC 3009

The High Court recently considered the issues of both farrowing crates (discussed at [5.2]) and sow stalls in judicial review proceedings brought by NZALA and SAFE.

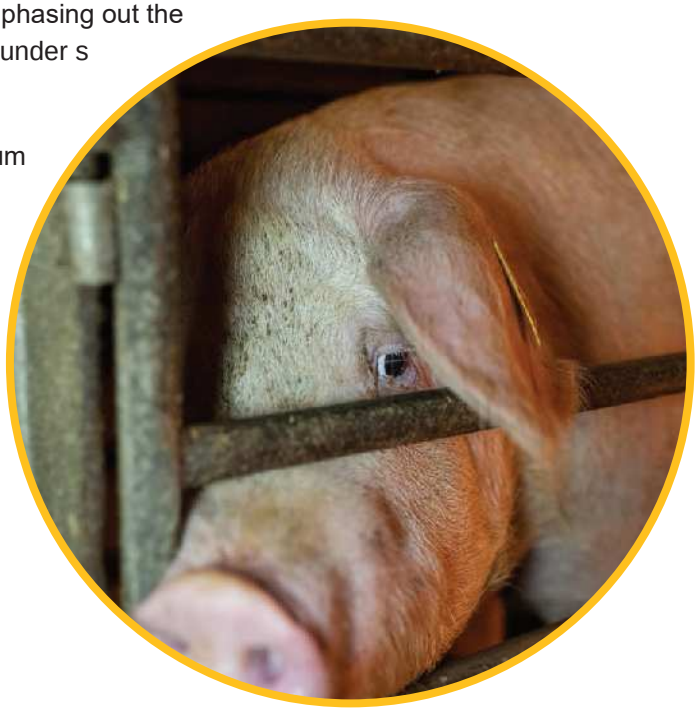
It noted that NAWAC's commentaries in both the 2010 and 2018 codes made it "plain that NAWAC considered that the practice of using mating stalls should stop."[721] For example, in both the Code of Welfare (Pigs) 2010 and the Code of Welfare (Pigs) 2018 NAWAC stated (emphasis added): [722]

> NAWAC wants to see indoor housing systems shift to those *in which the sow is not confined in a stall at all, including for mating*. NAWAC strongly encourages the industry to identify and adopt new systems…thus eliminating the need for stalls during mating and hence eventually adopt a system in which stalls would not be required for management at all.

In the Court's view, these commentaries clearly indicated that NAWAC recognised the practice of using stalls should cease, including for the purposes of mating. Given this, the Court found the continued use of mating stalls under regulation 27 and minimum standards 11(a), (c) and (d)[723] "circumvented Parliament's intention in enacting the 2015 Amendment"[724] and is "contrary to the purposes of the Act".[725] For these reasons, both provisions were deemed unlawful and invalid.[726] The Court directed the Minister to:[727]

a) consider recommending new regulations phasing out the use of farrowing crates and mating stalls under s 183A(2) of the Act; and

b) consider making such changes to minimum standards 10 and 11 in the 2018 Code accordingly.



721 High Court (press release), above n 5, at [14]

722 Code of Welfare (Pigs) 2018 at 20, Code of Welfare (Pigs) 2010, cl. 5.2

723 Minimum Standard No. 11(a) states "Pigs must not be confined to stalls unless – i) the confinement is for the purpose of mating; and the confinement is for no more than 7 days per reproductive cycle; and iii) the pigs are released from the stalls as soon as practicable after mating." Minimum Standard No. 11(c) provides "Where sows and gilts are housed in stalls for the purpose of mating, they must be able to stand in their natural stance without contact with any side of the stall and be able to lie comfortably on their sides without disturbing neighbouring sows or gilts." Minimum Standard No. 11(d) provides "Sows and gilts that are in stalls for the purpose of mating must have a dry, smooth, non-slip sleeping area."

724 High Court (press release), above n 5, at [15] and [16]

725 At [15] and [16]

726 At [18]

727 At [20]

5.4 SPACE

Minimum standard 6 (Housing and Equipment) establishes that all:[728]

> …group housed pigs must be able to stand, move about and lie down without undue interference with each other in a space that provides for separation of dunging, lying and eating areas.

Minimum standard 6(c) further provides for an equation to determine the "minimum unobstructed lying space allowance for grower pigs." This calculation is as follows: Area (m^2) per pig = 0.03 x liveweight$^{0.67}$ (kg).[729] This formula is now also contained in regulation 25 of the Animal Welfare (Care and Procedures) Regulations 2018.

However, the formula provided only represents the requirements for the stationary area occupied by a growing pig that is lying down. Neither minimum standard 6 nor regulation 25 specifically address the space that is required for a pig to move around so as to meet its physical, health and behavioural needs – despite the fact that MPI has stated that "this is the minimum lying space requirement, and may not be the ideal space for welfare requirements in all situations."[730]

The amount of space provided for through this calculation is highly restrictive. We used MPI's Pig Space Calculator to determine what the stocking density for a pig might look like in practice.[731] Given an average weight of 69kg per pig,[732] 195 pigs could be kept in an area 100 m^2. This equates to an area of 0.51 m^2 per pig. Cho and Kim reviewed the optimum stocking density for pigs with reference to growth performance and stress on pigs.[733] The authors concluded that nursery (10kg – 30kg), growing (30kg – 85kg) and finishing pigs (85 kg – 110kg) require space allowances of greater than 0.3 m^2, 0.6 m^2 and 0.9 m^2, respectively. Under MPI's calculator, nursery pigs would have 0.14 m^2 (at 10kg) – 0.29 m^2 (at 30kg); growing pigs would have 0.29 (at 30 kg) – 0.59 m^2 (at 85 kg); and finishing pigs would have 0.59 m^2 (at 85 kg) – 0.67 m^2 (at 110 kg). These space allowances are not commensurate with Cho and Kim's findings in regards to finishing pigs weighing 85 kg – 110 kg, which recommend that pigs at this weight have a spatial allowance of 0.9 m^2 per pig – rather than the 0.67 m^2 provided for in MPI's calculator.

728 Code of Welfare (Pigs) 2018, Minimum Standard No. 6(b). Minimum standard No. 12 (Managing Boars) at 20 provides for an equivalent provision in relation to boars, stating that boars must have sufficient space to stand up, turn round and lie down and also for separation of dunging, lying and eating areas.

729 Minimum Standard No 6(c)

730 Ministry for Primary Industries, above n 565

731 Ministry for Primary Industries "Pig Space Calculator" <https://www.agriculture.govt.nz/protection-and-response/animal-welfare/codes-of-welfare/resources/pig-space-calculator/>

732 Pig Progress "New Zealand's pig industry: Surviving through isolation" <https://www.pigprogress.net/World-of-Pigs1/Articles/2017/10/New-Zealands-pig-industry-Surviving-through-isolation-200451E/>

733 J.H. Cho and I.H. Kim "Effect of stocking density on pig production" (2011) 10 Afr. J. Biotechnol. at 13688.

Kim *et al*. considered optimal space allowance for pigs at specific growth stages based on body weight that would maximise performance and reduce stress and the incidence of inflammatory responses in pigs.[734] The following table outlines what the authors recommended as compared to the spatial allowances provided for using MPI's calculator:

Body Weight (kg)	Space Allowance (m^2 per pig) – Kim et al.	Space allowance (m2 per pig) – MPI calculator
11 – 25	0.24	0.14 – 0.26
25 – 45	0.44	0.26 – 0.38
45 – 65	0.64	0.38 – 0.49
65 – 85	0.78	0.49 – 0.59
85 – 115	0.80	0.59 – 0.72

The spatial allowances in New Zealand are lower than what is recommended in Kim *et al*. in four out of the five weight ranges identified, above.

Fu *et al*. tested pigs with a weight range of 75.2kg +/- 2.7kg at stocking densities of 0.8 m^2 per pig, 1.2 m^2 per pig and 1.6 m^2 per pig. They found that the optimal stocking density is 1.2 m^2 per pig.[735] At this stocking density, pigs had less lesions on the ears, front, middle and hind-quarters; spent less time participating in negative social behaviour; had less manure on their bodies; and had a more normal body surface temperature when compared to pigs at a stocking density of 0.8 m^2 per pig. Total scores of lesions on the body increased as stocking density intensified, suggesting that 1.6 m^2 per pig would be a more appropriate stocking density. However, pigs showed more positive social behaviours at a stocking density of 1.2 m^2 in this study and this, alongside optimal building utilisation, led the authors to consider this the most appropriate stocking density. Regardless, this spatial allowance is well above what is provided for in the New Zealand code of welfare, with the stocking density of 1.2 m^2 per pig equating to a factor of 0.066 to be used in the equation outlined above– this is double the factor used at minimum standard 6(c) of 0.03 and exceeds even the recommended best practice of 0.047.[736]

Other studies have recommended even higher spatial allowances in the range of 2.0 – 2.4 m^2 per animal, as well as the use of barriers in pens and full-body length feeding stalls in pens to minimise aggression.[737] Weaver and Morris canvassed a number of these studies:[738]

> Sow performance has been shown to improve steadily as the space allocation for pigs (at an initial weight of 55.5 kg) was increased to 1.20m^2 (Brumm, 1996). The growth rate of adult pigs improved when space allowance increased to 1.80m^2 (ibid.). Weng et al. (1998), monitored injury, aggression, and time spent foraging when 6 sows were kept in a pen with a space allocation of 2.0, 2.4, 3.6 and 4.8 m^2 per adult pig. Based on results from the study, the authors recommended a space requirement of between 2.4, and 3.6m^2 per sow.

734 K. H. Kim, K. S. Kim, J. E. Kim, D. W. Kim, K. H. Seol, S. H. Lee, B. J. Chae and Y. H. Kim "The effect of optimal space allowance on growth performance and physiological responses of pigs at different stages of growth" (2017) 11 Animal 478.

735 L. Fu, H. Li, T, Liang, B. Zhou, Q. Chu, A.P. Schinckel, X. Yang, R. Zhao, P. Li and R. Huang "Stocking density affects welfare indicators of growing pigs of different group sizes after regrouping" (2016) 174 Appl. Anim. Behav. Sci. 42.

736 At 43

737 Niamh E. O'Connell "Housing the Fattening Pig" in Marchant-Forde, Jeremy N. (ed.) *The Welfare of Pigs* (Springer, USA, 2009) 189 at 192

738 Weaver and Morris, above n 693, at 56

Such spatial allowances can further be contrasted with the space pigs are provided with on free-range farms. Free-range pig farmer Naya Brangenberg stated that the free-range farming guidelines from NZ Pork specify the provision of 18-20 hectares for 500 pigs.[739] This equates to 36 – 40 m^2 per pig.

There are numerous welfare risks associated with not providing pigs with sufficient space. As Hemsworth *et al*. stated:[740]

> Although group housing facilitates social living, group housing of gestating sows raises different welfare considerations to stall housing, such as high levels of aggression, injuries and stress for several days after mixing at least, as well as subordinate sows being underfed due to competition at feeding (Barnett et al. 2003).

Increased space enables pigs to more easily escape aggressors.[741] In contrast, as stocking density increases, the percentage of negative social behaviour increases,[742] as do body lesions[743] and manure on the body (suggesting that pigs are no longer able to separate lying and defecating areas).[744] High stocking densities impact on growth performance due to pigs finding it more challenging to gain access to the feeder, and potentially due to psychological stress.[745] Insufficient space leads to higher stress responses (e.g. higher plasma cortisol responses); increased incidences of tail biting and other aggressive behaviour; increased skin lesions as a result of aggressive behaviour; and reduced humoral immune responses.[746]

The NAWAC report on the Code of Welfare (Pigs) 2010 recognised differences in public opinion regarding the amount of space required for pigs, analysed scientific data regarding space requirements, and considered the financial implications of increasing space requirements for grower pigs.[747] NAWAC then acknowledged that pigs do require more space than what is provided for in practice:[748]

> Based on emerging international research, NAWAC believes the current industry guidelines for space requirements need to be reviewed as 10-50% more space may be required to provide for all pigs' needs, depending on their level of activity and the thermal conditions.

739 Interview with Naya Brangenberg, above n 119
740 Hemsworth et al, above 187, at 26
741 O'Connell, above n 738, at 192
742 S.A. Schmolke, Y.Z.Z. Li, H.W. Gonyou, "Effects of group size on social behavior following regrouping of growing-finishing pigs" (2004) 88 Appl. Anim. Behav. Sci. 27.
743 H.M. Vermeer, K.H. de Greef, H.W.J. Houwers "Space allowance and pen size affect welfare indicators and performance of growing pigs under Comfort Class conditions" (2014) 159 Livestock Sci. 79–86 and S.P. Turner, M. Ewen,J.A. Rooke, S.A. Edwards "The effect of space allowance on performance, aggression and immune competence of growing pigs housed on straw deep-litter at different group sizes" (2000) 66 Livest Prod Sci. 47.
744 Fu et al, above n 736, at 49
745 O'Connell, above n 738, at 193
746 At 193 – 194
747 Being "4.5% increase in price and a 4.8% decrease in the quantity of pig meat produced." National Animal Welfare Advisory Committee, above n 130, at 9
748 Code of Welfare (Pigs) 2018 at 12

The report continued:[749]

> NAWAC believes more space is required to provide for all pigs movement and social needs, and has therefore included a recommended best practice and other statements within the code encouraging farmers to provide more space. In addition, above 21℃, pigs require more space to be able to lose heat and maintain their body temperature. In warmer environments pigs choose to lie further away from conspecifics and display less huddling behaviour in an attempt to remain cool. Therefore at higher temperatures, pigs require additional space to enable them to thermoregulate effectively (Huynh et al., 2005). Therefore, the formula for pigs to be able to lie fully recumbent (Area (m^2) per pig = 0.047 x live weight$^{0.67}$ (kg) has been included as a recommended best practice. In addition providing more space is included as one of the measures to reduce overheating of pigs, in the housing temperature section.

NAWAC also recognised in its report that pigs are highly motivated to explore and engage in other behaviours such as rooting and foraging but that these behaviours are frustrated in many of today's farming systems:[750]

> Commercially bred pigs that were examined in a semi-wild environment showed a high level of activity. In 31% of observations they were grazing, in a further 21% rooting with their snouts, and in another 23% working over the enclosure (walking and nosing the ground). They used the rooting pad of their snout to level out roots and overturn tussocks of grass, raked with their forelegs, gnawed at roots and other items and wallowed in mud in warmer weather. Being social animals, each member of the group carried leaves and grass to the communal nesting site and used a dunging area well away from this sleeping area. There was very little aggression, what there was being associated with the delivery of foods. However, in this situation, threatened pigs could simply move away from the aggressor (Stolba and Wood-Gush, 1989). If given the opportunity within a domestic environment to express behaviours such as rooting, exploration, grazing, wallowing, dunging away from the nesting site and performance of interactive behaviours with conspecifics, pigs will perform these behaviours. However, despite pigs possessing the motivation to perform these behaviours, many of today's housing systems do not provide the space or enrichment that will enable them to do so.

The NAWAC report also recognised that insufficient space in regards to group housed sows leads to aggression and injury among pigs.[751]

Despite recognising that pigs require more space than what the minimum standards and regulations provide for (and the dangers associated with a lack of space), NAWAC refrained from amending the code of welfare or regulations to facilitate pigs having more space. Instead it has included more generous space allowances in the recommended best practice section of the code and in the general information section of minimum standard 6.[752] These more generous provisions are not mandatory. NAWAC stated that its decision was in part due to a lack of information available at the time regarding the space requirements for group-housed sows:[753]

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749 National Animal Welfare Advisory Committee, above n 130, at 9

750 At 19

751 "However, scientific evidence has shown that insufficient space in group housed sows increases the consequences of aggressive behaviour at mixing and induces chronically raised cortisol levels (Barnett et al., 2001) as well as causing a higher incidence of skin lesions particularly on the feet and legs. These injuries can be inflicted by contact with pen fittings or flooring, or non-agonistic interactions between individuals such as gilts stepping on each other (Harris et al., 2006)…" National Animal Welfare Advisory Committee, above n 130, at 9

752 Code of Welfare (Pigs) 2018 at 13 – 14. "Total space requirements to meet movement and social needs may have to be increased in some situations, depending on the interaction of a number of factors characterising the housing and management system, including feeding strategies, group size, age, breed, temperature, insulation, ventilation, pen shape, flooring, lighting and other husbandry factors. The same factors apply to space requirements for group housed sows, noting that the smaller the size of the group the more space per sow is required. Increased space allowance and provision of hide areas (visual barriers) for group housed sows reduces the amount and effects of aggression."

753 National Animal Welfare Advisory Committee, above n 130, at 9

> Currently, the appropriate space allowance or optimum group size for sows in group housing systems is unknown. There is a lack of knowledge about the minimum amount of space required to allow sows to express normal behaviour and to perform behavioural interactions such as moving, exploring and socialising with conspecifics.

However, research both prior and subsequent to NAWAC's report shows that more space is necessary to meet the welfare needs of pigs and NAWAC has clearly recognised that more space needs to be provided. This minimum standard is thus in need of review.

We note that in reviewing this aspect of the code, NAWAC will also need to provide for pigs to be genetically selected such that they can thrive in more extensive systems. For example, Don C. Lay, Jr. and Jeremy N. Marchant-Forde have stated that:[754]

> Characteristics that enable sows to live in single housing will not serve them well if they are to be kept in groups. For instance, a sow in a single stall need not compete for feed or protect herself from aggression. In a group housing system, these traits will likely be very important for her survival. To ensure optimum welfare of swine, further selection criteria will need to be addressed that specifically focus on welfare.

Any amendments to minimum standard 6 should address this issue.

5.5 SHELTER

Minimum standard 5(a) (Shelter for Pigs Outdoors) outlines that when pigs are farmed outdoors, they must have access at all times to shelter that is adequately ventilated and provides protection from extremes of heat and cold.[755] Minimum standard 5(b) further outlines that pigs must have access at all times to "a dry area that is large enough to allow the pigs to stand up, turn around and lie down in a natural position."[756] These standards are reinforced by regulation 24 of the Animal Welfare (Care and Procedures) Regulations 2018, which provides that pigs must have access to shelter and dry lying areas. The regulation further outlines that pigs must have access to a structure they can access at any time which is dry and ventilated – but not draughty – and protects them from extreme heat and cold; that is big enough for them to stand up, lie down, and turn around in easily; and that does not allow droppings or urine to accumulate.[757]

However, the code does not address what happens if there is continuously bad weather and pigs are forced to use the shelter often, meaning there is little space to move around in – which could contribute to aggression and subsequent injury in pigs. Further, MPI has stated that stocking densities for pigs kept outdoors will be established by local Government regulations and "depend on the nature of the land and rainfall."[758] It is unclear whether such regulations have been promulgated and where to find them. This lack of clarity is problematic, especially given the scale of New Zealand's outdoor pig breeding sector, which "makes up around 40 per cent of the industry."[759]

754 Jr. Don C. Lay and Jeremy N. Marchant-Forde "Future Perspectives of the Welfare of Pigs" in Jeremy N. Marchant-Forde (ed) *The Welfare of Pigs* (Springer, USA, 2009) at 340.
755 Code of Welfare (Pigs) 2018, Minimum Standard No. 5(a) at 11
756 Minimum Standard No. 5(b) at 11
757 Animal Welfare (Care and Procedures) Regulations 2018, regulation 24
758 Code of Welfare (Pigs) 2018 at 12
759 NZ Pork *New Zealand Pork Industry Board Annual Report 2018* at 3

5.6 BEHAVIOURAL NEEDS

The requirement to facilitate the behavioural needs of pigs is provided by minimum standard 9 (Behaviour), which states:[760]

> …[pigs] must be managed in a manner that provides them sufficient opportunities to express and satisfy their normal behaviours. These included but are not limited to feeding, drinking, sleeping, dunging and urination, vocalisation, thermoregulation, and social contact.

Minimum standard 9 includes example indicators, including the indication of no more than 15% of pigs having "skin lesions, bites and scratches from fighting at any one time."[761] However the standard does not provide for other normal behaviours such as play, foraging, rooting, exploration or wallowing,[762] despite the recognition in NAWAC's 2010 report to the code that the:[763]

> …behavioural repertoire of a pig includes standing, lying in various positions, walking to resources even at times when all other pigs are lying, exploration…and interacting socially including avoidance if attacked.

Pigs have a wide range of behavioural needs, with commentators having identified a number of findings from studies of pig cognition, emotion, and behaviour which suggest that pigs possess complex ethological traits similar, but not identical, to dogs and chimpanzees.[764] Just like dogs and primates, pigs are playful animals and regularly engage in complex social and object play. Studies have shown that pigs shake or carry objects such as balls or sticks, hop, jump or pivot to entertain themselves, and engage in play fighting or chasing.[765] Play has been shown to be important in social affiliation, with play enabling pigs to develop social bonds (e.g. through social nosing)[766] and with pigs reared in enriched environments "more socio-cognitively developed than their counterparts raised in standard farrowing crates (Martin et al., 2014)."[767] As well as satisfying the behavioural need of exploration which is deeply ingrained in pigs, play is also crucial for healthy development, with insufficient opportunity to perform this need resulting in behavioural abnormalities[768] - including tail-biting,[769] re-direction of exploratory behaviours to pen fixtures or pen mates[770] and ear-biting.[771] Morino and Colvin stated:[772]

> …pigs make more optimistic choices (have a positive bias) when in enriched environments than in others, indicating that they find stimulation rewarding and pleasurable (Douglas, Bateson, Walsh, Bedue, & Edwards, 2012). Therefore, opportunities for play and exploration impact emotional development in pigs as well.

760 Code of Welfare (Pigs) 2018, Minimum Standard No. 9 at 16

761 At 16

762 Lawrence, Newberry and Spinka, above n 193 at 432; "exploration, foraging, play, nesting and maternal-offspring interactions [as] largely synonymous with positive welfare..."

763 National Animal Welfare Advisory Committee, above n 130, at 10

764 Lori Morino and Christina Colvin "Thinking Pigs: A Comparative Review of Cognition, Emotion and Personality in *Sus deomsticus*" (2015) 28 Int. J. Comp. Psychol. 1 at 15

765 At 8

766 Lawrence, Newberry and Spinka, above n 193, at 428

767 Morino and Colvin, above n 765, at 8

768 At 8 citing Pedersen et al., 2014; Studnitz et al., 2007; Telkanranta et al., 2014.

769 L.J. Pedersen, M.S. Herskin, B. Forkman, U. Halekoh, K.M. Kristensen, & M.B. Jensen "How much is enough? The amount of straw necessary to satisfy pigs' need to perform exploratory behavior." (2014) 160 Appl. Anim. Behav. Sci. 46.

770 M. Studnitz, M.B. Jensen L.J. Pedersen "Why do pigs root and in what will they root? A review on the exploratory behavior of pigs in relation to environmental enrichment." (2007) 107 Appl. Anim. Behav. Sci. 183.

771 H. Telkanranta, M.B.M. Bracke& A. Valros "Fresh wood reduced tail and ear biting and increases exploratory behavior in finishing pigs." (2014) 161 Appl. Anim. Behav. Sci. 51.

772 Morino and Colvin, above n 765, at 8

Play also indicates a favourable environment "because animals tend to reduce play when they are experiencing challenges and even abolish play when their fitness is under threat."[773]

Rooting and foraging are similarly important behaviours:[774]

> Evidence suggests that the rooting instinct in pigs is distinct from the feeding instinct. Even pigs who were well fed on commercial rations liked to spend about 20% of daylight hours searching for food when kept in a semi-natural enclosure…The provision of rooting material such as straw has been observed to reduce stereotypical behaviour…and can reduce aggressive actions such as tail biting… Preference tests have also shown that pigs prefer pens with straw or other bedding material to concrete pens, for thermal and physical comfort…and for rooting and foraging.

Pigs spend up to 75% of their time engaging in foraging-type behaviours when kept in a semi-natural enclosure – exploring their environment with their snout.[775] The inability to exhibit rooting and foraging behaviours can lead to re-direction of their energies towards other pigs and oral behaviours such as tail-biting and ear-chewing, with such behaviours reduced when substrates such as straw are provided.[776] Similarly, pigs may redirect rooting and foraging behaviour towards pen fittings and may belly-nose other pigs or exhibit aggression towards them when housed in barren environments.[777] Such antagonistic interactions between pigs in barren systems often result in an increased incidence of lameness and skin damage.[778] Research also suggests that barren environments contribute to apathy and chronic stress in pigs, with pigs in such environments exhibiting low levels of activity and experiencing impairment of cognitive function, increased fearfulness and negative maternal behaviour, which can also lead to increased harmful behaviour between offspring.[779]

The code does contain some references to foraging and play. For example, it is a recommended best practice at minimum standard 2 (Feed) that adult and growing pigs should be given enough bulky or high fibre feed to satisfy both hunger and foraging needs.[780] Furthermore, a recommended best practice at minimum standard 9 (Behaviour) is that rooting material such as straw, or other material that can be manipulated, be provided.[781] In its report to the code NAWAC recognised the benefits of providing such material to "increase the physical and thermal comfort of pigs and to enable them to express behaviours such as rooting and exploration."[782] However NAWAC also considered that it is not always possible to provide these due to drainage issues, which was the reason for the reference to rooting material as a recommended best practice at minimum standard 9 (Behaviour), rather than as a minimum standard. In addition to the provision of manipulable material only being recommended rather than required, compliance with the recommended best practice to provide manipulable material such as straw is also in question, with industry having clearly indicated to NAWAC that nesting material for pigs "is not used, and the strong message from industry… was 'don't go there'."[783]

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773 Lawrence, Newberry and Spinka, above n 193 at 425 citing Held and Spinka (2011). "For instance, negative environmental conditions such bad weather; abrupt separation from a sow at weaning; the sound of adult alarm barks; small space accompanied with slatted-flooring and high levels of ammonia concentrations led to less play. In contrast, positive environmental conditions led to greater instances of play – these conditions included straw-bedded farrowing pens or free-farrowing pens and straw-bedded pens after weaning (as opposed to slatted flooring); piglets being able to remain with their mother rather than being fostered; low levels of ammonia and the enrichment of housing with straw, bark and tree branches."

774 Weaver and Morris, above n 693, at 55.

775 D'Eath and Turner, above n 624, at 36 – 37

776 At 36 – 37

777 O'Connell, above n 738, at 197

778 Jeremy N. Marchant-Forde "Welfare of Dry Sows" in *The Welfare of Pigs* (Springer, USA, 2009) at 119

779 O'Connell, above n 738, at 197

780 Code of Welfare (Pigs) 2018, Minimum Standard No. 2, Recommended Best Practice (b)

781 Minimum Standard No. 9, Recommended Best Practice (a)

782 National Animal Welfare Advisory Committee, above n 130, at 11

783 National Animal Welfare Advisory Committee Minute "General Meeting" (17 February 2016) at [O 4]

The code provides as a recommended best practice at minimum standard 9 (Behaviour) the provision of environmental enrichment such as "toys', including a length of hanging chain, rock, tyre, buoy or "foodball".[784] However, no specific mention is made of play and the need to facilitate play behaviours. The potential for such toys to fulfil pigs' instincts to play and explore is also limited. In previous research, we noted that:[785]

> …preference tests have indicated that pigs value indestructible materials like many of those listed above much less than they value straw. They [also] prefer peat, compost, green branches and various wood chips, all of which are valued above straw (Pedersen *et al.*, 2005; Studnitz *et al.*, 2007).

Similarly, it has been observed that over time these toys may lose their capacity to stimulate pigs, with one study suggesting that "in order to be effective, enriching devices should be functionally relevant to the animal"[786] by being, for example, ingestible, odorous, chewable, deformable and destructible.[787] Baxter *et al*. recommended the use of "earth-like materials such as peat, mushroom compost… and more complex materials such as branches",[788] which have been shown to be preferred over straw. Another alternative is the provision of a round bale, as in many Swedish deep-bedded systems "which pigs can distribute themselves over time, and which also serves the dual purpose of forming a visual barrier behind which [pigs] can hide to escape aggression."[789] Baxter *et al*. noted that most "enrichment experiments indicate that it is the novel aspect of the enrichment that stimulates exploratory behaviour"[790], meaning that variety in what is provided may also be necessary.

Wallowing (lying in mud or water) may "play an important social role"[791] for pigs, in addition to providing pigs with a substance with which to remove parasites; to cool efficiently; and to provide protection from the sun. Additionally, the provision of bedding improves the physical comfort of pigs and pigs have been shown to prefer environments with bedding than without.[792] However, the minimum standards do not require pigs to be able to wallow, nor do they require the provision of bedding (although it is encouraged elsewhere in the code).[793]

As previously discussed, adequate space is a fundamental part of pig welfare. Sufficient space also needs to be provided to ensure that the behaviours listed above can be adequately expressed. However, at present there is no requirement in the code or regulations to provide pigs with access to the outdoors – where they might better exhibit behaviours such as exploration, foraging, rooting and play. Naya Brangenberg stated:[794]

> I think that in every system people do the best they can to try and provide some level of enrichment to pigs but I think that it's completely your whole paradigm of how you view pigs. If you pigs as highly

784 Code of Welfare (Pigs) 2018, Minimum Standard No. 9, Recommended Best Practice (g)(i)
785 Knight, above n 584, at 29
786 O'Connell, above n 738, at 197 – 198.
787 At 197 – 198
788 Baxter et al, above n 620, at 592
789 Marchant-Forde, above n 779, at 110
790 Baxter et al, above n 620, at 592
791 Ministry for Primary Industries *Welfare Pulse* (Issue 10, March 2012) at 20 citing 'Wallowing in Pigs', Bracke, M.B.M. (In press). Applied Animal Behaviour Science
792 O'Connell, above n 738, at 197.
793 E.g. Code of Welfare (Pigs) 2018, Example Indicators for Minimum Standard No. 5, "Bedding material is provided to assist pigs to maintain body temperature in cold weather"; Code of Welfare (Pigs) 2018, Example Indicator for Minimum Standard No. 7 (Temperature), "Bedding is provided for piglets in unheated creep areas"; Code of Welfare (Pigs) 2018, Minimum Standard No. 14 (Managing Dry Sows), Recommended Best Practice (a), "Sows should be provided with additional space, a solid floor and bedding during the first days of group formation."
794 Interview with Naya Brangenberg, above n 119

> intelligent, sentient animals then there's absolutely no way you can confine a pig into a pen or a sty or a stall or even a barn…if you appreciate and view pigs as intelligent, you can't see anything other than free-range as acceptable.

Compassion in World Farming similarly considers that "Outdoor systems with huts for shelter and farrowing have the highest welfare potential of all [systems],"[795] as such systems enable pigs to express the full range of their behavioural needs at the same time as providing sufficient shelter.

Finally, SAFE has identified the practice of having pigs in solitary confinement as another issue contrary to their behavioural needs:[796]

> On a factory farm, boars may be kept in solitary confinement. When this is the case, the isolation and lack of mental stimulation in the way they are housed leads to boredom and frustration in these highly social, intelligent animals. Others are kept in pens with other boars. Deprived of stimulation and being so closely confined, boars may become aggressive and fight when housed together.

795 Dr Dale Arey and Phil Brooke "Animal Welfare Aspects of Good Agricultural Practice: pig production" (Compassion in World Farming, 2006) at 31.

796 SAFE "Boars" < https://safe.org.nz/boars>

5.7 WEANING

Minimum standard 15 (Weaning) provides that "Weaning must be managed in a way that avoids undue stress on the sow and piglets and minimises negative impacts on their health and welfare."[797] The example indicator for this standard indicates that age at weaning should be greater than 21 days (three weeks), with recommended best practice being 28 days (four weeks).[798] In contrast, in domestic pigs:[799]

> …the completion of weaning has been variously estimated to occur by 14–17 weeks (Jensen, 1986), 15–19 weeks (Jensen and Recen, 1989) or 8–14 weeks (Newberry and Wood- Gush, 1985).

Weaning piglets too early may lead to distress, including increased vocalisation, increased sitting inactive and changes in physiological stress indicators such as increased cortisol concentrations, increased growth hormone concentrations and increased neutrophil/lymphocyte ratio.[800] Early weaning may also have long-lasting impacts on the central nervous system of piglets, in particular the serotonin system, which may lead to decreased activity and heightened anxiety and fearfulness.[801] Early weaning even at three - four weeks (as compared to six weeks) can lead to a greater incidence of piglets belly-nosing other pigs, a behaviour which has been "hypothesized as being related to suckling motivation and redirected feeding attempts"[802] (although such behaviour can be reduced through facilitating enriched environments for pigs, in particular providing enrichment devices that satisfy nosing behaviour).[803] Where pigs are separated from the dam and the rest of the social group, this may also impact on behavioural development with the piglet being deprived of opportunities for social learning.[804]

In contrast, free-range farmer Naya Brangenberg weans her pigs at 8-10 weeks and stated "We don't have weaner mortalities because our pigs have excellent immune systems."[805]

797 Code of Welfare (Pigs) 2018, Minimum Standard No. 15
798 Code of Welfare (Pigs) 2018 at 23
799 D'Eath and Turner, above n 624, at 34
800 At 33
801 Held et al, above n 687, at 66 - 67
802 Johnson and Marchant-Forde, above n 621, at 170
803 At 170
804 D'Eath and Turner, above n 624, at 34
805 Interview with Naya Brangenberg, above n 119

5.8 ELECTIVE HUSBANDRY PROCEDURES

There are a number of elective husbandry procedures in relation to pigs, which raise animal welfare concerns. These include tail docking; clipping and grinding of pigs' teeth; use of nose rings, clips or wires; identification procedures; tusk trimming of boars; and castration.

5.8.1 TAIL DOCKING

Minimum Standard 16(ba) (Elective Husbandry Procedures) refers to the docking of pigs' tails and states that pigs must be given pain relief at the time of the procedure.[806] This is reiterated in Regulation 52 of the Animal Welfare (Care and Procedures) Regulations 2018.

This practice was established to address pigs biting each other's tails, although the code of welfare recognises that this practice does not address the underlying causes of tail biting[807] – being the intensive environments in which pigs are farmed. As James has observed:[808]

> Other methods of managing tail biting include the provision of straw, more food and additional space. This statement indicates that the underlying cause of tail biting in pigs is the nature of the environment provided. The introduction of a method such as tail docking to reduce biting, rather than address the underlying causes by providing an enriched environment, does not meet the spirit or intent of providing for the behavioural needs of animals as required in the Act, nor appropriately take into account current scientific knowledge.

NAWAC's report to the code did recognise that providing for enrichment in the environment could minimise the incidence of tail biting, and that tail docking "is likely to be acutely painful when performed and docking may also cause long lasting pain due to the formation of neuromas."[809] However, there is no provision in the code of welfare that requires or recommends the use of environmental enrichment as an alternative to tail docking.

Commentators have also stated that it would be preferable to restrict tail docking to day-old piglets, given they have not fully developed the capacity to feel pain in the same way as older pigs.[810]

5.8.2 CLIPPING AND GRINDING TEETH

Minimum standard 16(c) (Elective Husbandry Procedures) allows farmers to clip or grind the front teeth of pigs under the age of five days without pain relief.[811]

NAWAC has claimed that it is necessary to grind or clip needle teeth in piglets to prevent laceration of the sows' udder and damage to litter mates.[812] However, Gillian Coumbe QC has argued that such procedures are only necessary because of the "cramped conditions in which the animals live,"[813] causing piglets to act out in this way. NAWAC has conceded that there is "debate about the necessity of teeth clipping in

806 Code of Welfare (Pigs) 2018, Minimum Standard No. 16 (ba)
807 At 25
808 Vanessa James, above n 462, at 22
809 National Animal Welfare Advisory Committee, above n 130, at 34
810 Held et al, above n 687, at 50 – 51
811 Code of Welfare (Pigs) 2018, Minimum Standard No. 16(c)
812 At 25
813 Coumbe, above n 441, at 2

outdoor systems",[814] and that because pigs housed outdoors are not as used to humans, performing this procedure could lead to a disruption in maternal behaviour "which could have more serious consequences than leaving teeth unclipped."[815] NAWAC also discussed research which found that grinding teeth causes less tooth cracking than clipping, but it refrained from requiring teeth to be ground rather than clipped, unless they are needle teeth, and even then, only as a recommended best practice.[816] The code also makes no reference to how teeth clipping in outdoor systems should be approached, or the use of environmental enrichment to prevent the need for teeth clipping.

5.8.3 USE OF NOSE RINGS AND CLIPS

The code currently allows for the use of nose rings and clips.[817] This is to reduce damage to pasture, as the "rings make it painful for the pigs to press their snout against the ground, in addition to preventing pigs rooting and finding food."[818]

NAWAC recognised in its report on the pigs code of welfare, that the "act of fixing the rings will also cause significant pain to the pigs."[819] Such practices are particularly problematic because, as Lori and Colvin explained:[820]

> The highest density of tactile receptors is found in the pig's snout (Kruska, 1988), as they use their snouts to engage in highly manipulative behaviours such as rooting, carrying and pushing, and social interactions (Stolba & Wood- Gush, 1989).

Despite this, there is currently no requirement in the code to give pigs pain relief while fixing nose rings and clips. The code provides only that they must be placed "through the cartilage at the top of the snout or in the tissue separating the nostrils"[821] and "not at the bottom of the snout where they would cause additional discomfort for the pig as it pushes its snout against the ground."[822] Organisations such as SAFE are critical of this practice as it prevents pigs from rooting, which is an important natural behaviour.[823]

The use of nose wires are set to be banned come 9 May 2021 as a result of new regulations in relation to surgical procedures on animals.[824] The use of clips and rings will also be prohibited – except that they will be allowed where it is necessary for "animal management purposes."[825] Unfortunately, the regulations do not define what this means. It appears the use of clips and rings so as to prevent pigs from pressing their snout against the ground will still be allowed, thus preventing pigs from expressing their normal behaviours of rooting and foraging.

814 National Animal Welfare Advisory Committee, above n 130, at 33
815 At 33
816 At 34
817 Code of Welfare (Pigs) 2018, Minimum Standard No. 16(d)
818 National Animal Welfare Advisory Committee, above n 130, at 35
819 At 35
820 Morino and Colvin, above n 765, at 2
821 Code of Welfare (Pigs) 2018, Minimum Standard No. 16(d)
822 National Animal Welfare Advisory Committee, above n 130, at 35
823 SAFE "Free range pigs" < https://www.safe.org.nz/free-range-pigs>
824 Animal Welfare (Care and Procedures) Amendment Regulations 2020, regulation 58E(1). The Code of Welfare (Pigs) 2018 will be amended with a new Minimum Standard No. 16(g) prohibiting the use of nose wires.
825 Regulation 58E(3). The Code of Welfare (Pigs) 2018 will be amended with a new Minimum Standard No. 16(h) prohibiting the use of nose rings or clips except for "animal management purposes."

5.8.4 IDENTIFICATION PROCEDURES

The code provides that where it is "necessary for permanent identification, the ears may be notched, tagged, punched or tattooed. Alternatively, the body may be tattooed, or an electronic identification system used."[826] There is no requirement that pain relief be administered before undertaking these procedures.

5.8.5 TUSK TRIMMING

Tusk trimming in boars may be an additional issue, this practice being permitted under the code of welfare.[827] Fulbini and Ducharme recommend taking care when performing this procedure because the pulp cavity of the tusk may extend to *or above* the level of the gums and when the tusk is cut too short, the pulp can be exposed, leading to painful pulpitis and potential apical infection.[828] Bovey *et al.* found that the pulp chamber in boars was exposed approximately 50% of the time and almost half of the 102 tusks examined had moderate to severe gum inflammation.[829]

This occurred where tusks were trimmed within 2 mm of the gums (per the current industry practice in Canada). The code recommends that "tusks should be severed above the level of the gums without causing damage to other tissues,"[830] however it does not specify that this should be 2 mm above the gum line as this overseas study suggests.

5.8.6 CASTRATION

Regulation 55 manages the castration of pigs.[831] The regulation provides that pigs must be given pain relief at the time of this procedure. However, other countries referenced by NAWAC in their report only allow castration on pigs two to seven days old (e.g. Denmark).[832] MPI has also referred to a study, which found that nitrous oxide may reduce the pain of castration in piglets, with piglets displaying less huddling behaviour and more tail-wagging than control piglets (potentially indicating a reduction in pain post-surgery).[833] The use nitrous oxide in relation to this procedure could be investigated further.

826 Code of Welfare (Pigs) 2018 at 25
827 Minimum Standard No. 16, Recommended Best Practice (g)
828 Susan L. Fubini, Norm G. Ducharme *Farm Animal Surgery* (2nd edn, Elsevier Inc, Missouri, 2019) at 137.
829 Bovey K, Lawlis P, DeLay J, Widowski T. Department of Animal and Poultry Science. University of Guelph; Ontario, Canada: 2008. Innervation and condition of mature boar tusks at slaughter
830 Code of Welfare (Pigs) 2018, Minimum Standard No. 16, Recommended Best Practice (g)
831 Animal Welfare (Care and Procedures) Regulations 2018, regulation 55
832 National Animal Welfare Advisory Committee, above n 130, at 33
833 Rault, J.L and Lay, D.C. "Nitrous Oxide by Itself Is Insufficient to Relieve Pain Due to Castration in Piglets" (2011) 89 J Anim Sci 3318, cited in Ministry for Primary Industries, above n 792, at 20

5.9 USE OF ELECTRIC PRODDERS AND GOADS

Regulation 48 of the Animal Welfare (Care and Procedures) Regulations 2018 currently permits the use of an electric prodder on pigs that weigh over 150 kg during loading or unloading for transport and during loading of a stunning pen at any slaughter premises.[834] Since 27 August 2020,[835] the use of electric prodders have also been permitted on pigs that weigh over 70 kg during "loading of a stunning pen at any slaughter premises if the pigs are in a single-file slaughter race leading into, and within 15 m of, the stunning pen during loading."[836]

The regulation allows that the prodder may be used only on the muscled areas of the animal's hindquarters or forequarters and requires that the animal must have sufficient room to move away from the prodder.[837]

The use of such instruments may not be appropriate as they can cause acute stress and pain in pigs. Faucitano *et al*. refer to numerous studies showing that the use of electric prodders provokes a negative physiological and behavioural response in pigs:[838]

> …in terms of higher incidence of backing-up, round turns, slipping, falling, jumping, jamming and high-pitched vocalisations…and greater heart rates and blood cortisol and lactate concentrations.

The authors referred to an additional study stating that electric prodding should not be used more than twice and for less than 1 second each on a pig during handling.[839] The Humane Slaughter Association (2016) similarly recommends that electric prodders should be applied for a maximum of one second; that multiple applications should be adequately spaced; and that shocks must not be used repeatedly if the animal fails to respond.[840]

Such limitations are not incorporated into regulation 48 or the code of welfare. In contrast, the Code of Welfare (Dairy Cattle) 2019 includes as a recommended best practice that electric prodders should not be applied for more than one second at any one time and if the desired effect is not achieved after four or five attempts, its use should be discontinued.[841] The regulation and/or the code should be amended to include this as a mandatory limitation.

Regulation 49 further provides that a person must not "strike or prod an animal with a goad in the udder, anus, genitals or eyes."[842] This regulation applies to goads used to make an animal move, but does not include an electric prodder. Grandin also recommended against the use of such prodders on the ears and nose,[843] however prodding these sensitive areas is not prohibited under regulation 49 or elsewhere.

834 Animal Welfare (Care and Procedures) Regulations 2018, regulations 48(1)(b) and (c)
835 Regulation 2(a)
836 Animal Welfare (Care and Procedures) Amendment Regulations 2020, regulation 10 and Code of Welfare (Commercial Slaughter) 2018, Minimum Standard No. 4(ta)(iv)
837 Animal Welfare (Care and Procedures) Regulations 2018, regulations 48(2)(a) and (b).
838 Luigi Faucitano and Se´bastien Goumon "Transport of pigs to slaughter and associated handling" in Maria Spinka (ed) *Advances in Pig Welfare* (Elsevier, UK, 2018) 268.
839 At 268
840 Humane Slaughter Association, above n 503
841 Code of Welfare (Dairy Cattle) 2019, Minimum Standard No 10 (Stock Handling), Recommended Best Practice (d)
842 Animal Welfare (Care and Procedures) Regulations 2018, regulation 49
843 Grandin, above n 504

5.10 VENTILATION

The standard for air quality provided by minimum standard 8(b) (Air Quality) allows relatively high levels of ammonia at 25 ppm.[844]

M Parker *et al*. found that atmospheric ammonia at 20 ppm led to pigs being more aggressive in the early stages of exposure to treatment conditions, as ammonia interfered with social interactions due to the "disrupted transmission of olfactory… cues."[845] In this way excessive ammonia levels can be particularly problematic because, as Morino and Colvin observed:[846]

> Olfaction is the pig's keenest sense. Thus, they learn olfactory discriminations more easily than discriminations in other modalities (Croney, 1999). As opportunistic omnivores, they rely heavily on odors and flavors to find appropriate food items when foraging (Croney, Adams, Washington, & Stricklin, 2003). Furthermore, their sensitivity in the olfactory domain is not limited to foraging for food, but is used heavily in the social domain in a wide range of contexts, including discriminating social identity (Mendl, Randle, & Pope, 2002, sexual state (Signoret, Baldwin, Fraser, & Hafez, 1975) and the emotional state of other pigs in aggressive encounters (McGlone, 1990), as well as in creating dominance hierarchies (Mendl, Randle, & Pope, 2002).

M Parker *et al*. reported that pigs from ammoniated rooms "had lower salivary cortisol and larger adrenal glands than pigs from non-ammoniated rooms, suggesting a generalised stress response to 20 ppm ammonia."[847] Further:[848]

> …pigs kept in ~20 ppm ammonia were initially less playful (non-social) than in lower concentrations, suggesting a depression in energetic activities indicative of stress or possibly a shift in energetic behavioural activity away from play to aggression.

Jones *et al*. found that when given the choice, pigs prefer areas with fresh air or low levels of ammonia (e.g. 10 ppm) as compared to areas with 20 ppm or 40 ppm. Pigs in this study spent significantly more time sitting, foraging, feeding and standing in low ammonia environments.[849] Richardson recommended that ammonia in the environment be less than 10 ppm, in part because ammonia at 20 ppm "can damage the bacteria-catching cilia in the windpipe of a pig. This increases the risk of infection, as bacteria-laden dust particles are not filtered out."[850]

NAWAC acknowledged in 2015 that an ammonia level of 25ppm is too high "and should be brought into line with other codes and current science down to 15-20ppm."[851] However, it noted this "requires re-negotiation with industry."[852] No such changes have thus far been affected.

844 Code of Welfare (Pigs) 2018, Minimum Standard No. 8(b) at 15

845 M.O. Parker, E.A. O'Connor, M.A. McLeman, T.G. Demmers, J.C. Lowe, R.C. Owen, E.L. Davey, C.M. Wathes, S.M. Abeyesinghe "The impact of chronic environmental stressors on growing pigs, Sus scrofa (Part 2): social behaviour" (2010) 4:11 Animal 1910 at 1910 - 1911

846 Morino and Colvin, above n 765, at 2 – 3.

847 Parker et al, above n 846, at 1919

848 At 1919

849 J Jones, L Burgess, A Webster and C Wathes, "Behavioural responses of pigs to atmospheric ammonia in a chronic choice test" (1996) 63 British Society of Animal Science 437-445; Jones JB, Wathes CM and Webster AJF "Operant responses of pigs to atmospheric ammonia" (1998) 58 Appl. Anim. Behav. Sci. 35 and Wathes CM, Jones JB, Kristensen HH, Jones EKM and Webster AJF "Aversion of pigs and domestic fowl to atmospheric ammonia" (2002) 45 Transactions of the Asabe 1605.

850 John Richardson "In pursuit of growth... some tips to help you" (2001) 2 *Pig Farming*

851 National Animal Welfare Advisory Committee, above n 523, at 8 (Obtained under Official Information Act 1982 Request to MPI).

852 At 8

5.11 LIGHTING

Minimum standard 6(f) (Housing and Equipment) allows pigs to be kept in total darkness for 15 hours a day, with a low artificial light of only 20 lux being required for the other 9 hours of the day.[853] This is in contrast to the EU, where minimum illumination levels in pig facilities are required to be 40 lux during the light period.[854]

A study by Zonderland *et al*. found that pigs rely primarily on olfactory and auditory cues, with increased illumination level having little impact on pigs' ability to identify visual cues as compared to object size.[855] Similarly, Taylor *et al*. found that an illuminance of 40 lux is "neither aversive nor strongly preferred by the pigs."[856] However, M Parker *et al*. found that pigs kept in rooms with low light levels of 40 lux did show "higher incidences of aggression in the early stages of exposure to the treatment conditions,"[857] postulating that this was because pigs were less able to discriminate visually between familiar and unfamiliar pigs.

There are also questions around how the standards relating to ammonia and lighting levels are enforced. As Naya Brangenberg stated, "Unless that farm has an ammonia metre, how are they enforcing that? Same thing with lux – who is actually out there measuring lux?"[858]

There are no minimum standards or recommended best practice regarding the provision of natural light for pigs. Alexander *et al*. found that 1 hour of sun exposure a day increases vitamin D sufficiency in growing pigs.[859] Providing natural light to pigs should therefore be considered as at least a recommended practice.

853 Coumbe, above n 441, at 2

854 Directive 2008/120/EC – minimum standards for the protection of pigs [2008] OJ L 47

855 J Zonderland, L Cornelissen, M Wolthuis-Fillerup, H Spoolder "Visual acuity of pigs at different light intensities" (2008) 111 Appl. Anim. Behav. Sci .28

856 Taylor, Nina & Prescott, Neville & Perry, Graham & Potter, Martin & Sueur, Caroline & Wathes, Christopher "Preference of growing pigs for illuminance" (2005) 96 Appl. Anim. Behav. Sci. at 19.

857 Parker et al, above n 846, at 1910

858 Interview with Naya Brangenberg, above n 119

859 BM Alexander, BC Ingold, JL Young, FR Fernsterseifer, PJ Wechsler, KJ Austin, DE Larson-Meyer "Sunlight exposure increases vitamin D sufficiency in growing pigs fed a diet formulated to exceed requirements" (2017) 59 Domest. Anim. Endocrinol. 37 at 37

5.12 MIXING OF PIGS

The Code of Welfare (Pigs) 2018 recognises, "Mixing of sows can result in fighting as the sows establish a hierarchy."[860] Similarly, "Pigs are hierarchical animals and will seek to establish a social structure which may result in aggression, particularly when mixing unfamiliar pigs."[861]

The code provides as a recommended best practice that "Every effort should be made to minimise mixing of unfamiliar pigs";[862] that mixing of unacquainted boars should not occur;[863] that "mixing of unfamiliar pigs on the transport vehicle should be avoided";[864] and that inspections should increase when mixing of pigs has occurred.[865] The general information section to minimum standard 9 (Behaviour) identifies further techniques to minimise aggression when mixing unfamiliar pigs.[866]

Mixing unfamiliar pigs can be highly problematic, resulting in serious fighting that can be exhausting, stressful, and result in physical injury. This is particularly so where there is prolonged chasing and bullying of a pig if it has nowhere to hide.[867] The stress induced from such mixing can result in a negative impact on maternal behaviour, with gilts born to sows that were mixed during pregnancy expressing:[868]

> …more abnormal behaviours compared to daughters of control non-stressed sows (Jarvis et al., 2006). These daughters of stressed sows were more restless at parturition, more reactive to their piglets, and exhibited a greater tendency towards biting at their piglets compared to the daughters of control sows.

However, none of the provisions in the code of welfare are mandatory minimum standards and this is problematic in light of how stressful mixing can be for pigs.

There are also a number of other factors that can reduce aggression during mixing, including increased space; the provision of enriching devices; the use of barriers; and socialising pigs prior to regrouping at weaning.[869] However, no alternative approaches are addressed in the code.

860 Code of Welfare (Pigs) 2018 at 19

861 At 16

862 Minimum Standard No 9 (Behaviour), Recommended Best Practice (f)

863 Minimum Standard No 12, Recommended Best Practice (b)

864 Minimum Standard No 17, Recommended Best Practice (c)

865 Minimum Standard No 18, Recommended Best Practice (a)

866 Minimum Standard No 9 (Behaviour), 'General Information'. Including introducing pigs into a pen that has feed on the floor; introducing all pigs into a new pen at the same time; using group sizes of more than 50 pigs and using a pen with room for pigs to move away or where baffles such as bales of straw are provided behind which they can hide.

867 D'Eath and Turner, above n 624, at 37

868 Chidgey et al, above n 629, at 51 citing S. Jarvis, C. Moinard , S.K. Robson, E. Baxter, E. Ormandy, A.J. Douglas, J.R. Seckl, J.A. Russell, A.B. Lawrence"Programming the offspring of the pig by prenatal social stress: neuroendocrine activity and behaviour" (2006) 49 Horm. Behav 68.

869 These include increased space; the provision of enriching devices such as toys; the inclusion of barriers behind which pigs can hide and socialising pigs prior to regrouping at weaning, O'Connell, above n 738, at 201; As well as mixing piglets prior to weaning and repeated mixing; pre-mixing (i.e. allowing new sows to meet each other first and to establish a hierarchy before introducing the new sows to the larger group); and pre-exposing pigs to each other (e.g. placing new sows within a small pen in a larger pen), Marchant-Forde, above n 779, at 114; Studies have also shown that if piglets are mixed during lactation, their welfare is improved at weaning with "reduced aggression compared to previously unmixed control piglets and better post-weaning growth rates… [as well as] fewer skin lesions on co-mingled pigs… improved social skills [and improved weight gain]", Johnson and Marchant-Forde, above n 621, at 168

5.13 GENETIC SELECTION

Minimum standard 9 – recommended best practice (c) advises that genetic selection "should be encouraged as a means to promote behavioural traits that minimise welfare problems in pigs."[870] However, no guidance is provided as to how this might be achieved. Additionally, while the code of welfare recognises that pigs are "genetically bred for fast lean growth rates",[871] there is little guidance in the code on the use of genetic selection for maximal productivity (e.g. high body weights, feed conversion rations, and litter sizes) and the consequent welfare impacts of this on pigs and piglets.

Genetic selection has typically focused on high productivity, leading to "litters of 12-13 piglets in sows that weigh a staggering 260 kg on average (Calderón *et al.*, 2014), and in some cases, considerably more."[872] The NAWAC report on the code considered the potential implications of this, including the need to provide for different levels of feeding to account for accelerated growth:[873]

> Rauw et al. (1998) argued that domesticated animals have been bred to be hungry – selection for faster growth and larger animals perhaps altering, even damaging, the brain's satiety mechanisms leading to a failure to diminish the hunger drive. Hunger and biological performance and optimal sow welfare may therefore require different levels of feeding.

NAWAC has observed that rapid weight gain as a result of selective breeding for high productivity "can result in leg weakness."[874] And in 2014, NAWAC noted, "bigger pigs are being bred that are kept in crates built a long time ago that are now too small."[875]

Hans Kriek of SAFE stated that breeding pigs to become much larger animals leads to mother pigs that:[876]

> …are clumsier and overlay on their piglets more. And because we have more piglets per sow, that means there will be more runty ones in there. So, if you have six piglets, they can all be robust and strong and get away from the mother when she tries to lie down. If you've got 13, there may be two or three that will be on the weaker side, and they won't get away from mum.

NAWAC has also recognised the welfare issues associated with selective breeding for high productivity and its impacts on piglet survivability:[877]

> Selective breeding has a major part to play. Litter size is a major factor in survivability. Piglet size is going up at 1.5 piglets per year, and teat number by only 1⁄4 per year. Further, more piglets means more frail piglets. The industry is against change in regards to genetics which are controlled by breeding companies based overseas, but if NZ industry never says anything, how will it change? The genetic manipulation is an ethical issue that is creating a welfare problem.

Conversely, pigs may be genetically selected so as to improve their welfare. In its 2016 report on farrowing, NAWAC identified genetic selection as a means of reducing the need for farrowing crates and stated that the industry should work to maximise piglet survival through breeding for non-crushing sows (who spend more time making nose-to-nose contact with their piglets before lying down and react

870 Code of Welfare (Pigs) 2018, Minimum Standard No.9, Recommended Best Practice (c)
871 Code of Welfare (Pigs) 2018 at 9
872 Knight, above n 584, at 2
873 National Animal Welfare Advisory Committee, above n 130, at 6
874 National Animal Welfare Advisory Committee, above n 121, at 13
875 National Animal Welfare Advisory Committee Minute "General Meeting" (05 November 2014) at [C 3]
876 Interview with Hans Kriek, above n 15
877 National Animal Welfare Advisory Committee Minute "General Meeting" (5 August 2015) at [C 6]

more quickly to piglet distress calls); breeding for good physiological sows (optimal uterine environment, maternal behaviour, lactational output); and breeding more robust piglets that are less susceptible to being crushed.[878] Finally, NAWAC's report to the Code of Welfare (Pigs) 2010 recognised that genetically selecting sows that are adaptable to the farrowing crate environment may have an impact on maternal behaviour:[879]

> When housing sows in crates, maternal behaviour may have been negatively selected for in favour of other attributes that would make them more suitable to the crate environment (Gustafsson et al., 1999). Thus, such sows, which respond less negatively to restraint when housed in crates, may be less suitable for activities that would promote the survival of piglets in a group environment (Wechsler and Hegglin, 1997).

However, none of these issues are addressed in the code of welfare or regulations and it is uncertain whether and to what extent the industry has heeded NAWAC's advice.

878 National Animal Welfare Advisory Committee, above n 212, at 4
879 National Animal Welfare Advisory Committee, above n 130, at 15

“NAWAC HAS CONCERNS ABOUT THE WELFARE IMPLICATIONS OF THE RAPIDITY OF CHICKEN GROWTH THAT ENABLES HARVESTING AT ABOUT FIVE WEEKS OF AGE AND RISKS CREATING CHICKENS THAT MAY SPEND PART OF THEIR SHORT LIVES IN DISTRESS FROM LAMENESS.”

NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE (NAWAC)

CHAPTER 6 - CODE OF WELFARE (MEAT CHICKENS) 2018

6.1 OVERVIEW

There are currently 180 poultry farms in New Zealand producing meat chickens for consumption.[880] As of 2017, these farms housed approximately 125 million birds, making the meat chicken industry the largest terrestrial animal industry[881] and chicken the most consumed meat in New Zealand.[882] Approximately 80% of these chickens are raised in barns, with the remaining 20% being "free-range."[883] However, as discussed at section 1.2.3, there is huge variety in what "free-range" actually means in relation to meat chickens, there being no legal definition or standard to clarify this.[884]

Given the extent of meat chickens consumed in New Zealand, it is imperative that the welfare issues associated with raising these animals be adequately canvassed in the Code of Welfare (Meat Chickens) 2018 and through relevant regulations. We analysed the code through conducting a peer review of the research that would have been available to NAWAC when it first reviewed the code in 2011; by reviewing the literature that has subsequently become available since 2011; by reviewing literature relevant to the 2018 amendments to the code; and by reviewing NAWAC's 2011 report on the Code of Welfare (Meat Chickens).[885] We found that these animals remain vulnerable in numerous respects:

- **Selective Breeding for High Growth Rates:** This issue has to be addressed, in light of the numerous health impacts this practice has on meat chickens, (including lameness, heart problems, ascites, sudden death syndrome, leg disorders, metabolic disease and skeletal disorders), as well as the impact this has on meat chickens' ability to perform their normal behaviours (including walking, pecking, scratching and perching). MPI and NAWAC have acknowledged on multiple occasions that this issue continues to persist in meat chickens farmed in New Zealand. Thus, the code of welfare and/or regulations have to be amended to adequately ameliorate the welfare impacts of this practice.
- **Stocking density**: Stocking density needs to be reduced. At present, meat chickens can be kept at a maximum of 38 kg of live weight per m^2 (equating to approximately 15 birds per m^2 when birds are at their heaviest). Intensive confinement such as this impacts on chickens' ability to express their normal behaviours, such as locomotion and exploration, and leads to health issues such as contact dermatitis; the irritation of eyes and respiratory systems; an increased incidence of lameness; and an increased incidence of necrotic enteritis. NAWAC did not take into account all the available science when reaching its decision to permit such a stocking density, looking instead to international standards. As a result, the current standard in the code of welfare appears inconsistent with the requirement to meet the physical, health and behavioural needs of meat chickens and must be amended.

880 Poultry Industry Association New Zealand "NZ Chicken" <https://www.pianz.org.nz/nz-chicken/>

881 National Animal Welfare Advisory Committee, above n 121, at 16

882 Poultry Industry Association New Zealand "Chicken defies meat consumption trends" (12 February 2018) <https://www.pianz.org.nz/news/chicken-defies-meat-consumption-trends/>. As the PIANZ website states, "In 2006, New Zealanders ate 32kg of chicken, 16kg of pork, 17kg of beef and veal and 19kg of lamb and mutton. In 2016, they tucked into about 40kg of chicken each, 18kg of pork, 10kg of beef and veal, and just 1kg of lamb and mutton."

883 Email from Michael Brooks of PIANZ to the author, 20 April 2020.

884 As stated at chapter one, it is suspected that meat labelled 'free-range' in New Zealand does not meet many consumers' expectations of what amounts to free-range. In its latest survey, Consumer New Zealand found that consumers expected 'free-range' in relation to meat chickens to mean that the chickens spend the bulk of their time outdoors in small flocks of 500 – 1500 hens (this flock size is significant as it impacts on the number of chickens who are able to navigate their way to openings in the shelter so as to access the outdoors. In reality however, the majority of free-range eggs come from flocks of at least 4000, with 'free-range' meat chickens being raised in flocks as large as 36,000 hens. Consumer, above n 66

885 National Animal Welfare Advisory Committee *Animal Welfare (Meat Chickens) Code of Welfare Report* (12 October 2011)

- **Meat Chickens' Behavioural Needs:** The behavioural needs of meat chickens generally are not adequately protected by the code of welfare, which does not include reference to behaviours such as jumping, flying, roosting, exploration, dust bathing, perching, foraging and running. Access to these behaviours should be required in the code of welfare and/or a regulation, along with access to novel stimuli so as to facilitate exploratory and foraging behaviours. This issue is compounded by the fact that farmers are not required to provide chickens with access to the outdoors, although this would enable them to express a greater range of behaviours and would lead to decreased stress, increased exercise and better overall health. And even where chickens *are* provided with such access, the code may not adequately ensure that sufficient shelter is provided so that meat chickens actually use the outdoor range. Such shelter is necessary as meat chickens have a natural fear of predation and will not roam in the outdoors unless adequate shelter is provided.
- **Provisions Relating to Contingency Planning:** In West Auckland in 2018 50,000 chickens burned to death due to a fire outbreak, and in Helensville in 2019 a staggering 190,000 chickens suffocated to death as a result of a power cut and generator failure. These incidents demonstrate how vulnerable meat chickens are where automated systems fail and necessitate amendments to the code and/or regulations to prevent the use of interconnected housing in which fires can spread more easily; to require farmers to check on birds multiple times a day; and to require that all alarms, fire fighting equipment and emergency power supplies be tested regularly and test results documented.
- **Temperature and Ventilation:** There are concerns associated with temperature and ventilation in regards to meat chickens. These include brooder areas for chicks not being at an optimum temperature so as to guarantee their health and welfare; high stocking densities leading to potential heat exhaustion; and permitted ammonia levels that scientific evidence has proven to be deleterious to meat chickens. It is also not a requirement of the code or regulations that ammonia levels be measured and monitored by farmers.[886]
- **Catching:** Catching techniques for meat chickens are in need of improvement. Currently, four chickens can be caught in each hand of a catcher at any one time and held in an inverted position. This method leads to heightened stress and fear in meat chickens and subsequent studies since NAWAC's report on the code have revealed alternative methods are preferable in order to ensure a higher standard of animal welfare, such as holding birds under the abdomen in an upright position; putting birds into crates gently and one at a time; and/or utilising mechanical catching.
- **Lighting:** At present, meat chickens are not provided with sufficient periods of darkness in a 24-hour period to ensure their welfare. Currently, the code only requires that they be provided with a minimum of four hours of continuous darkness, or three hours of continuous darkness where more than four hours are provided in a 24-hour period. Research has shown that a longer duration of darkness reduces bird mortality; leads to improvements in leg strength; reduces pain; increases bird mobility; and leads to more time spent eating and expressing comfort behaviours. While NAWAC recognised research in its report showing that seven hours of continuous darkness is the optimum period of darkness for meat chicken welfare, it did not include this as a requirement in the code. The code of welfare and/or regulations should be amended to ensure that meat chickens have access to at least seven hours of continuous darkness per day; this period should be continuous and not able to be partitioned into smaller periods; the darkness that is required should be adequately defined in the code; lighting should be gradually raised and lowered at dawn and dusk; and the minimum standard permitting a training period of four days with continuous lighting for 23 hours a day should be reviewed. The lux level required during daylight hours is also in need of review, in light of the latest scientific literature showing that 20 – 50 lux may not be sufficient to meet the physical, health and behavioural needs of meat chickens.

886 This is merely included as an example indicator to the minimum standard, meaning that it is evidence of the minimum standards having been complied but with but is not mandatory in and of itself. Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 7 (Ventilation) Example Indicator

- **Litter Management:** The provisions relating to litter need to be amended so as to ensure they are adequate. At present, there are a wide range of measures not currently included in the code that could contribute to better quality litter and a reduced incidence of contact dermatitis. A cleanliness score should be developed so as to ensure the condition of litter is adequate to provide for the needs of meat chickens. Other factors affecting hock, foot and breast burn should also be acknowledged in the code.[887]
- **A Code of Welfare for Meat Chicken Breeder Birds:** A code of welfare for meat chicken breeder birds has to be developed, as the code of welfare for meat chickens does not apply to such birds and there are clearly pressing welfare concerns associated with how these birds are raised. These include selection pressures for fast growing birds leading to issues with obesity; difficulty mating; aggression; high mortality rates; locomotory problems; and an inability to reach sexual maturity. The use of starvation to ameliorate these welfare issues is associated with its own welfare problems, with birds being hungry, frustrated and stressed where such practices are used. NAWAC has proposed to develop such a code in the near future. This code will have to address these welfare issues.
- **Reducing Mortality Rates:** There may be scope for reducing mortality rates in relation to meat chickens via amendments to the code of welfare and/or regulations, including having lower stocking densities; addressing issues associated with temperature, ventilation and contingency planning; the implementation of less stressful catching techniques; providing chickens with access to the outdoors; providing for the behavioural needs of meat chickens; and through avoiding the use of fast growing breeds.

The Animal Welfare (Care and Procedures) Regulations 2018 do not include any regulations relating to meat chickens and do not make any of the minimum standards in the Code of Welfare (Meat Chickens) 2018 enforceable. NAWAC has stated that it has begun scoping work on regulations. Arnja Dale, Chief Scientific Officer for the RNZSPCA and NAWAC committee member has stated that such regulations "could add teeth to the current welfare code".[888] NAWAC has also announced that the Code of Welfare (Meat Chickens) 2018 will be reviewed.[889] These new regulations and standards are to be considered in 2019 – 2021, as outlined in NAWAC's work programme.[890]

887 Including feed composition; house temperature and relative humidity; floor permeability; and stocking density.

888 Catherine Harris and Tom Pullar-Strecker "SPCA says chicken farm regulations being scoped, as Tegel is investigated" *Stuff* (online ed, New Zealand, 2 August 2018)

889 Interview with Michael Brooks, above n 19. *National Animal Welfare Advisory Committee Annual Report* 1 January to 31 December 2018 (Ministry for Primary Industries, October 2019): and National Animal Welfare Advisory Committee, above n 542

890 National Animal Welfare Advisory Committee, above n 542, at 1

6.2 SELECTIVE BREEDING AND HIGH GROWTH RATES

In the 'General Information' section of minimum standard 11 (Providing for Behavioural Needs), NAWAC identified concerns about the welfare implications of high growth rates:[891]

> NAWAC has concerns about the welfare implications of trends in this industry, particularly in relation to rapid growth rates. Fully-housed production systems risk producing birds that are unable to develop and display normal behaviours. The industry needs to take steps to ensure these trends do not create future welfare problems that will be ethically unacceptable to New Zealanders.

Similarly, the code states in the 'General Information' section of minimum standard 14 (Management of Health and Injury):[892]

> NAWAC has concerns about the welfare implications of the rapidity of chicken growth that enables harvesting at about five weeks of age and risks creating chickens that may spend part of their short lives in distress from lameness.

Despite NAWAC's recognition that selective breeding for high growth rates can lead to lameness and an inability to develop and display normal behaviours, there are no minimum standards regarding selective breeding in the Code of Welfare (Meat Chickens) 2018. There is only a recommended best practice at minimum standard 14 (Management of Health and Injury), which provides that "Genetic selection methods should be encouraged as a means to promote traits that minimise welfare problems in meat chickens."[893]

Rapid growth rates as a result of selective breeding leads to a range of welfare issues for meat chickens, with these chickens reaching their slaughter weight of about 2 – 2.5kg at about 5-6 weeks of age.[894] The issue applies not only to intensively farmed meat chickens, but to free-range meat chickens as well, which are "still the same genotype."[895] Commentators have noted that this rate of growth is a significant departure from how birds were raised historically, with traditional meat chickens taking around 12 weeks to reach their slaughter weight of about 2 kilograms.[896]

Selection for rapid growth rates not only predisposes meat chickens to lameness, but also to heart problems, ascites, sudden death syndrome and leg disorders. Robins and Phillips stated:[897]

> Fast growing chickens, with increased heart abnormalities, tendon degeneration, scoliosis and rotated tibia, spend more time sitting on the floor and less time on perches, walking and scratching, compared with slow growing chickens…

Kalmar *et al*. found that the intense selection of broiler chickens for fast growth and high meat yield leads to a higher incidence of mortality and metabolic disease, including broiler ascites.[898] Singh *et al*. confirmed the link between fast growth rates leading to a higher incidence of ascites syndrome, in contrast with

891 Code of Welfare (Meat Chickens) 2018 at 17
892 At 21
893 Minimum Standard No. 14, Recommended Best Practice (b)
894 Hutching, above n 21; and SAFE "Chickens bred for meat" <https://safe.org.nz/our-work/animals-in-need/chickens-bred-for-meat/>
895 Interview with Hans Kriek, above n 15
896 Hutching, above n 21; and Compassion in World Farming "The Life of: Broiler Chickens" (Farm Animal Welfare Compendium, 16 December 2019) at 2
897 A. Robins and C.J.C Phillips "International Approaches to the Welfare of Meat Chickens" (2011) 67 World's Poultry Science Association 351 at 355
898 Kalmar et al "Broiler ascites syndrome: Collateral damage from efficient feed to meat conversion" (2013) 121 TVJL 169

broilers having slower growth rates. The authors recommended that:[899]

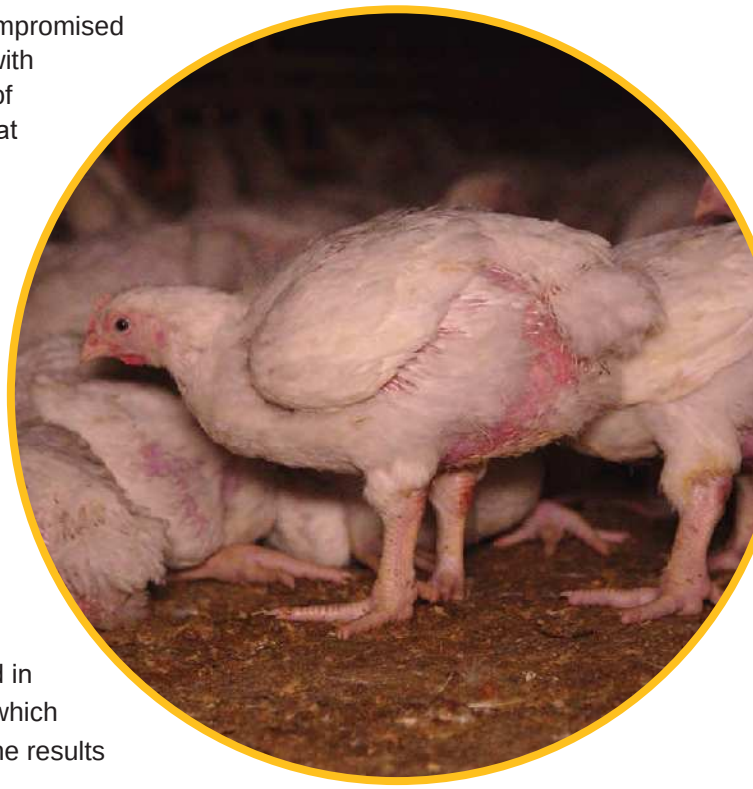
> Breeding objectives should aim at locating and eradicating all the [ascites syndrome] susceptible individuals in the selected population and selecting for high growth rate among the [ascites syndrome] resistant ones.

Similarly, Morris has stated:[900]

> Slow growing strains reared in the same conditions as conventional breeds…showed more active behaviour, fewer heart abnormalities, less tendon degeneration (Bokkers 2003); lower mortality, lower culling rate and fewer ascites [cases] (Castellini et al. 2002).

Compassion in World Farming has stated that rapid growth rates in meat chickens leads to painful leg disorders; strain on the heart and lungs; fatigue; and also impacts on birds' ability to perform their natural behaviours such as walking, pecking, scratching and perching.[901] Similarly, Mohammadigheisar *et al*. found that fast-growing breeds are associated with metabolic and skeletal disorders:[902]

> The emphasis on production characteristics has compromised the ability of modern conventional broilers to cope with metabolic and skeletal disorders. This comparison of conventional and slow-growing broilers indicated that genetic selection has improved the gut efficiency in conventional broilers which is one of the influential factors on increased growth rate. However, the relative tibia ash content of conventional birds was lower than in slow-growing broiler chickens which might be an index for skeletal disorders in conventional broiler chickens.



Michael Brooks of PIANZ informed us that the latest research out of the University of Guelph by Tina Widowski showed that there is "actually currently no… credible welfare science, that says [the use of slow-growing breeds] makes a difference"[903] to the welfare issues associated with selective breeding of broiler chickens for fast-growth. However, Widowski participated in the Mohammadigheisar *et al*. research, outlined above, which suggests the opposite. Widowski has informed us that the results of her latest research are yet to be released.[904]

899 Simran Singh, Harshit Verma, D. Chakraborty "Ascites Syndrome, A Challenge for Blooming Poultry Industry" (2018) 5 Int. j. adv. agric. sci. technol. 9 at 10

900 Michael C. Morris "The ethics and politics of animal welfare in New Zealand: broiler chicken production as a case study" (2009) 22 J. Agr. Environ. Ethic 15 at 21

901 Compassion in World Farming "Farm Animals: Chickens farmed for meat" <https://www.ciwf.org.uk/farm-animals/chickens/meat-chickens/#growth>

902 Mohsen Mohammadigheisar, Victoria L. Shouldice, Stephanie Torrey, Tina Widowski and Elijah G. Kiarie "Research Note: Comparative gastrointestinal, tibia and plasma attributes in 48-day-old fast-and slow-growing broiler chicken strains" (2020) Poultry Sci at 5

903 Interview with Michael Brooks, above n 19

904 Email from Professor Tina Widowski (Professor of Animal Biosciences at University of Guelph and Egg Farmers of Canada Chair in Poultry Welfare) to the author regarding her latest research on slow-growing breeds (6 May 2020). Professor Widowski stated: "I'm sorry but cannot provide results until we do formal reporting."

NAWAC recognised the risks of selective breeding for fast growth in its report on the code of welfare,[905] however it neglected to include any mandatory provisions in the code of welfare in relation to this. This is despite findings by Bagshaw *et al*. that one of the key factors underlining welfare issues for meat chickens is fast growth rates due to intense genetic selection and nutrient supply. The authors stated there are a number of methods for moderating the effects of this, including reducing "the rate of growth early in the rearing period; [increasing] the level of locomotory activity; and, [reducing] the incidence of pathogens in the environment or incidence of disease."[906] Bagshaw *et al*. was cited in the NAWAC report but these findings were not discussed.

Research by MPI also confirms that welfare issues relating to high growth rates continue to persist in New Zealand. For instance, a 2013 survey by MPI compared a 2005 study to a 2011 study on lameness in meat chickens. A significant proportion of the chickens monitored in the 2011 study – being 30% of all birds monitored - had a "compromised ability to move".[907] Heavier and older Ross birds were particularly affected, with 56% of the meat chickens in this category experiencing lameness in the 2011 study (versus 15% in the 2005 study).[908] The 2013 survey also demonstrated that there had been an increase in average growth rate of birds since 2005, and identified a range of issues associated with fast-growing breeds, including metabolic problems (e.g. the failure of organ systems); cardiovascular problems (such as ascites and sudden death syndrome); skin lesions caused by contact dermatitis of the food pads, hocks and breast with moist litter; and leg disorders such as spondylolisthesis (kinky-back), tibial dyschondroplasia, valgus-varius deformity (twisted legs) and rotated tibia; as well as infectious causes of lameness (e.g. caused by bacterial chondronecrosis of the bones and viral and fungal infections).[909] MPI made a range of recommendations including further studies regarding the influence of thinning and stocking density on behavioural activity and leg health; close monitoring of changes in industry production methods such as breed, growth rate and slaughter weight on leg health; a further study on the impact of reduced walking ability of birds with a Gait Score (**GS**) 3 lameness scoring; and a renewed focus on improving and monitoring the effectiveness of culling where birds are experiencing high levels of lameness (GS 4 and GS 5). It is unclear whether and how these recommendations have been advanced.

Similarly, a 2018 article noted a study by AgResearch confirming that the leg health of broilers remains compromised due to high growth rates:[910]

> Recently AgResearch scientists studied the leg health of 6409 broilers on 20 North Island farms. Since last carrying out similar research in 2005, they discovered an increase in shed and flock sizes, and a hike in the average growth rate of the birds. They also found evidence that heavier and older birds were becoming more lame. Veterinary Association chief vet Dr Helen Beattie is worried about

905 "This code sets minimum standards for meat chicken production in New Zealand based on current scientific knowledge and industry practice. Although New Zealand meat chicken welfare standards are at least as good as and often slightly better than international standards, NAWAC has concerns about the welfare implications of trends in this industry, particularly in relation to growth rates. The rapidity of chicken growth that enables harvesting at about 5 weeks of age risks creating birds that may spend part of their short lives in pain from lameness, and the fully-housed production systems risk producing birds that are unable to develop and display normal behaviours. The industry needs to take steps to ensure these trends do not create future welfare problems that will not be ethically acceptable to New Zealanders." National Animal Welfare Advisory Committee, above n 886, at 9

906 Bagshaw, C.S. and Matthews, L.R. *Broiler welfare – a review of the latest research and projects in progress internationally* (Ministry of Agriculture and Forestry, October 2001) at 2

907 Jim Webster, Catherine Cameron and Andrea Rogers "Survey of Lameness in New Zealand Meat Chickens" (Ministry for Primary Industries, MPI Technical Paper No: 2013/45, October 2013) at 1 These birds had a Gait Scoring of 3-5 (from 0 = normal to 5 = incapable of walking), with "pathological examinations… carried out on a selection of birds with a compromised ability to move (GS of 3, 4 and 5)."

908 At 1. These birds had a Gait Scoring of 3-5 (from 0 = normal to 5 = incapable of walking), with "pathological examinations… carried out on a selection of birds with a compromised ability to move (GS of 3, 4 and 5)."

909 At 3

910 Hutching, above n 21

> the trend towards heavier birds. 'Rapidly growing chickens are of concern when growth rates are such that normal physiological processes (adequate respiration, healthy bones and muscles) and behaviours (walking, foraging, displaying natural behaviours) cannot be undertaken due to chicken growth rate, and/or body weight'.

Recently, NAWAC recognised in a report on selective breeding that:[911]

> Selection for high juvenile growth rate, breast-meat yield and efficiency of feed conversion has left meat chickens vulnerable to welfare problems such as cardiovascular disease, and lameness or difficulty in walking (Webster, Cameron and Rogers 2013; Dawkins and Layton 2012).

On 24 February 2020, we made an Official Information Act 1982 request to MPI regarding research conducted by MPI on the detrimental effects of using fast-growing broiler breeds on meat chicken health and welfare; what actions MPI plan to take on this issue; and if MPI plans to take no action, then why are they taking no action. MPI filed for an extension regarding this on 23 March 2020 and on 17 April 2020, sent us a further letter with links to the Code of Welfare (Meat Chickens) 2018 and to NAWAC's publicly available 2017 report on selective breeding. No other information was provided. We can thus infer that no further research has been undertaken by MPI on this issue beyond what is already publicly available.

In the United Kingdom, the RSPCA has recommended a restricted growth rate potential of 45 grams a day (although no similar recommendations have been made in New Zealand by the RNZSPCA or MPI / NAWAC).[912] And a range of international animal welfare organisations have come together to draft the European Chicken Commitment[913] and the Better Chicken Commitment (United States and Canada),[914] both of which outline as one of their requirements the adoption of:

> …breeds that demonstrate higher welfare outcomes…[such as] Hubbard JA757, 787, 957, 987, or NorfolkBlack; Rambler Ranger, Ranger Classic, or Ranger Gold; or others that meet the criteria of the RSPCA Broiler Breed Welfare Assessment Protocol or Global Animal Partnership (GAP).

Numerous corporations have adopted these recommendations, including Burger King, Chipotle Mexican Grill, Compass Group, Nestle, Subway and Dennys,[915] as well as KFC, Marks and Spencer, Unilever, Danone and the Elior Group in Europe.[916]

Selective breeding and high growth rates appear to be the most significant welfare issue affecting meat chickens. Thus, NAWAC's omission to adequately canvass these issues in the code of welfare and regulations is of particular significance, especially when we consider the sheer number of meat chickens

911 National Animal Welfare Advisory Committee, above n 121, at 16

912 T.A. Jones and J. Berk "Alternative systems for meat chickens and turkeys: Production, Health and Welfare" in Victoria Sandilands and Paul Hocking (ed) *Alternative Systems for Poultry: Health, Welfare and Productivity* (CABI, UK, 2012) 250 at 252

913 Open letter from animal welfare organisations (Albert Schweitzer Stiftung für unsere Mitwelt (Germany), Anima International (Global), Animal Equality (Germany, Italy, Spain, UK, Global), Center for the Ethical Attitude Towards Nature (Belarus), Çiftlik Hayvanlarını Koruma Platformu (Turkey), Compassion in World Farming (France, Italy, Ireland, Netherlands, Poland, UK) , Deutscher Tierschutzbund (Germany), Djurens Rätt (Sweden), Een DIER Een VRIEND (Netherlands), Equalia (Spain), Eurogroup for Animals (Pan-European), Fundacja Alberta Schweitzera (Poland), GAIA (Belgium), Humane Society International (global), Irish Society for the Prevention of Cruelty to Animals (Ireland), L214 (France), Menschen für Tierrechte (Germany), Oikeutta eläimille (Finland), Otwarte Klatki / Open Cages (Poland, Ukraine), OZ VEGÁNSKE HODY (Slovakia), Pro iure animalis (Germany), PROVIEH (Germany), ProVeg International (Germany, global), Royal Society for the Prevention of Cruelty to Animals (UK), Slepice v Nouzi (Czech Republic), The Humane League (UK, global), VGT (Austria), Vier Pfoten / Four Paws (Austria, Germany, UK, Bulgaria & Switzerland), Welfarm (France), World Animal Protection (UK, global) to European corporates regarding minimum standards for broiler welfare (undated).

914 Open letter from numerous animal welfare organisations (the Humane League, Animal Equality, Mercy for Animals, World Animal Protection, Canadian Coalition for Farm Animals, The Humane Society of the United States, Humane Society International (Canada), ASPCA, Compassion in World Farming and Four Paws) to American and Canadaian corporates (November 2019)

915 Better Chicken Commitment "Commitments" <https://betterchickencommitment.com/>.

916 Tony McDougal "KFC signs up to European Better Chicken commitment" *Poultry World* (online ed, England, 19 July 2019).

farmed in New Zealand (being 125 million – more than any other animal). This may be subject to change in the near future, with NAWAC currently in the process of developing regulations in relation to meat chickens that may encourage chicken breeders to import slow-growing breeds.[917] However this remains to be seen.

We note that any improvements in selective breeding may also need to be coupled with lower stocking densities. Hans Kriek of SAFE stated:[918]

> …if you were to get a better genotype of birds, which is stronger and more able to walk, then you need to give more space as well because if you don't it frustrates the living daylights out of them.

917 Quoting Arnja Dale, Harris and Pullar-Strecker, above n 889, and as outlined in National Animal Welfare Advisory Committee, above n 542

918 Interview with Hans Kriek, above n 15

6.3 STOCKING DENSITY

Minimum standard 10(b) (Stocking Densities) provides that stocking density in sheds must not exceed 38kg of live weight per m^2 of floor space, with the recommended best practice section providing for a stocking density not exceeding 30kg of live weight per m^2.

On the first reading of the Animal Welfare Amendment Bill 2013, 27 August 2013, Hon Phil Twyford asserted that 38kg of live weight per m^2 in effect allows for 19 birds per m^2.[919] PIANZ considers this figure to be somewhat lower, at 15 chickens per m^2.[920] A recent article notes that at their heaviest meat chickens are 2.5kg[921] - this would equate to 15.2 birds per m^2 when chickens are at their heaviest. By contrast, under the Code of Welfare (Layer Hens) 2018, layer hens in barn-systems are reared at a stocking density of 7 birds per m^2, or 9 birds per m^2 where the hens have access to an outdoor area.[922] Currently, 30.6% of layer hens are reared in such outdoor systems.[923] Even when housed in colony cages, layer hens are stocked at a lower density when compared to meat chickens of 13 hens per m^2 (which equates to 750 cm^2 per bird,[924] only slightly larger than an A4 piece of paper).

There is a range of welfare issues associated with meat chickens being stocked at high densities. These include inhibited locomotion and exploration,[925] and meat chickens spending more time sleeping, congregating around feeders and being more fearful.[926] High stocking densities result in an inability to move and explore, which can lead to conditions such as contact dermatitis.[927] Birds in such environments are more likely to be exposed to higher ammonia levels, irritating their eyes and respiratory systems.[928] It has also been shown that high stocking densities lead to an increase in lameness in broiler chickens and to health issues relating to the legs of broiler chickens generally:[929]

> …leg strength showed a major decrease as stocking densities increased from 6 to 23 kg/m^2, hock dermatitis increased as densities increased from 35 to 56 kg/m^2, and footpad dermatitis and fearfulness were increased at the highest density of 56 kg/m^2 (Buijs et al., 2009).

A 2013 survey by MPI on lameness in meat chickens recognised that where stocking density is high this is "likely to reduce activity and contribute to an increased prevalence of leg weakness."[930] Further, high stocking densities have a negative impact on gut health in meat chickens, predisposing chickens to necrotic enteritis.[931]

919 Coumbe, above n 441, at 5, footnote 19.
920 Email from Michael Brooks (PIANZ) to the author, 9 December 2019.
921 Hutching, above n 21
922 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 6
923 Conventional cages, otherwise known as battery cages, currently account for 44.7% of egg production. At present "the remaining eggs are being farmed in colony cage systems (24.7%), barns and free-range (30.6%). Organic eggs make up around 1%." Egg Producers Federation "Egg Farming in NZ" <https://www.eggfarmers.org.nz/egg-farming-in-nz>
924 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 6
925 Robins and Phillips, above 898, at 351
926 At 351
927 At 351
928 At 351
929 At 360
930 Webster et al, above n 908, at 23
931 V. Tsiouris, I. Georgopoulou, C. Batzios, N. Pappaioannou, R. Ducatelle & P. Fortomaris "High stocking density as a predisposing factor for necrotic enteritis in broiler chicks" (2015) 44 Avian Pathology 59.

AN INDUSTRY VIEW

Michael Brooks of PIANZ stated: "practice in New Zealand is to have a peak of 34 kgs giving leeway for 38 kgs in case of emergency."[932] He commented too that "… the stocking density of say, 36 kg, would only be reached for 2 days of life – most of the time it's well down at the low 30s or even 20s in terms of stocking density."[933] NAWAC has similarly noted "meat chickens are only at maximum stocking density for a relatively short period at the end of the grow-out-period."[934] Figure 4 was provided by Michael Brooks of PIANZ and EPF to show how stocking density works in practice, with live weight totalling 34kg at 30 days, after which 'harvesting' of birds results in a decrease in stocking density.

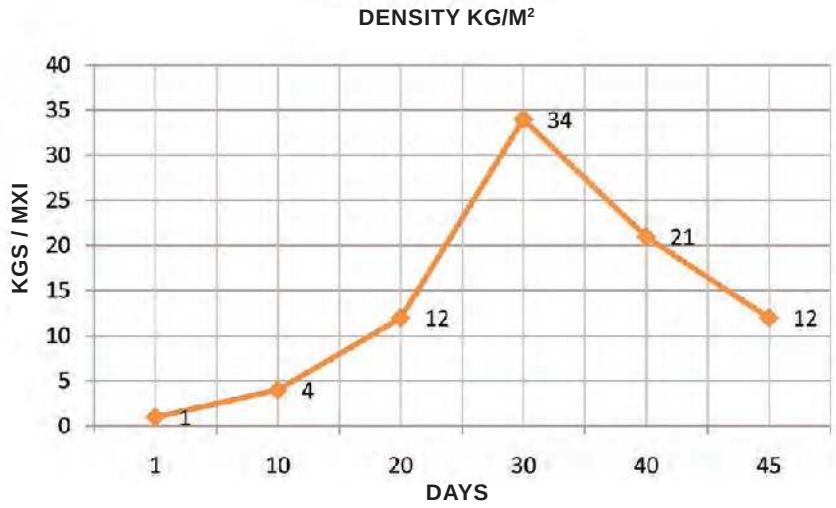


Figure 4. Stocking Density in Practice – Provided by PIANZ

We have re-drawn this figure to make it more legible, however no substantive changes have been made.

However, we note that given the lack of proactive monitoring and enforcement by MPI, it would be quite difficult to verify if this chart reflects actual practice. Further, MPI has stated there may be welfare issues associated with this practice:[935]

> There is evidence from other studies that the practice of thinning a flock (removal of a sub-group of birds for slaughter at an earlier age and lower LW), which enables a higher number of birds to be initially placed in a shed than would be possible if all birds were grown to the final LW, could contribute to leg weakness and this possibility should be studied further.

NEW ZEALAND COMPARED TO INTERNATIONAL STANDARDS

In its 2011 report to the code, NAWAC compared New Zealand to the European Union and the United Kingdom,[936] finding that New Zealand stocking densities are lower than those typically found overseas and historically "on a par with global best practice."[937] At this time the United Kingdom had a maximum stocking density of 39 kg/m^2 and the European Union 33 kg/m^2 (although up to 42kg/m^2 is allowed under improved

932 Email from Michael Brooks to the author, 9 December 2019
933 Interview with Michael Brooks, above n 19
934 National Animal Welfare Advisory Committee, above n 886, at 7
935 Webster et al, above n 908, at 1
936 National Animal Welfare Advisory Committee, above n 886, at 6
937 At 2

management conditions).[938] The same perspective was echoed by Michael Brooks of PIANZ, who stated "our maximum stocking density is low by international standards."[939] In light of comparable international standards, NAWAC decided to set a maximum stocking density of 38kg.

However, NAWAC's reasoning was problematic. While its own guidelines state that it may take into consideration "international trends",[940] the Act does not define acceptable animal welfare standards as those comparable to the standards of other countries. Rather, the standard prescribed by Act is what is required to meet the health, physical and behavioural needs of animals in accordance with good practice and scientific knowledge.[941] In addition, NAWAC's own guideline states:[942]

> NAWAC will not formulate codes by following international trends, industry demands or public opinion. Its *obligation* is to work to improve animal welfare by rigorous evaluation of relevant science, practical experience and good practice first, with economics, international trends and public ethical concerns modulating that information.

SCIENTIFIC LITERATURE REVIEWED BY NAWAC

Some commentators have also questioned the scientific literature referenced by NAWAC. Sankoff noted that there were some international studies NAWAC did not consider in its analysis of high stocking densities and the consequent impact on meat chicken health in its 2004 report on the 2003 code.[943] This included work by the Scientific Committee of Animal Health and Animal Welfare on behalf of the European Commission, Health and Consumer Protection. The Committee linked pathologies such as breast blisters, chronic dermatitis and leg disorders to high stocking density and found that walking ability is highly impacted by high stocking densities. It recommended European stocking densities be no more than 25kg per m^2 (approximately 12 birds per m^2):[944]

> It is clear from the behaviour and leg disorder studies that the stocking density must be 25 kg/m^2 or lower for major welfare problems to be largely avoided and that above $30kg/m^2$, even with very good environmental control systems, there is a steep rise in the frequency of serious problems.

Sankoff cited a number of studies, which have to come to similar conclusions.[945] The 2011 NAWAC report to the revised 2011 code did cite the European Commission study, in particular NAWAC noted that "above 30 kg/m^2 there is an increased risk of serious welfare problems."[946] However, NAWAC did not reiterate the

938 At 6
939 Interview with Michael Brooks, above n 19
940 National Animal Welfare Advisory Committee *NAWAC Guideline 01: Approach to consideration of draft codes of welfare* (Ministry for Primary Industries, 17 February 2016)
941 Animal Welfare Act 1999, s 9(2)(a)
942 National Animal Welfare Advisory Committee, above n 941, at 2
943 Scientific Committee on Animal Health and Animal Welfare *The Welfare of Chickens Kept for Meat Production (Broilers) (*European Commission: Health and Consumer Protection Directorate-General, SANCO.B.3/AH/R15/2000, 21 March 2000) as cited in Sankoff, above n 38, at 22
944 At 66
945 Professor Donald M. Broom "Sustainability and Animal Welfare with Reference to Developments in Poultry Welfare" (2001) 14 ANZCCART News and A.L. Hall "The Effect of Stocking Density on the Welfare and Behaviour of Broiler Chickens Reared Commercially"(2001) 10 Animal Welfare 23 as cited in Sankoff, above n 38, at 22
946 National Animal Welfare Advisory Committee, above n 886, at 6

Scientific Committee's recommendation that stocking densities should be no more than 25kg/m^2. Notably, stocking density has not changed in the 15 years since Sankoff wrote this article.

In justifying its approach, NAWAC stated:[947]

> A study by Dawkins et al. (2004) showed that although very high stocking densities (42 and 46 kg/m^2) did affect the welfare of meat chickens, stocking density *per se*, within limits, was less important than environmental factors, including temperature, humidity and aspects of stockmanship.

However, Broom and Fraser have subsequently critiqued this finding, stating that the Dawkins *et al*. study was flawed as it "did not consider stocking densities of less than 30 kg/m^2."[948] Broom and Fraser noted that Dawkins et al:[949]

> …did find that locomotor problems were twice as high at 46 as at 30 kg/m^2 and lumped all other variables to compare with stocking density. Their results do not allow the conclusion that stocking density is unimportant, in part because the farmers had notice that the researchers were coming to take measurements.

Other studies cited by NAWAC in support of this proposition also noted that their findings did "not mean that stocking density is unimportant, but [that] lowering stocking density on its own, without regard to the environment the birds experience is not sufficient."[950] Similarly, Estevez noted that "stocking density has major consequences for the health and welfare of broilers",[951] and recommended a stocking density between 34 to 38kg per metre squared.[952]

Subsequent to this, De Jong *et al*. outlined that while:[953]

> …large variation in environmental factors may obscure density effects…studies on commercial farms showed a decrease in growth rate and walking ability as stocking density increased, and increased disturbance of rest, as well as increase in skin scratches, hock burn and food pad dermatitis as stocking density increased which are all indicative of decreased welfare.

There are also issues associated with how NAWAC interpreted the studies cited in its report. NAWAC referred to a study by Bagshaw *et al*. to justify its assertion that "the proportion of birds with severe leg weakness [in New Zealand] was about a quarter of that reported in several European countries",[954] and its finding that this meant current stocking densities in New Zealand were appropriate. Bagshaw *et al*. found that approximately 18% of birds on average had a gait score of three, with 0.78% and 0.1% of birds having a gait score of four and five, respectively.[955] Bagshaw *et al*. did not compare like with like, in that they only considered gait scores of 4-5 to constitute 'severe leg weakness', whereas the European studies

947 At 6

948 Professor Donald M Broom and Andrew F Fraser "The Welfare of Poultry" in *Domestic Animal Behaviour and Welfare* (5th ed, Cabi, UK, 2015) 308 at 323

949 At 323

950 Jones, T.A., Donnelly, C.A. and Stamp Dawkins, M. "Environmental and management factors affecting the welfare of chickens on commercial farms in the United Kingdom and Denmark stocked at five densities" (2005) 84 Poult. Sci. J. 1155 at 1155

951 Estevez, I. "Density allowances for broilers: Where to set the limits?" (2007) 86 Poult. Sci. J. 1265

952 Estevez, above n 952

953 I. de Jong, C. Berg, A. Butterworth, I. Estevéz *Scientific Report Updating the EFSA Opinions on the Welfare of Broilers and Broiler Breeders - Part A - The Welfare of Chickens Kept for Meat Production* (European Food Safety Authority (EFSA), Supporting Publications 2012: EN-295, 2012) at 41.

954 National Animal Welfare Advisory Committee, above n 886, at 7

955 Bagshaw et al, above n 120, at 3. The report does not state the precise figure for the incidence of meat chickens with a gait score of three, however, the average across all groups is outlined in the table at 28.

they compared themselves to considered gait scores of 3-5 to constitute 'severe leg weakness'.[956] Further, SCAHAW, also cited by NAWAC in its report, refers to the European studies Bagshaw *et al*. used. It stated that the proportion of birds with gait scores of three – five in these studies were as low as 10%, and as high as 30%.[957] It also cites an additional European study showing incidence of 'severe leg weakness' being as low as 3%.[958] These findings suggest that at that time New Zealand may in fact have had *higher* rates of lameness in meat chickens than in Europe, at 18-19% compared to 3% and 10% in two of these European studies. However, NAWAC did not refer to these findings in its discussion on severe leg weakness and maximum stocking densities.

RECOMMENDATIONS FOR CHANGE

The impact of high stocking densities on meat chickens in New Zealand is an example of how the codes of welfare may undermine the Act. Such high densities appear to be inconsistent with the 'physical, health and behavioural needs' of meat chickens, such as the requirement under the Act to protect animals from significant injury or disease (being one element of the statutory definition of 'physical, health and behavioural needs).[959] As Rodriguez-Ferrere commented:[960]

> The commercial meat chicken industry is entirely based on intensive production and while there is consumer demand for low-price chicken meat, the industry will continue to be based on intensive production systems. As such, they conflict with the principles of the five freedoms of animals, particularly the duty to provide for the opportunity to display normal patterns of behaviour, and would be an offence if it were not for the defence of compliance with a code of welfare.

Dr Arnja Dale of the RNZSPCA (and current committee member of NAWAC) has stated that "there should not be more than 12 [meat chickens] per square metre"[961] and that she "would like to see fewer than 30kg of chickens per square metre at all times."[962] The code should be amended to require this, especially given that NAWAC has "[acknowledged] that high stocking densities are associated with a greater risk to meat chicken welfare"[963] and recognised that above "30 kg/m^2 there is an increased risk of serious welfare problems."[964]

There have been significant shifts by global corporates to adopt lower stocking densities. Multiple corporations such as KFC and Nestle have signed up to the Better Chicken Commitment (in the United States and Canada),[965] as well as the European Chicken

956 These studies are Kestin S.C., T.G. Kowles, A.E.Tinch and N.G.Gregory "Prevalence of leg weakness in broilerchickens and its relationship with genotype" (1992) 131 Vet.Rec.190 and Sanotra G.S. "Recording of current leg strength in broilers" (1999) Dyrenes Beskyttelese (DanishAnimal Welfare Society)

957 Scientific Committee on Animal Health and Animal Welfare, above n 944, at 36

958 At 36, citing an unpublished study of 25,000 birds in the United Kingdom by the British Chicken Association at the requets of the Farm Animal Council.

959 Animal Welfare Act 1999, s 4

960 Wells and Ferrere, above n 158, at 480

961 Hutching, above n 21

962 Hutching

963 National Animal Welfare Advisory Committee, above n 886, at 6

964 At 6

965 Open letter from numerous animal welfare organisations (the Humane League, Animal Equality, Mercy for Animals, World Animal Protection, Canadian Coalition for Farm Animals, The Humane Society of the United States, Humane Society International (Canada), ASPCA, Compassion in World Farming and Four Paws) to American and Canadaian corporates (November 2019)

Committee,[966] both of which require a comparatively lower stocking density of 30 kg per metre squared to be used on meat chicken farms.[967] The 2018 European Parliament even passed a resolution, which highlights the need for broiler welfare improvements, including "stocking densities that do not increase the risk of disease."[968]

In 2017 MPI advised that stocking densities for layer hens and meat chickens would be reviewed as part of its establishing new regulations in regards to animal welfare.[969] No regulations have been promulgated yet in regards to stocking densities, although it does appear that new regulations will be introduced within the next three years, and these may include a reduction in the current maximum of 38kg per m^2.[970] It appears that NAWAC has agreed this would be appropriate, as it has stated it agrees "with new regulation reduction from 38kg to 30kg of live weight per square metre… 32 is the optimal number…"[971]

6.4 BEHAVIOURAL NEEDS

Minimum Standard No 11 (Providing for Behavioural Needs) provides that:[972]

> Chickens must have the opportunity to express their normal behaviours. These include, but are not limited to, feeding, drinking, sleeping, preening, walking, scratching, ground pecking, leg stretching, and vocalising.

The NAWAC report to the meat chickens code of welfare recognised the importance of a number of other behaviours, stating that "The behavioural repertoire of the chicken includes walking, jumping, flying, roosting, exploration, pecking, scratching and dust bathing."[973] However the code omitted a number of these recognised behaviours in the minimum standard, namely jumping, flying, roosting, exploration and dust bathing. The code does not provide for other natural behaviours such as perching, foraging or running.[974] And it does not recognise a number of behaviours that are provided for in the Code of Welfare (Layer

966 Open letter from animal welfare organisations, above n 914

967 See Alessio Perrone "Suffering of chickens at farms supplying major supermarkets revealed in undercover footage" *Independent* (online ed, UK, 10 August 2019) and Jake Davies "What the 'Better Chicken Commitment' means for farmers" *Farmers Weekly* (online ed, UK, 8 February 2020)

968 European Parliament "European Parliament resolution of 25 October 2018 on animal welfare, antimicrobial use and the environmental impact of industrial broiler farming" <https://www.europarl.europa.eu/doceo/document/TA-8-2018-0429_EN.html>

969 Ministry for Primary Industries, above n 41, at 13 and 33

970 Quoting Arnja Dale, Harris and Pullar-Strecker, above n 889

971 National Animal Welfare Advisory Committee, above n 523 at 20

972 Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 11 (Providing for Behavioural Needs)

973 National Animal Welfare Advisory Committee, above n 886, at 7

974 Robins and Phillips, above n 898 identifies scratching, foraging and dust-bathing as natural behaviours and also considers the use of perching materials, pecking objects and straw bales (as perching space and to provide more foraging material) in order to "expand birds' behavioural repertoire."

Hens) 2018, including perching,[975] with no clarification being given in either of the codes or NAWAC's reports as to why such behaviours are mandatory for layer hens but not required in relation to meat chickens.

The recommended best practice section of minimum standard 11 does state that chickens should be provided with environmental enrichment, including bales of hay or straw; perches/barriers; pecking objects; peat moss or sand to promote dust bathing and other activity; and the use of a radio in sheds to accustom chickens to a range of noises and voices.[976] However, the provision of these is not mandatory with none of these behaviours being included in the mandatory minimum standard relating to the behavioural needs of meat chickens.

In its report NAWAC recognised the importance for animal welfare of providing material to enable meat chickens to "perform explorative and manipulative behaviours."[977] However this was included as a recommended best practice only, rather than as a minimum standard. Other enhancements such as perches were not referenced at all. As Hans Kriek of SAFE stated, perches are necessary:[978]

> …because for a chicken to sleep on the floor of a shed is unnatural, chickens in the wild would always choose to sleep in the trees, away from predators. And it's better for their leg health as well.

Perches, then, are then another notable omission.

NAWAC further cited a number of studies in its report showing that "chickens are motivated to seek opportunities to explore novel stimuli (Newberry, 1999; Kells et al., 2001, Bizeray et al., 2002)"[979] when provided with supplementary resources such as bales of straw, peat moss, sand or perches/barriers and with novel objects such as rubber boots, trays of sand or mirrors. NAWAC noted a study finding that the provision of such stimuli also increased activity in meat chickens.[980] The inclusion of objects to peck at has also been suggested by animal welfare advocates e.g. hanging CDs.[981]

Michael Brooks of PIANZ informed us that there has been some debate as to whether the provision of such stimuli would actually help to facilitate the expression of chickens' normal behaviours.[982] However, subsequent studies have reinforced NAWAC's findings regarding the benefit of such materials. Bergmann *et al*. found that increasing complexity in the environment through the provision of perches, straw bales, pecking stones and access to a roofed outside run led to increased resting and lying; increased activity (particularly in the outdoor run area); increased pecking (of the pecking stones and straw bales); and the use of perches.[983] Over all, the "provided enrichment was well accepted and used"[984] in this study. Riber *et al*. found that panels, barriers and bales of straw can all be forms of effective environmental enrichment, as meat chickens use these for perching or as a quiet resting area to lie against with reduced

975 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 12(a) (Behaviour)

976 Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 11 (Providing for Behavioural Needs), Recommended Best Practice (a) (i) – (v)

977 National Animal Welfare Advisory Committee, above n 886, at 8

978 Interview with Hans Kriek, above n 15

979 National Animal Welfare Advisory Committee, above n 886, at 7 – 8

980 Kells, A., Dawkins, M.S. and Cortina Borja, M. "The effect of a 'freedom food' enrichment on the behaviour of broilers on commercial farms" (2001) 10 Animal Welfare 10, 347 as cited in National Animal Welfare Advisory Committee, above n 886, at 7 – 8

981 For example, Michael Brooks of PIANZ and EPF refer to Dr Roslyn Holland and Marion McDonald of SAFE who are interested in such enhancements as regards future reviews of the codes of welfare for layer hens and meat chickens.

982 Interview with Michael Brooks, above n 19

983 S. Bergmann, A. Schwarzer, K. Wilutzky, H. Louton, J. Bachmeier, P. Schimdt, M. Erhard, E. Rauch "Behaviour as welfare indicator for the rearing of broilers in an enriched husbandry environment – A field study" (2017) 19 Journal of Veterinary Behaviour 90.

984 At 90

disturbance.[985] Additionally, the authors found that the provision of a foraging substrate such as sand can lead to increased foraging and reduced inactivity; that offering different substrates in smaller local quantities can stimulate dust bathing and foraging in preferred substrates (being moss-peat and oat husks); and that scattering feed rather than offering it in feeders stimulates activity of meat chickens.[986] Baxter *et al*. similarly found that birds used peat and oat hulls for dust bathing significantly more than other substrates such as straw pellets, clean wood shavings and litter.[987]

Despite this, the provision of such materials has not been included as a minimum standard in the code but only has a recommended best practice.[988] As a result, the vast majority of meat chickens in New Zealand are raised in a shed on a concrete floor that is covered in litter (consisting of woodchips), with no other environmental stimulation provided. Behaviours such as jumping, flying, roosting, exploration, dust bathing, perching and foraging are either limited or non-existent in this environment.

6.5 ACCESS TO THE OUTDOORS

There is no requirement in the code of welfare for meat chickens to have access to the outdoors. This is a clear omission. A recent report by a NAWAC inspector in regards to a meat chicken farm reported:[989]

> Between 8200-8700 18-week old chicks are delivered to the farm's four big sheds. They spend six-to-eight weeks indoors, never seeing the 'external environment', before those that have survived "thinning" or being culled are transported on for further 'ongrowing'.

Access to outdoor environments can have significant benefits for meat chickens, such as allowing them to exhibit normal behaviours such as dust and sunbathing.[990] Further, "an outdoor system can decrease stress conditions [and] rummaged feeding is a commonly proposed approach for promoting the natural behaviour and improving activities of chickens."[991] Morris stated that providing greater room to exercise:[992]

> …also improves leg strength. Kestin et al (1992) found fewer incidences of lameness in free range chickens. Mench et al. (2001) noted improvements in leg strength when broilers were able to scratch and perch.

El-Deek *et al*. suggested the use of an outdoor run for fast growing broiler chickens to facilitate their normal behaviours and thereby improve their welfare as such systems "enable the expression of a more diverse array of ancestral behaviour patterns, and greatest behavioural diversity has been observed in free-range systems."[993] However, there are risks involved with such systems, including a restriction in the ability of such chickens "to protect themselves from an unfavourable environment"[994] (e.g. resulting from bad weather).[995]

985 A.B. Riber, H.A. van der Weerd, I.C. de Jong, S. Steenfeldt "Non-invited review: Review of environmental enrichment for broiler chickens" (2018) 97 Poult. Sci. J 378.
986 Riber et al, above n 986
987 M Baxter, C.L. Bailie, N.E. O'Connell "An evaluation of potential dustbathing substrates for commercial broiler chickens" (2018) 12 Animal 1933
988 Code of Welfare (Meat Chickens) 2018, Minimum standard No. 11, (Recommended Best Practice (a)
989 Hutching, above n 21
990 A. El-Deek and K. El-Sabrout, above n 62, at 107
991 At 107
992 Morris, above n 901, at 20
993 A. El-Deek and K. El-Sabrout, above n 62, at 107
994 At 108
995 At 108 – 109

Minimum standard 3 (Shelter for Meat Chickens Outdoors) provides that where chickens *are* outdoors they must be provided with shelter. This is to protect chickens from adverse weather, and to encourage them to *actually* use the outdoor area, as without sufficient shelter they would be deterred from doing so given their natural fear of predation. The code recognises this in the introduction to minimum standard 3. It states:[996]

> Chickens may be fearful of wide open spaces, so by providing and managing the shade and shelter in the outdoor area, chickens are encouraged to use the outdoor area and display a wider range of natural behaviours.

However, there has been criticism of the adequacy of shelter provided to meat chickens with access to the outdoors. For example, Hutching stated:[997]

> Tegel says almost 25 per cent of its chickens are free range, although critics say the term is a misnomer as on average 31 per cent of the birds never actually go outside. They are sometimes too fearful because there is too little shelter to protect them. Poultry have an innate fear of being attacked by a predator such as a harrier hawk. And when they have everything they need indoors – a steady food and water supply, and a constant temperature – it does not make sense to go outside, unless they are encouraged to do so.

Meat chicken facilities with outdoor access utilise 'popholes' to enable the birds to access the outdoor. The code of welfare defines these as a "small opening that provides access between indoor and outside areas."[998] Numerous studies have found that approximately 80% of birds regularly use such popholes.[999] As such, approximately 20% of birds do not regularly access the popholes, meaning that they do not have regular access to the outdoors.

The code provides example indicators to clarify what the provision of sufficient shelter might look like under minimum standard 3, including that "[chickens] are observed to use the outside area regularly"[1000] and that "[overhead] shade or shelter is provided on the range at all times throughout the year in a manner that encourages full use of the range."[1001] Recommended best practice guidelines are also included, recommending the use of trees and shrub cover to encourage ranging behaviour and provide shelter and shade;[1002] enhancement of the outside area through the use of trees, shrubs, covered shelters and straw

996 Code of Welfare (Meat Chickens) 2018, at 9. Similarly, the NAWAC Report to the Code refers to scientific literature outlining the necessity of shelter in outdoor areas, stating "Domestic chickens are descended from the red junglefowl which inhabits dry forests in Asia (Dawkins et al., 2003). It is therefore not surprising that research shows that domestic free-ranging chickens prefer ranging areas with tree cover (Dawkins et al., 2003). However, ranging was also affected by season, temperature, time of day and ramp design (Dawkins et al., 2003; Jones et al., 2007). Whether tree cover was preferred because trees provide shade from the sun, dry areas for dust bathing and/or shelter from predators and the wind is not clear (Dawkins et al., 2003). However, even with the provision of trees for shade and shelter, use of the range was found to be generally quite low (Dawkins et al., 2003; Jones et al., 2007). NAWAC acknowledges the need for shade and shelter in production systems with access outdoors. It has therefore included a requirement for access to shelter from adverse weather and conditions to be managed within the minimum standard." National Animal Welfare Advisory Committee, above n 886, at 4

997 Hutching, above n 21

998 Code of Welfare (Meat Chickens) 2018 at 27

999 G.J. Richards, L.J. Wilkins, T.G. Knowles, F. Booth, M.J. Toscano, C.J. Nicol, S.N. Booth "Continuous monitoring of pop hole usage by commercially housed free-range hens throughout the production cycle" (2011) 169 Vet Rec 338; M. Singh,cd A.J. Cowieson "Range use and pasture consumption in free-range poultry production" (2013) 53 Anim. Prod. Sci. 1202; A.M. Gilani, T.G. Knowles, C.J. Nicol "Factors affecting ranging behaviour in young and adult laying hens" (2014) 55 British Poultry Science 127; H. Larsen, G.M. Cronin, S.G Gebhardt-Henrich, C.L. Smith, P.H. Hemsworth, J.L. Rault "Individual ranging behaviour patterns in commercial free-range layers as observed through RFID tracking"(2017) 7 Animal Poultry 21; Campbell et al, above n 1210. NAWAC has also referred to this, stating "New research indicates that 80% of birds will actually access the outdoors on a regular basis." National Animal Welfare Advisory Committee Minute, above n 1212, at [C 5]

1000 Code of Welfare (Meat Chickens) 2018 at 9

1001 At 9

1002 Recommended Best Practice (a)

bales to encourage chickens to move away from popholes and the perimeter of the house;[1003] and making sure chickens are accustomed to the outdoors only once they are fully-feathered to encourage ranging activity.[1004]

Given that adequate shelter is effectively a precondition to chickens accessing outdoor spaces, it would have been more appropriate for these example indicators and recommended best practices to have been expressed as minimum standards. The lack of a requirement for access to shelter is also contrary to s 4(b) of the Act, which includes adequate shelter in the definition of 'physical, health and behavioural needs' in relation to an animal.[1005]

Further, while the Layer Hens (Code of Welfare) 2018 advises that the spacing of shelter less than 10 m apart also encourages the use of the outside area,[1006] there is no equivalent guidance in the code of welfare for meat chickens.

1003 Recommended Best Practice (b)
1004 Recommended Best Practice (c)
1005 Animal Welfare Act 1999, 4(b)
1006 Code of Welfare (Layer Hens) 2018 at 9

6.6 TEMPERATURE AND VENTILATION

6.6.1 CONTINGENCY PLANNING

Minimum standard 8 (Temperature) provides that temperature in sheds must remain within a range that ensures good health and welfare of chickens.[1007] Minimum standard 7 (Ventilation) requires adequate ventilation to be provided.[1008]

Meat chickens are vulnerable to environmental changes in temperature and ventilation. This is particularly so for barn-raised meat chickens (which comprise the vast bulk of meat chickens in New Zealand, with only a minority being raised outside in free-range environments), as the chickens are unable to escape their environment should temperatures become too hot or too cold or ventilation systems break down.

Most systems in New Zealand are automated. This enables farmers to ensure that temperatures are set at an appropriate level and adjusted where needed. PIANZ and EPF representative Michael Brooks cites this as a unique strength of the industry:[1009]

> Your issues with free-range are like pastoral farming – you can't control the variables in the same way. A modern meat chicken shed – you have extraordinary control of the variables…it's all computer controlled so the minute there's a variation of degree in terms of humidity, temperature, water, feed, that's an alarm for the farmer.

However, these systems are not fool proof. This was evidenced recently in 2018 when 50,000 chickens burned to death in cages at Stoney Creek Farm in West Auckland (a hatchery that supplied Tegel), and again in 2019 when 190,000 chickens suffocated to death as a result of a power cut and subsequent generator failure at a farm in Helensville contracted to Tegel.[1010] The incident at Stoney Creek Farm led SAFE Head of Campaigns Manager Marianne Macdonald to call for an urgent review of farmed animal housing[1011] and welfare campaigners complained that the Helensville farm did "not proactively tell the authorities that anything had happened, and only did after they were dobbed in…"[1012]

Minimum standard 5(c) (Contingency Planning) provides that "Appropriate fire prevention measures and a fire emergency plan must be in place." Minimum standard 4(g) (Housing and Equipment) provides that "Controlled environment housing must have alarms that warn of power failure and/or significant temperature variance."[1013] It is also an example indicator under this minimum standard for all alarms, fire fighting equipment and emergency power supplies to be tested regularly and test results documented.[1014] Finally, minimum standard 5(b) provides that alternative means of "maintaining ongoing environmental control and provision of food and water must be available in case of emergencies, including power or computer failure or mechanical breakdown."[1015] In relation to the Helensville farm, we were told by Michael Brooks of PIANZ that:[1016]

1007 Code of Welfare (Meat Chickens) 2018, Minimum Standard No 8(c), at 14
1008 Minimum Standard No 7(a)
1009 Interview with Michael Brooks, above n 19
1010 Vita Molyneux "Almost 200,000 chickens suffocate to death at Helensville poultry farm" *Newshub* (online ed, New Zealand, 2 December 2019)
1011 "Animals always the losers on factory farms" *Scoop* (online ed, New Zealand, 27 Dember 2018)
1012 "Campaigners slam chicken farm where nearly 200,000 birds died" *RNZ* (online ed, New Zealand, 3 December 2019)
1013 Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 4(g)
1014 Minimum Standard No. 4(g), Example Indicator
1015 Minimum Standard No 5(b)
1016 Michael Brooks, email to the author, 9 December 2019

> This was [a] set of circumstances where there was (a) a power cut; (b) the back - up generator, which had passed its latest audit check, failed to cut in and supply power (all farms must have a back-up generator); (c) the first alarm system failed; (d) the second separate mobile phone based alarm system also failed, so 3 back-ups failed. The MPI /Tegel investigation will tell us what happened and why and the information will be shared to industry but [this was] an extraordinary set of circumstances.

While these automated systems enable farmers to control the environmental variables in which their birds are kept, it is also "recognised that these installations are vulnerable to things like power failure"[1017] – as demonstrated by the Helensville incident.

Regarding Stoney Creek, Michael Brooks of PIANZ stated:[1018]

> I am told that the issue here once the fire broke out was primarily due to the physical set up of the farm. It had been a breeder operation so all the sheds were interconnected to assist in management of breeder requirements. However this meant that when the fire stated it was difficult to isolate the blaze and it spread quickly. I understand it has led to a position whereby such a physical set up is seen as inappropriate for use as a meat chicken farm in the future. The details of why the fire occurred I am not sure of and I believe are the subject of the MPI investigation.

Despite this dramatic event, no amendments were made to the code of welfare or regulations for meat chickens regarding the use of such interconnected housing. Minimum standard 4 (Housing and Equipment) contains no reference to the use of such buildings being dangerous or inappropriate, and does not contain any standards or recommendations prohibiting the use of such buildings for housing meat chickens.

The code of welfare currently requires farmers to check on birds at least once a day. However some commentators consider that three or more checks a day would be more appropriate for commercial operations, given the consequences of power failure and the fact that these sheds often contain between 20,000 – 40,000 chickens.[1019] It should also be a mandatory minimum standard (rather than a recommended best practice) that all alarms, fire fighting equipment and emergency power supplies be tested regularly and test results documented.[1020]

1017 Quoting David Mellor, John Weekes "Mass chicken deaths 'catastrophic' and unprecedented, experts say after nearly 200,000 birds die" *Stuff* (online ed, New Zealand, 3 December 2019)
1018 Michael Brooks, email to the author, 5 May 2020
1019 Quoting Arnja Dale, Harris and Pullar-Strecker, above n 889
1020 Code of Welfare (Meat Chickens) 2018 at 10

6.6.2 OTHER ISSUES ASSOCIATED WITH TEMPERATURE AND VENTILATION

Minimum standard 8 (Temperature) provides that "brooder areas must be pre-heated before placement of chicks and the temperature maintained at a level that promotes good chick health and welfare." The explanatory 'Introduction' section to the standard recognises that:[1021]

> Newly hatched chicks have a reduced capacity to maintain adequate body temperatures and thus additional heat input is required to maintain the temperature of the brooding area around 30ºC plus.

It is disappointing that such guidance has not been adopted as a component of the minimum standard so that it is mandatory. Furthermore, the guidance itself is controversial. For example, Compassion in World Farming considers that newly hatched chicks require ambient temperatures of 32ºC to 35ºC and relative humidity of 60% to 70%.[1022]

An additional potential issue associated with temperature is that meat chickens may be at risk of heat exhaustion at high stocking densities, as Robins *et al*. explained:[1023]

> At high stocking densities the birds themselves prevent effective transfer of heat from the litter to the atmosphere, particularly in the late stages of growth restricting the ventilation system effectiveness (Bessei, 2006). Furthermore, at high stocking densities increased moisture content of the litter enhances microbial activity and heat generation (Bessei, 2006). Thermoregulation in meat chickens towards the end of the grow-out period is complicated by high energy diets, relative inactivity of the chickens and their growth- related increase in stocking density. Fast-growing chickens are predisposed to becoming heat stressed and if temperature and humidity are inadequate they often pant. In extreme cases birds can die from heat exhaustion.

Ammonia levels within the meat chicken environment is another concern. Minimum standard 7 (Ventilation) provides a maximum ammonia level of 20 ppm, with recommended best practice being 10 ppm. In its report to the code of welfare, NAWAC recognised:[1024]

> …research investigating avoidance behaviour of poultry in response to varying concentrations of ammonia [suggesting] that birds find environments with levels above 10ppm aversive (Jones et al., 2005).

Kristensen and Wathes found that when given the choice between levels of ammonia at 4, 11, 20 and 37 ppm, meat chickens were found to avoid the two highest concentrations of 20 ppm and 37 ppm.[1025] This study was cited by NAWAC in its report in support of the statement that ammonia is a "recognised air pollutant in poultry houses and exposure to high concentrations is detrimental to poultry health and can lead to pathological conditions."[1026] However, NAWAC neglected to discuss the findings of this study in relation to a clear preference by meat chickens for a fresh air environment.

Similarly, it has been found that "prolonged exposure to concentrations as low as 20 ppm can be detrimental to bird health and performance, when poultry remain in such an environment throughout the

1021 At 14
1022 Compassion in World Farming, above n 897, at 1
1023 Robins and Phillips, above 898, at 362
1024 National Animal Welfare Advisory Committee, above n 886, at 6
1025 Jones, E.K.M.; Wathes, C.A.; Webster, A.J.F. "Avoidance of atmospheric ammonia by domestic fowl and the effect of early experience" (2005) 90 Appl. Anim. Behav. Sci. 293at 293.
1026 National Animal Welfare Advisory Committee, above n 886, at 5

production period,"[1027] – particularly in relation to susceptibility to Newcastle's disease and respiratory tract damage.[1028] However, ultimately NAWAC decided to set the maximum ammonia level to 20 ppm "in line with international guidelines (Council of the European Union, 2007 and DEFRA UK, 2000)"[1029] – even though international comparability is not a criterion prescribed by the Act.[1030] While it is noted that NAWAC might reasonably consider international standards under s 73(d) of the Act, which allows NAWAC to consider "any other matters considered relevant", international comparability is not a criterion prescribed by the Act in the way that "good practice and scientific knowledge" is pursuant to s 73(b). NAWAC's frequent, and yet inconsistent, reliance on this particular consideration appears concerning when it is used to directly ignore the relevant scientific recommendations.

Finally, it is not a requirement of the code that ammonia levels be measured and monitored by farmers.[1031] This is problematic as it means we cannot be sure that the limits prescribed by the code are not being exceeded.

1027 C. W. Ritz, B. D. Fairchild, and M. P. Lacy "Implications of Ammonia Production and Emissions from Commercial Poultry Facilities: A Review" (2004) 13 J. Appl. Poult. Res.684 at 686

1028 Anderson, D. P., C. W. Beard, and R. P. Hanson. "Adverse effects of ammonia on chickens including resistance to infection with Newcastle disease virus" (1964) 8 Avian Dis. 369

1029 National Animal Welfare Advisory Committee, above n 886, at 6

1030 The requirements in both the European Union legislation (Council Directive 2007/43/CE (28 June 2007) at Annex II, [3(a)]) and the United Kingdom legislation ('Code of Welfare for the welfare of meat chickens and meat breeding chickens', Department for Environment Food & Rural Affairs at 19, 20 and 25) still set ammonia at 20ppm.

1031 This is merely included as an example indicator to the minimum standard, meaning that it is evidence of the minimum standards having been complied but with but is not mandatory in and of itself. Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 7 (Ventilation) Example Indicator

6.7 CATCHING

NAWAC has identified catching, loading and transport as an area of "very high risk. Birds are vulnerable."[1032]

Catching involves picking up meat chickens so that they may be transported from one location to another. Minimum standard 13 (Catching, Loading and Transport) provides that catchers must not carry more than four chickens in each hand at any one time, although the exact method of catching is unspecified.

Such techniques appear to be problematic. As Robins and Phillips noted, "[inverted] handling increases fear (Delezie et al., 2006) and elevates plasma corticosterone concentrations (Kannan and Mench, 1996), indicating that birds are more stressed than non-inverted controls."[1033] In its report on the code, NAWAC recognised the stress that catching can involve for birds and acknowledged that not inverting birds may reduce stress, bruising and injury.[1034] Despite this, NAWAC considered that there were no scientific studies, which assessed different manual catching techniques and their impact on bird welfare.[1035] Thus, the code of welfare and regulations do not prevent birds from being inverted when caught.

However since 2011 when the NAWAC report was released, there have been further studies on catching methods. Findings include that carrying birds under the abdomen in an upright position results in fewer wing fractures,[1036] and that hens experience significantly less stress when removed individually and gently from cages in an upright position.[1037] The code of welfare and/or regulations should be revised to account for this new research.

The code of welfare includes as a recommended best practice that "Mechanical systems should be used for catching and loading meat chickens."[1038] Numerous studies have found that mechanically catching meat chickens leads to a reduction in bruising;[1039] a reduction in injuries;[1040] and reduced stress as the birds are not in contact with humans, can be handled upright and may be moved more gently.[1041] Given the welfare benefits of mechanical catching, this recommended best practice could potentially replace the minimum standard.

1032 National Animal Welfare Advisory Committee, above n 523, at 20

1033 Robins and Phillips, above 898, at 360

1034 National Animal Welfare Advisory Committee, above n 886, at 8

1035 "Catching of birds often involves birds being caught by one leg, inverted and carried to transport crates with up to 4 birds being carried in one hand (Knierim and Gocke, 2003, Deleziel et al., 2006). This catching method has been shown to lead to injuries and bruising and is a major stressor for birds due to human contact and the process of being inverted (Lacy and Czarick, 1998; Delezie et al., 2006). A reduction in the number of birds carried simultaneously in this way may therefore not reduce the stress on the birds. In Sweden birds are often not inverted and this may reduce stress and the incidence of bruising and injury (Ekstrand, 1998). However, no scientific studies have assessed differences between different manual catching techniques and their impact on bird welfare." National Animal Welfare Advisory Committee, above n 886, at 8

1036 Käthe Elise Kittelsen, Erik Georg Granquist, Agnete Lien Aunsmo, Randi Oppermann Moe and Elisiv Tolo, "An Evaluation of Two Different Broiler Catching Methods" (2018) 15 Animals 141 at 1.

1037 C Weeks "Poultry handling and transport" in Temple Grandin (ed) *Livestock Handling and Transport* (4th edition, CAB International, Wallingford, UK, 2014) 378

1038 Code of Welfare (Meat Chickens) 2018, Minimum Standard No 13 (Catching, Loading and Transport), Recommended Best Practice

1039 M.P. Lacy, M. Czarick "Mechanical harvesting of broilers" (1998) 77 Poult. Sci. J. 1794.

1040 E. Delezie, D. Lips, R. Lips, E. Decuypere "Mechanical catching of broiler chickens is a viable alternative for manual catching from an animal welfare point of view" (2005) 23 Anim Sci Pap Rep 257

1041 Vizzier-Thaxton Y, Thaxton JP, and Shilling MW. "Hand versus mechanical catching and loading of broilers" (2006) 45 Poultry International 18. See also Weeks, above n 1038

6.8 LIGHTING

6.8.1 INSUFFICIENT HOURS OF CONTINUOUS DARKNESS IN A 24 HOUR PERIOD

Minimum standard 6 (Lighting) provides that lighting may be intermittent on meat chicken farms, with farmers able to "supply alternate periods of light and dark throughout a 24 hour period to optimise growth."[1042] After the first four days of raising a chick, farmers are required to provide a minimum of four hours of continuous darkness per day. If more than four hours of darkness are provided, each dark period must be a minimum of three hours of continuous darkness. This is in stark contrast with the code of welfare for layer hens, which provides at minimum standard 7 (Lighting) that a minimum of eight hours of continuous darkness in a 24-hour period is a mandatory requirement for layer hens.[1043]

In its report to the code of welfare for meat chickens, NAWAC recognised scientific literature recommending seven hours of darkness within a 24-hour period – three hours longer than the four hours which the code prescribes. NAWAC stated:[1044]

> Lighting schedules impact on meat chicken behaviour and welfare. Recent research has shown that increasing the length of the dark periods reduced overall bird mortality, led to an improvement in average gait score, a decrease in the number of birds falling into categories associated with pain, and increased bird mobility, time spent eating and comfort behaviours (Schwean-Lardner et al., 2009bc; Schwean-Lardner and Classen, 2010). The positive effect of increased dark periods on behaviour is supported by Bayram and Özkan (2010). Overall, near constant light (23L:1D) schedules appear unacceptable from a welfare perspective. Adding several hours of darkness (20L:4D) resulted in an improvement in all welfare parameters tested as well as production parameters (growth rate). This is reflected in the current Code, as the minimum standard requires a minimum dark period of four hours per day. According to Schwean-Lardner and Classen (2010), taking production and welfare indicators into consideration, 17 hours of light appears to be the optimum day length for meat chickens.

Given that NAWAC explicitly recognised the findings of these studies it is surprising and concerning that it did not provide for a longer duration of darkness in the code.

In particular, the Bayram and Özkan study that NAWAC cited compared meat chickens reared with a 24-hour light schedule to those reared with 16 hours of light and 8 hours of darkness in a 24-hour period. The authors found that birds in the latter group had a better welfare status, with a greater number of birds eating, drinking, walking-standing, pecking, preening, wing-shaking and socialising.[1045] Similarly, Alvino *et al*. (which is referenced elsewhere in the NAWAC report to the code) recognised that meat chickens should be provided with at least eight hours of near-darkness in a 24-hour period to encourage normal diurnal rhythms.[1046] However, NAWAC did not recognise this finding in its report. In light of these studies, there appears to have been no sound scientific reason to permit the period of continuous darkness in the code of welfare to be as low as four hours. Rather, NAWAC appears to have permitted this because "[current] industry practice in New Zealand is a minimum of 4 hours darkness in every 24h period…"[1047]

1042 Code of Welfare (Meat Chickens) 2018 at 12

1043 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 7(c)

1044 National Animal Welfare Advisory Committee, above n 886, at 4

1045 Bayram, A. and Özkan, S. "Effects of a 16-hour light, 8-hour dark lighting schedule on behavioural traits and performance in male meat chickens" (2010) 19 J Appl Poultry Res 263 cited in National Animal Welfare Advisory Committee, above n 886, at 10

1046 Alvino, G.M., Blatchford, R.A., Archer, G.S. and Mench, J.A. "Light intensity during rearing affects the behavioural synchrony and resting patterns of meat chickens" (2009) 50 British Poultry Science 275. "Near darkness" was defined as less than 5 lux.

1047 National Animal Welfare Advisory Committee, above n 886, at 4

The fact that the code allows the dark period to be partitioned where more than four hours of darkness is provided is also problematic. In its report NAWAC recognised a study by Schwean-Lardner et al, which found that interrupting the dark period in this way reduced comfort behaviours and possibly affected quality and length of sleep. NAWAC stated: "Partitioning of dark periods could thus have negative effects on bird welfare."[1048] Despite this, NAWAC permitted the dark period to be partitioned where more than four hours of darkness is provided, apparently on the basis that the EU requires at least one uninterrupted period of darkness of at least four hours, within a total of six hours required.

It is also concerning that the code of welfare does not define darkness within this context. This is not self-evident – for example, many papers that address light intensity during the dark period for meat chickens and layer hens vary in their definition of darkness. The standard measure for lighting is lux. This is an "international measure of light intensity."[1049] The definition of darkness within the context of scientific papers ranges from zero to four lux.[1050]

The code of welfare for layer hens includes as a minimum standard that when housed under artificial light, "the light intensity must be raised and lowered gradually over a 15 minute period to give [layer hens] sufficient time to roost and come off perches without causing injury."[1051] In contrast, it is only included as a recommended best practice in relation to meat chickens that lighting "should be dimmed gradually at lights off and increased gradually at lights on, to allow chickens to adjust to different light intensities."[1052] This gradual dimming allows birds to find suitable perches at night; appears to be less stressful than an abrupt transition;[1053] and has been shown to "stimulate feeding behaviour in broilers and laying hens which may prevent food deficit occurring during the night."[1054] As such, it should be included as a mandatory minimum standard in the code, as in the layer hens code of welfare.

Minimum standard 6(a) provides for a training period of four days with sufficient lighting for 23 hours a day to enable chicks to locate feed and drinking areas, with a one hour period of darkness each day to accustom the chickens to blackout conditions. This approach is common internationally, with many farmers providing 24 hour lighting in the first seven days of life so that chicks can find food and water.[1055] However such conditions tend to result in smaller birds, an increased incidence of feather pecking and more birds missing feathers as compared to birds raised in an environment where the heating element is placed in a darkened area that allows the chicks to rest simultaneously and reduces disturbance.[1056] As such, it may be preferable from a welfare perspective to eliminate this minimum standard.

1048 At 5

1049 Code of Welfare (Meat Chickens) 2018 at 26

1050 A number of these papers are summarised in H. H. Kristensen *The effects of light intensity, gradual changes between light and dark and definition of darkness for the behaviour and welfare of broiler chickens, laying hens, pullets and turkeys.* (Norwegian Scientific Committee for Food Safety, 2008).at 31.

1051 Code of Welfare (Layer Hens) 2018, Minimum Standard No 7(f) (Lighting)

1052 Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 6 (Lighting), Recommended Best Practice (a)

1053 Bryant S. L. "A case for dawn and dusk for housed lifestock" (1987) 18 Appl. Anim. Behav. Sci. 379 at 380. Bryant discusses the importance of the dusk and dawn transitions and states "omission of these transition periods is stressful to the animal, especially over the long-term."

1054 Kristensen, above n 1051, at 2

1055 Ministry for Primary Industries, above n 1150, at 13 citing Anne-Marie Gilani, Toby G. Knowles, Christine J. Nicol "The effect of dark brooders on feather pecking in commercial farms" (2012) 142 Appl. Anim. Behav. Sci. 42.

1056 At 13

6.8.2 LUX

The code provides that after the first four days of placement, natural or artificial light intensity should be at least 20 lux at chicken head height,[1057] with best practice being 50 lux.[1058] However, neither of these provisions are mandatory – the requirement for 20 lux at head height is only an example indicator to the minimum standards and the recommendation regarding 50 lux is only a recommended best practice. This is in contrast to the Code of Welfare (Layer Hens) 2018, where it is mandatory that lighting levels during the light phase must be no lower than 20 lux at hen level.[1059]

In its report to the code of welfare for meat chickens, NAWAC set the parameters for lighting intensity at 20 – 50 lux, stating: "due to the lack of scientific information in this area, interim lighting parameters to safeguard the welfare of housed poultry have been established."[1060] This decision was informed by lighting parameters in the UK (10 lux – 20 lux) and in the EU (20 lux). However, there are numerous scientific studies discussing light intensities for broiler chickens that NAWAC did not canvas.

For example, Deep *et al*. stated that low light intensity has been found to lead to "altered behavioural expression, and increased fearfulness of birds",[1061] as well as a range of health issues such as leg disorders and ocular defects. Hughes and Black found that hens were generally more fearful when housed in 17-22 lux than in higher light intensities of 55-80 lux.[1062] SCAHAW references an experiment showing that both broilers and layer hens tested at 2 and 6 weeks at various light intensities (6, 20, 60 and 200 lux) preferred the brightest environment at 2 weeks but the dimmest at 6 weeks for resting and perching. For all other behaviours birds preferred the highest intensity.[1063] Further, Alvino *et al*. found that "broilers reared with high illumination [e.g. 200 lux] had fewer, longer and less interrupted bouts of resting than those reared with moderate or low illumination",[1064] as birds reared with such lighting tended to synchronise their behaviours resulting in less interruptions during the sleeping phase by active birds. As such, the authors concluded that rearing broilers with a high daytime light intensity has "the potential to improve welfare by increasing uninterrupted resting behaviour during the dark phase."[1065] Although NAWAC cited both SCAHAW and Alvino *et al*. in its report, it did not refer to the SCAHAW findings in relation to lighting intensity. While it acknowledged the research by Alvino et al, it considered that its application had not been investigated within the context of lighting levels commonly used in commercial production. This is concerning because whether a standard is commonly used in commercial production is not the test prescribed by the Act.

There has also been research on lighting intensity for broiler chickens subsequent to NAWAC's report. Raccoursier *et al*. found that significantly more broiler chickens prefer a light intensity of 20 lux than 5 lux in areas with food or water, and recommended "a light intensity of at least 20 lux for the areas around the feeders."[1066] However, other studies have found that higher light intensity:[1067]

1057 Code of Welfare (Meat Chickens) 2018, Minimum Standard No 6, Example Indicator
1058 Minimum Standard No. 6, Recommended Best Practice (c)
1059 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 7(d)
1060 National Animal Welfare Advisory Committee, above n 886, at 5
1061 A. Deep, K. Schwean-Lardner, T Crowe, B Fancher, and H Classen "Effect of light intensity on broiler production, processing characteristics, and welfare" (2010) 89 Poult. Sci. J. 2326 at 2326.
1062 Hughes B. O and Black A. J "The Effect of environmental factors on activity, selective behaviour patters and "fear" of fowls in cages and pens" (1974) 15 British Poultry Science 375
1063 Scientific Committee on Animal Health and Animal Welfare, above n 944, at 61
1064 Alvino et al, above n 1047, at 275
1065 At 275
1066 M. Raccoursier, Y Thaxton, K Christensen, D Aldridge "Light intensity preferences of broiler chickens: implications for welfare" (2019) 13 Animal 2857 at 2857.
1067 Deep et al, above n 1062, at 2326

> …has been shown to increase bird activity and aggressive behaviour…but a specific negative effect of higher light intensity within the range of 1 to 100 [lux] has not been scientifically demonstrated in broiler chickens.

Senaratna *et al*. found that early exposure to dim lighting of 5 lux combined with red colour light up to 28 days, followed by exposure to high intensity lighting of 320 lux combined with red colour light "is the most favourable lighting regime for optimizing production, better welfare of broilers and improving health benefits of meat."[1068]

Given the scholarship outlined above, it behoves NAWAC to review the latest scientific information in order to determine appropriate lighting for meat chickens, particularly in light of the fact that it has now been nine years since it published its report to this code citing a lack of scientific information in this area.

6.9 LITTER MANAGEMENT

Minimum standard 9 (Litter Management) provides that litter must be good quality and managed to avoid levels of dustiness or dampness that would be deleterious to meat chicken health.[1069]

Litter is important "to encourage a natural behavioural repertoire and physical activity: dust bathing, scratching and foraging behaviours."[1070] Further, the:[1071]

> …condition of the litter is crucial to the welfare of the meat chickens as it retains the waste solids: too dry and dust can cause respiratory problems, too moist and contact dermatitis, hock burn and viral, bacterial and mycoplasmic infections thrive (Buijs *et al*:, 2009).

Litter that is continuously damp or wet leads to ammonia production, which at high concentrates (greater than 20 ppm) irritates chickens' eyes and respiratory systems. Prolonged contact with wet litter also leads to lesions on chickens' feet, hocks and breast, and to impaired gait and reduced ambulatory activity.[1072] Excessive sitting and poor litter quality also leads to contact dermatitis and ammonia burns on the hocks, feet and breast.[1073] In one New Zealand study, 29% of birds had food pad lesions, 28% had hock burns and 8% of all mortalities resulted from culling for leg problems.[1074]

Unfortunately, minimum standard 9 does not include reference to a number of measures that could contribute to better quality litter and a reduced incidence of contact dermatitis. For example, Haslam *et al*. found that increasing the depth of litter at the end of the flock cycle (e.g. by adding fresh litter); taking measures to reduce bird weight at slaughter (including by slaughtering at an earlier age); feeding meal rather than pelleted food; increasing the percentage of wheat in the diet; and using birds with a certain genotype could assist in reducing hock burn.[1075] And Škrbić *et al*. found that a lower incidence of footpad

1068 D. Senaratna, T.S. Samarakone, and W.W.D.A Gunawardena "Effects of four dim vs high intensity red color light regimens on growth performance and welfare of broilers" (2018) 31 Asian Austral J Anim 149 at 149.
1069 Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 9(a) and (c)
1070 Robins and Phillips, above 898, at 358
1071 At 357
1072 At 359
1073 At 359
1074 Bagshaw et al, above n 120
1075 S.M. Haslam, T.G. Knowles, S.N. Brown, L.J. Wilkins, S.C. Kestin, P.D. Warriss and C.J. Nicole "Factors affecting the prevalence of foot pad dermatitis, hock burn and breast burn in broiler chicken" (2007) 48 British Poultry Science 264.

and hock lesions were found when wood shavings were used as litter and that broilers of Ross 308 genotype developed such issues more frequently compared to Hubbard Classic broilers.[1076]

Minimum standard 9 (Litter Management) further recommends that the:[1077]

> …Industry should establish a cleanliness score scale and footpad dermatitis and hock burn score scales to help producers set 'remedial action' levels which will result in welfare and productivity improvements.

Michael Brooks of PIANZ informed us that the industry has "established a system for footpads" [1078], using what is known as the Scandinavian scoring system (zero for no lesions, one for mild lesions and two for severe lesions). He explained that this is done at the slaughter house, so that "you know which sheds [the chickens] came from, which farms they came from."[1079] The process does not screen for hock burn specifically, as Brooks explained "We look at footpad only as hock burn and footpad would be very similar, and [it's] much easier in a plant setting to have one measure."[1080] However, there is no similar score for cleanliness, which Brooks attributes to the difficulty in "getting an objective, an international objective measure."[1081] This may be problematic in terms of ensuring that the condition of litter is adequate to ensure the physical and health needs of meat chickens.

Other factors affecting hock, foot and breast burn include drinker design; feed composition (e.g. deficiencies in some micronutrients have been shown to increase contact dermatitis); house temperature and relative humidity; floor permeability; and stocking density.[1082] However, none of these factors are recognised throughout the code as contributing to hock, foot and breast burn.

1076 Zdenka Škrbić, Zlatica Pavlovski, Miloš Lukić, Veselin Petričević "Incidence of footpad dermatitis and hock burns in broilers as affected by genotype, lighting program and litter type" (2015) 15 Ann. Anim. Sci.433
1077 Code of Welfare (Meat Chickens) at 15
1078 Interview with Michael Brooks, above n 19
1079 Interview with Michael Brooks
1080 Email from Michael Brooks of PIANZ and EPF to the author, 7 February 2020.
1081 Interview with Michael Brooks, above n 19
1082 As noted in Haslam et al, above n 1076, at 265

6.10 LACK OF A CODE OF WELFARE FOR MEAT CHICKEN BREEDER BIRDS

The Code of Welfare (Meat Chickens) 2012 expressly excluded its application to meat chicken breeder birds, the intention being that these birds would be covered in a future code of welfare for meat chicken breeders. An Animal Welfare (Meat Chicken Breeders) Code of Welfare, intended to address welfare issues in relation to breeding and genetic selection,[1083] was under development in 2010 but was never completed. It is unclear why this is, or why this issue remains unaddressed a decade later.

However, NAWAC has recently informed industry organisations that it does want to put a breeder code of welfare in place. PIANZ has submitted a draft breeder code and submitted this to NAWAC for its feedback.[1084] This will "go on to the formal submission process"[1085] and NAWAC anticipates this will be in force by 2020/2021.[1086]

An important aspect of this code is likely to be selection pressures faced by breeder birds. NAWAC recognised in its 2017 report that selecting for fast growing birds has had a significant impact on the birds that are chosen as breeders and grown through to adulthood. As a result of being bred to grow so quickly, these birds experience obesity, difficulty mating, aggression, high mortality and locomotory problems,[1087] and difficulties reaching sexual maturity.[1088] Currently, the only means of avoiding these problems is to slow down the fast growth rates of breeder birds through providing them with a starvation diet – in some cases as little as 25-50% of what they would normally eat. This has led to breeder birds that are "chronically hungry, frustrated and stressed."[1089]

NAWAC has acknowledged that feed restriction within this context is itself a welfare issues leading to negative animal welfare as a result of "chronic hunger, increased performance of abnormal behaviours, increased pecking at non-food objects, and increased pacing."[1090] The 2017 NAWAC report makes several recommendations to industry on this issue, stating that it strongly encourages "a higher weighting of welfare traits as compared to production traits in genetic selection, including those that reduce the need for food restriction in breeder birds." [1091] It is unclear whether the proposed code of welfare for breeder birds will address these issues.

1083 National Animal Welfare Advisory Committee, above n 886, at 9
1084 Interview with Michael Brooks, above n 19
1085 Interview with Michael Brooks
1086 National Animal Welfare Advisory Committee, above n 324, at 1
1087 National Animal Welfare Advisory Committee, above n 121, at 16
1088 This is outlined in *Compassion in World Farming Limited v The Secretary of State for the Environment, Food and Rural Affairs* CO/1779/2003 at [16].
1089 At 16]
1090 National Animal Welfare Advisory Committee, above n 121, 16
1091 At 16

6.11 MORTALITY

Mortality rates are mentioned at minimum standard 14 (Management of Health and Injury), which requires that where "mortality level within a shed exceeds 1% in a 24 hour period… the cause must be investigated and remedial action taken promptly."[1092] It is similarly an example indicator at minimum standard 2 (Food and Water) that if the mortality level within a shed exceeds 1% in a 24-hour period, an investigation is undertaken and documented.[1093]

However, animal welfare organisations have criticised the rate at which meat chickens die, with approximately 7,000 meat chickens dying prematurely in New Zealand daily. Hans Kriek of SAFE stated that this does not fulfil the obligations outlined in the Act to ensure the protection from and rapid diagnosis of any significant injury or disease.[1094] Concerns regarding mortality rates have also surfaced in recent years in part due to controversial footage at meat chicken farms showing dead bird carcasses lying among living birds in the sheds in which they are kept. For example, images taken at a Tegel farm in Helensville in 2018 shocked the public and were declared 'shockingly normal.'[1095]

Michael Brooks of PIANZ confirmed that approximately 6,700 meat chickens die per day in New Zealand based on a 2.5% mortality rate.[1096] However, he argued that New Zealand has "world-leading standards… our average mortality is about 2%"[1097] – as compared to 5% overseas. Brooks asserted that one of the reasons for this is that New Zealand is free of the three major poultry diseases, being bird flu, Newcastle disease and infectious bursal disease (although there was an outbreak of infectious bursal disease at Mainland's Waikouaiti farm in 2019).[1098]

The mortality rates of 5% overseas cited by Brooks is not absolute. While the larger European Union broiler companies have a mortality rate of approximately 5%,[1099] De Jong *et al*. (2011) found a mortality rate of 2.9% among 180 meat chicken companies in Europe.[1100] In addition, the code itself outlines that where mortality levels are above 1% this has to be investigated and addressed.

Thus, there may be room for improvement in this area. Mortality in meat chickens may be reduced through the codes of welfare and/or regulations by introducing some of the measures we have already discussed, including having lower stocking densities; addressing issues associated with temperature and ventilation; the implementation of less stressful catching techniques; providing chickens with access to the outdoors; providing for the behavioural needs of meat chickens; and addressing issues associated with fast growth rates. Such measures would assist in reducing mortality rates to at or below the benchmark suggested by the code of 1%.

1092 Code of Welfare (Meat Chickens) 2018, Minimum Standard No 14(d)

1093 Minimum Standard No. 2, Example Indicator

1094 SAFE, above n 895. This requirement is included in the definition of physical, health and behavioural needs which those in charge of animals are required to ensure, outlined at s 4 of the Animal Welfare Act 1999.

1095 Julie Iles "Conditions at Tegel chicken farm shockingly normal, as video of 'deformed' chicks surfaces" *Stuff* (online ed, New Zealand, 30 July 2018)

1096 Email From Michael Brooks of PIANZ and EPF to the author, 7 February 2020

1097 Interview with Michael Brooks, above n 19

1098 Interview with Michael Brook. Brooks further stated: "… fundamentally we haven't had that disease or those diseases and therefore we have to do far less vaccinations. For example, here we do about two vaccinations for meat chickens – in the United Kingdom they'd do 18 vaccinations… so we have much lower levels and need for vaccination, which leads to better protein conversion, which leads to better, healthier birds."

1099 de Jong et al, above n 954

1100 De Jong I.C., Perez Moy T., Gunnink H., Van den Heuvel H., Hindle V., Mul M., Van Reenen C.G., *Simplifying the Welfare Quality assessment protocol for broilers* (Livestock Research Wageningen UR, Report 533, 2011) at 16. "The majority of the data were collected in 2011 in Dutch broiler flocks, but more recent Belgian data alongside data from UK, Italian and Dutch farms were included in the analysis."

“[COLONY CAGES]… [FORCE LAYER HENS] TO LIVE IN UNNATURAL CONDITIONS, AWAY FROM THEIR OUTDOOR HABITAT AND UNABLE TO MOVE FREELY AND INTERACT NORMALLY WITH EACH OTHER.”

EXTRACT FROM PAGE 186

CHAPTER 7 - CODE OF WELFARE (LAYER HENS) 2018

7.1 OVERVIEW

The New Zealand egg industry consists of about 162 egg farms.[1101] There are about 3.6 million egg-laying hens in New Zealand,[1102] with the industry expected to produce about 955.7 million eggs during 2019 – 2020.[1103] At present, New Zealand produces its own supply of eggs and does not import any from overseas.[1104]

The Code of Welfare (Layer Hens) 2018 provides for minimum standards in relation to the farming of meat chickens. We analysed the code through conducting a peer review of the research that would have been available to NAWAC when it first reviewed the code in 2012; by reviewing the literature that has subsequently become available since 2012; by reviewing literature relevant to the 2013 and 2018 amendments to the code; and by reviewing NAWAC's 2012 report on the layer hen code of welfare.[1105] We also reviewed the regulations relevant to layer hens in the Animal Welfare (Care and Procedures) Regulations 2018.

We found issues in relation to the following areas:

- **Timeframe for Phasing Out Battery Cages:** We are critical of the timeframe for phasing out battery cages. This extended timeframe means that these cages are still in use nearly two decades after NAWAC's acknowledgment that battery cages do not meet the requirements of the Act. At present, battery cages are still the most commonly used system in New Zealand.[1106]
- **Use of Colony Cages:** The continued use of colony cages is also highly problematic, as these cages provide only 200 cm^2 more space per hen than the battery cages that preceded them. This spatial limitation frustrates many of the layer hen's normal behaviours and leads to physical and health problems. In addition, the artificial enhancements provided in these cages do not adequately meet the behavioural needs of layer hens, with only one secluded nesting area and one scratching area expected to be shared between 60 birds; perches being of inadequate design; and artificial enhancements not provided in relation to a range of behaviours such as dust bathing and foraging. There are alternatives to such systems, but these have never been adequately considered by NAWAC. Additionally, public opinion seeking a total ban of all cages was not adequately considered by NAWAC.
- **Stocking Densities:** Stocking densities are an issue in relation to both colony cages and barn-raised hens. First, stocking densities remain intensive for caged hens, with birds being stocked at 13 hens per m^2. Secondly, the stocking densities of seven hens per m^2 for hens in barn systems and nine hens per m^2 for hens in barn system with outdoor access were not based on a thorough examination of the science, with no scientific literature being referenced by NAWAC in justifying its decision to set these parameters. In addition, while the code provides that stocking of the outdoor ranging area must not exceed 2,500 hens per hectare in barn systems, NAWAC has subsequently stated in its own meeting minutes that stocking in this environment can be as large as 4,000 birds per hectare – despite the fact

1101 As of December 2018, according to Egg Producers Federation of New Zealand: Letter from Michael Guthrie, (Chairman of the Egg Producers Federation of New Zealand) to Minister of Agriculture regarding the cage transition report (27 November 2018)
1102 Gerald Hutching, "New rules on hen cages and rising feed costs lift egg prices" *Stuff* (online ed, New Zealand, 16 January 2019)
1103 "Drop in egg production expected to continue" *NZ Herald* (Online ed, Auckland, 20 June 2019).
1104 Hutching, above n 1103
1105 National Animal Welfare Advisory Committee *Animal Welfare (Layer Hens) Code of Welfare Report* (29 June 2012)
1106 Michael Guthrie, above n 1102

that this is not provided for in the code or regulations. The code and regulations also doe not require shelter to be provided such that layer hens will actually use the outdoor range when it is available to them (e.g. there are no minimum standards requiring the provision of trees, shrubs or other shelter where an outdoor range is provided). In addition, no stocking densities have been provided for in relation to free-range farms.

- **Ensuring the Behavioural Needs of Layer Hens:** The code of welfare and regulations do not adequately ensure the behavioural needs of layer hens, including behaviours such as preening, wing flapping, head shaking, tail wagging, feather ruffling, beak wiping, unilateral wing-leg stretching and avoiding predators. It also does not ensure access to environmental enrichment that would facilitate the expression of these behaviours. NAWAC justified its approach by distinguishing between behaviours that are "essential" and "non-essential" for layer hens to express – however, this not the test under the Act and NAWAC's approach has been critiqued by the Regulations Review Committee as failing to clearly articulate how its decision meets the requirements of the Act.
- **Ventilation**: The code is remiss in permitting levels of ammonia that are proven to be detrimental to the health of layer hens. The code should be revised to permit levels only as high as 10 ppm – the code currently allows double this amount. It is also not a requirement of the code or regulations that these levels be measured and monitored by farmers.[1107]
- **Lighting:** Lighting in indoor environments is in need of re-consideration, with a range of scientific literature suggesting that the current standard of 20 – 50 lux may be inadequate.
- **Catching:** Catching techniques for meat chickens are in need of improvement. Currently, four chickens can be caught in each hand of a catcher at any one time and held in an inverted position. This method leads to heightened stress and fear in meat chickens and subsequent studies since NAWAC's report on the code have revealed alternative methods may be better for animal welfare, such as holding birds under the abdomen in an upright position; putting birds into crates gently and one at a time; and/or utilising a conveyor belt system.

- **Beak Trimming**: The painful procedure of beak trimming (otherwise known as 'beak tipping') should be disallowed, with alternative means for reducing injurious pecking instituted e.g. lower stocking densities; early identification and removal of chickens exhibiting this behaviour; and facilitating opportunities to forage and for chickens to peck at alternative substances.
- **Maceration and Gassing of Male Chicks:** The live maceration and gassing of male chicks should be prevented through the use of new technologies enabling farmers to determine the gender of a chicken embryo in an egg prior to hatching. Currently, approximately three million chicks are destroyed through being gassed or macerated every year. The code of welfare and regulations may also need to be amended to ensure that these chicks die humanely.
- **Selective Breeding of Layer Hens**: The selective breeding of layer hens for high egg-yield has led to a number of behavioural and health issues, including increased feather pecking and aggression; higher risk of bone fractures; calcium deficiencies; increased incidence of osteoporosis; and other health conditions such as cloacal prolapse, salpingitis and tumours. Means for mitigating or eliminating these welfare concerns as a result of selective breeding should be incorporated into the code of welfare and/or regulations.

1107 This is only a recommended best practice. Code of Welfare (Layer Hens) 2018, Minimum Standard No. 8 (Ventilation), Recommended Best Practice (a) states "Air quality parameters, such as ammonia levels, should be monitored and recorded on a weekly basis."

We note that some positive legislative changes have taken place recently in regards to layer hens. For example, regulation 22 of the Animal Welfare (Care and Procedures) Regulations 2018 prohibits induced moulting (the practice of artificially provoking a flock to moult simultaneously through feed restriction).[1108] Regulation 21 also provides that battery cages are to be sequentially phased out depending on the date they were installed, and prohibited entirely by the 1 January 2023. However, as stated there are still numerous issues associated with how these animals are farmed in both colony cages and barn-raised systems.

NAWAC has announced that the Code of Welfare (Layer Hens) 2018 will be reviewed.[1109] This is to be undertaken in 2019 – 2021, as outlined in NAWAC's work programme.[1110]

7.2 HOUSING SYSTEMS

The housing systems that are currently in use in relation to layer hens are as follows:

- Battery cages: Otherwise known as 'conventional cages', these cages do not have perches, nest areas or other forms of enrichment. Birds in these cages are required to have a minimum of 550 cm^2 per bird.
- Colony cages: Birds in these cages must be provided with a minimum of 750 cm^2 per bird. The code requires these types of cages to have a number of 'artificial enhancements' including perches and a secluded nesting area.
- Barns: Hens raised in barns must not exceed seven hens per m^2 where there is no access to the outdoors; nine hens per m^2 for barns with outdoor access; and stocking of the outdoor ranging area must not exceed 2,500 hens per hectare.

7.3 CONVENTIONAL (BATTERY) CAGES

The Code of Welfare (Layer Hens) 2012 revoked the former Code of Welfare (Layer Hens) 2005 and banned the construction of new conventional (battery) cages, subject to a phase-out for all such cages by 2022. This was reinforced by regulation 21 of the Animal Welfare (Care and Procedures) Regulations 2018, which also provided for the phased elimination of conventional cages, with a further extension of a year for cage systems installed after 31 December 2001 but before 7 December 2012. Despite this, battery cages currently account for 44.7% of egg production, or 1,639,046 of layer hens in total.[1111] At present "the remaining eggs are being farmed in colony cage systems (24.7%), barns and free-range (30.6%). Organic eggs make up around 1%."[1112]

Michael Brooks of EPF stated that the timeframe outlined in the Code of Welfare (Layer Hens) 2012:[1113]

1108 RSPCA "What is induced moulting of layer hens?" (27 September 2019) < www.rspca.org.au>.

1109 Interview with Michael Brooks, above n 19. National Animal Welfare Advisory Committee, above n 890, and National Animal Welfare Advisory Committee, above n 542

1110 National Animal Welfare Advisory Committee, above n 542, at 1

1111 Ministry for Primary Industries (9 July 2019) <www.mpi.govt.nz> response to letter from Michael Guthrie, (Chairman of the Egg Producers Federation of New Zealand Inc.) to Minister of Agriculture regarding the cage transition report re Section 21 of the Animal Welfare (Care and Procedures) Regulations 2018 (27 November 2018).

1112 "Egg farming in New Zealand: Feeding a nation of egg-lovers," Egg Producers Federation of New Zealand, <www.eggfarmers.org.nz>.

1113 Interview with Michael Brooks, above n 19

> …was extraordinarily short – it was half what was given to farmers in Europe. In Europe they were given 13 years and in New Zealand a fair whack of the industry was given 6 years…6 years has been extraordinarily tough, so we were extremely unhappy with that code…But that time frame, you live with it on the basis that overall you think it's a fair system.

However, although New Zealand's phase-out period is shorter when compared to the European Union, this is not surprising in circumstances where it lags a decade behind the EU in terms of implementation date. The EU required that battery cages be eliminated from 1 January 2012 (EU Directive 1999/74/EC). Switzerland, Sweden, Austria and Germany had already ceased using these cages in 1992, 2002, 2008 and 2009, respectively.[1114] In comparison to these countries, New Zealand has taken some time to implement the phase-out of battery cages, which are highly restrictive and prohibitive for layer hens in terms of exhibiting their normal behaviours, with the total ban only taking effect in 2023. In effect the continued use of these cages has been permitted for 22 years since the Act came into force; "nearly two decades after NAWAC's admission [in its report to the code of welfare] that these systems do not fulfil the requirements of the Act";[1115] and 16 years since the Regulations Review Committee (**RRC**) found (in response to a complaint by the Animal Rights Legal Advocacy Network) that the current law was being breached and that battery cages should be phased out.[1116]

It appears that this phase-out period gave little weight to public opinion, with a 2011 Horizon survey finding that 85% of New Zealanders wanted the Government to phase out cages within five years.[1117] Duffield has noted that the timeframe would also have been consistent with the time frame applied to the 2010 ban on sow stalls for pigs.[1118]

Michael Brooks noted the lack of support to farmers from the Government in making this transition, with about 34 – 40 farms impacted at a cost of approximately $1 million each. Brooks stated there was no financial support from the Government to assist with this transition, with producers "asked to do a lot at their own cost."[1119] However, in its report to the code of welfare NAWAC noted that much of these costs could be passed on to consumers. NAWAC considered that the demand for eggs is likely to be relatively inelastic as they are an important source of protein; they have few ideal substitutes; and they constitute a small proportion of the overall food budget for consumers.[1120] Thus, NAWAC stated that the estimated annual increase in costs in the long term would be between 10-14% with this increase "likely to be reflected in a corresponding increase in the costs of eggs to consumers."[1121] Notably, New Zealand based egg producers also do not have to compete with international imports from countries that have lower animal welfare standards and thus cheaper products.

1114 National Animal Welfare Advisory Committee, above n 1106, at 8
1115 Duffield, above n 273, at 237
1116 *Final Report on the Complaint About Animal Welfare (Layer Hens) Code of Welfare 2005: Report of the Regulations Review Committee* (New Zealand Parliament, I.16A, 9 May 2006).
1117 Horizon Poll, above n 274
1118 Duffield, above n 273, at 237
1119 Interview with Michael Brooks, above n 19
1120 National Animal Welfare Advisory Committee, above n 1106, at 13
1121 At 13

7.4 COLONY CAGES

The code of welfare permits the use of colony cages at minimum standard 4 (Housing and Equipment Design, Construction and Maintenance) and minimum standard 6 (Stocking Densities). Minimum standard 6 provides that colony cages must provide a minimum of 750 cm^2 of space her bird (or 13 hens per m^2).[1122] Minimum standard 4 provides that in a colony cage a secluded nest area must be provided; that the floor of the nest area must be covered with a suitable substrate that prevents direct contact of hens with the wire mesh floor; that the floor slope must not exceed 8 degrees; that the colony cage height must be at least 45 cm other than in the nest area; that perches must be provided and designed to allow the hen to grip without risk of trapping its claws and must provide at least 15 cm of space her hen to allow all hens to perch at the same time; that a scratching area must be provided; and that suitable claw shortening devices must be fitted.[1123]

The science suggests that the continued use of colony cages remains problematic. The code defines colony cages as a "modified and enlarged enclosure with more space than [conventional] cages and with perching, nesting and scratching areas."[1124] In fact, colony cages are only slightly larger than the conventional cages that have been banned - instead of living within an area of 550 cm^2, hens have an extra 200 cm^2 and will live their lives on an area that is 750 cm^2 in size[1125] (still only slightly larger than an A4 piece of paper, being 623.4 cm^2). This marginal increase in space fails to substantively address the principal issues associated with conventional/battery cages, including that they "[force] the birds to live in unnatural conditions, away from their outdoor habitat and unable to move freely and interact normally with each other."[1126] Studies have shown that group-housed hens:[1127]

> …require an average of approximately 475 cm^2 for standing, 540-1005 cm^2 for scratching, 771-1377 cm^2 for turning, 652-1118 cm^2 for wing stretching, 860-1980 cm^2 for wing flapping, 676-1604 cm^2 for feather ruffling and 814-1270 cm^2 for preening.

In battery and colony cages, hens cannot run, jump, spread their wings,[1128] access daylight, preen or sunbathe.[1129] Similarly, the limited nature of the cage environment frustrates hens' urge to explore and forage.[1130] While the code includes as a recommended best practice that hens have enough vertical and horizontal space available to stretch to their full height and flap their wings,[1131] this is not a minimum

1122 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 6 (Stocking Densities)
1123 Minimum Standard No. 4 (Housing and Equipment Design, Construction and Maintenance), Colony Cages: (i) – (vi)
1124 Schedule 1
1125 This calculation is based on the provision in Minimum Standard 6(i) (Stocking Densities) which provides that hens in colony cages must be stocked at one hen per 750 square cm or 13 hens per m2.
1126 Duffield, above n 273, at 236
1127 Poultry Standards and Guidelines Drafting Group *Poultry Welfare Standards and Guidelines – Layer Hen Cages, Supporting Paper Public Consultation Version* (October 2016) at 3
1128 This was also noted in my interview with Hans Kriek. Interview with Hans Kriek, above n 15
1129 Duffield, above n 273, at 236
1130 Hartcher and Jones, above n 195, at 776
1131 Code of Welfare (Layer Hens) 2018, Minimum Standard No 4 (Housing and Equipment Design, Construction and Maintenance), Recommended Best Practice (b)

standard and therefore not a requirement in the code. NAWAC justified this approach in part by stating that the colony cage provides extra space when compared with battery cages as a result of the increase in the number of birds housed together:[1132]

> For any given housing density in any system, the more birds in the colony, the greater the free space (Cook et al., 2011). Layer hens tend to group together in any given area, thus leaving areas of space in which any bird can leave the group to perform behavioural requirements such as wing stretching, preening or dust bathing. As these behaviours are performed relatively infrequently, the birds in this way are able to meet their behavioural needs.

NAWAC only cited one study in support of this proposition, being Cook et al.[1133] However, the study mentioned this point only briefly and was actually focussed on the use of enrichments in the colony cage. The study also noted that increasing the number of birds in a group came with its own issues, such as heightened aggression:[1134]

> …as the size of the colony increases there is growing impact of social order within the group leading to a higher incidence of aggression. Thus, as the size of the colony increases there is a trade-off between increasing free space per hen and the likelihood of experiencing aggression.

The inability of hens to exercise in confined cages leads to bone fragility and conditions such as disuse osteoporosis, muscle weakness and fractures.[1135] This was acknowledged by NAWAC in its report to the code.[1136] Lack of exercise can also lead to metabolic disorders such as fatty liver, which can cause rupture of the liver and sudden death. [1137] In contrast, hens raised in cage-free systems have much better musculoskeletal health and less incidences of osteoporosis and fractures due to the freedom they have to walk, run, perch, flap their wings and fly (although these hens are at a greater risk of bone fractures from falling or sustaining injuries during flight on objects such as perches, feeders, drinkers or nest boxes).[1138] Further, the inability of hens to adequately express behaviours such as perching, nesting (in a discrete nest site)[1139] and dust bathing results in frustration and emotional distress, as evidenced by stereotypic pacing, feather pecking, hysteria and cloacal cannibalism.[1140]

1132 National Animal Welfare Advisory Committee, above n 1106, at 16

1133 N.J. Cook, A.L. Schaefer, D.R. Korver, D.B. Haley, J.J.R. Feddes, J.S. Church “Minimally-Invasive Assessments of the Behavioural and Physiological Effects of Enriched Colony Cages on Laying Hens” (2011) 5 Open Agric. 10.

1134 Cook et al, above n 1134

1135 Hartcher and Jones, above n 195, at 770

1136 National Animal Welfare Advisory Committee, above n 1106, at 12

1137 Hartcher and Jones, above n 195, at 771 – 772

1138 At 770

1139 At 774: “The majority of layer hens prefer to lay their eggs in a discrete nest site (Appleby et al., 2002; Weeks and Nicol, 2006; Cronin et al., 2012), and the strength of the motivation to access a nest box has been demonstrated in a number of different ways. Cooper and Appleby (2003) concluded that hens’ work-rate to access a nest 20 minutes prior to egg- laying, as measured by the extent to which they were willing to work by pushing a push- door for resources, was twice the work-rate to access food after four hours of confinement without feed. Similarly, Zimmerman et al. (2000) found that hens exhibited greater frustration when a nest was denied than feed and water deprivation. Hens which were denied an appropriate nest site at oviposition expressed frustration through specific, gakel call vocalisations.”

1140 At 773 and 775

7.4.1 ARTIFICIAL ENHANCEMENTS IN THE COLONY CAGE

7.4.1.1 SECLUDED NESTING AREAS

Minimum standard 4 (Housing and Equipment Design, Construction and Maintenance) does provide for a range of artificial enhancements intended to facilitate the expression of normal behaviours in colony cages. These include "facilities for roosting (e.g. perches), a surface for pecking and scratching, and a secluded nesting area."[1141] The code also requires a suitable substrate that prevents direct contact of hens with the wire mesh floor; perches; a scratching area; and suitable claw shortening devices.[1142] However, commentators have questioned the efficacy of such enhancements in enabling birds to express their normal patterns of behaviour. Duffield stated:[1143]

> For instance, hens tend to perform activities such as nesting at the same time of day, making it crucial that a large number of enhancements are provided. Yet, whilst Minimum Standard 4 requires that a secluded nesting area be provided, there is no stipulation as to how many of these must be provided in colony cages or any minimum space requirement. Accordingly, a farm could provide one small, token nesting area for 90 hens, and this would meet the requirements of the Code — despite this clearly falling short of meeting the hens' welfare…Similarly, whilst Minimum Standard No 4 requires that "a scratching area must be provided", there is no requirement that this be of any particular size within the colony cages or that it be made from appropriate material. Consequently, these enhancements appear unlikely to provide any real improvement to hen welfare.

Michael Brooks of EPF confirmed that there is "one scratching area and one nesting area [per colony cage]."[1144] Thus, a single scratching area and nesting area are shared between up to 60 birds.[1145]

Hans Kriek of SAFE stated:[1146]

> …when you go into a farm you see that a scratching pad is a piece of rubber for 60 birds – it's nothing, they barely use it. When you look at the nest box, it's a couple of flaps hanging in the corner of the cage – no nesting materials, still just on a sloping wire floor.

7.4.1.2 PERCHES

Perches are well used by hens when present (e.g. for roosting at night time) and have been shown to improve bone strength.[1147] However, "their position, size and shape are crucial to optimize use and avoid landing failures, which can cause broken

1141 Code of Welfare (Layer Hens) 2018, Minimum Standard No 4(f)
1142 Minimum Standard No 4 (i) – (vi)
1143 Duffield, above n 273, at 236
1144 Email from Michael Brooks (Executive Director of PIANZ and EPF) to the author in response to the question "In regards to layer hens, I just wanted to confirm how many scratching areas and nesting areas are available in your average colony cage in New Zealand?" (7 February 2020).
1145 "The Colony Cage Environment," Egg Producers Federation of New Zealand, <www.eggfarmers.org.nz>.
1146 Interview with Hans Kriek, above n 15
1147 Poultry Standards and Guidelines Drafting Group, above n 1128, at 6

bones and keel bone deviation, and to minimize cracked eggs."[1148] It has been shown that the provision of aerial perches leads to a reduction in aggressive behaviour in layer hens; causes hens to be less fearful of humans; to exhibit less resistance when handled; reduces the incidence of feather pecking; and leads to increases in body weight and body condition score.[1149] However the code only provides that perches:[1150]

> …must be provided and designed to allow the hen to grip without risk of trapping its claws and must provide at least 15 cm of space per hen to allow all birds to perch at the same time.

The code also advises against the use of aerial perches "as they are associated with a very high incidence of keel fractures."[1151]

SAFE has contended that while the provision of perches is a meaningful change, as birds can sleep on them at night and will use them during the day, those perches can also be an obstacle. Hans Kriek stated:[1152]

> …because you're talking about an extremely cramped environment with 60 birds in a cage…[with] about a A4 piece of paper each…They're actually an irritation for those animals because they can't move around because of those perches.

Kriek also expressed concern that birds can get trapped under the perches and die as a result.[1153]

7.4.1.3 DUST BATHING AND FORAGING

No enhancements are provided to facilitate dust bathing or foraging behaviours. These behaviours serve important functions for layer hens. For example, dust bathing enables birds to clean their features; remove skin parasites; regulate feather lipids; and maintain plumage.[1154] While facilitating dust bathing behaviours is provided for at minimum standard 12(a), there is no requirement that hens in colony cages be provided with any litter with which to forage, or to use as dust bathing material. This is in contrast to barn-raised hens, which must be provided with good-quality litter to allow them to scratch and forage.[1155] NAWAC justified the decision to differentiate between colony cages and barns as regards the provision of litter in the following way:[1156]

> Debate around the ability of sham dust bathing to satisfy a birds' motivation to dust bathe is ongoing. At the present time, due to the lack of conclusive scientific evidence, it is difficult to reach a conclusion on how important litter is to enable dust bathing in hens. Certainly, the presence of foraging material, which is provided within the scratching area of colony cages on a daily basis, enables the hens to perform dust bathing behaviour in this system. As a result, NAWAC considers that the presence of a scratching area in colony cages is sufficient for hens to perform dust bathing behaviour and that colony cages therefore meet the birds behavioural need to exhibit this behaviour. In non-cage systems, the provision of adequate litter material in which birds are able to perform

1148 At 6
1149 Ministry for Primary Industries, "Welfare Pulse," Issue 13, March 2013 at 13, citing C.J Donaldson and N. E O'Connell, "Aerial Perches for Free Range Hens" (2012) 142 Appl. Anim. Behav. Sci. 51
1150 Code of Welfare (Layer Hens) 2018, Minimum Standard No 4 (Housing and Equipment Design, Construction and Maintenance), Colony Cages (iv)
1151 Minimum Standard No 4 (Housing and Equipment Design, Construction and Maintenance), Recommended Best Practice (e)
1152 Interview with Hans Kriek, above n 15
1153 Interview with Hans Kriek
1154 Hartcher and Jones, above n 195, at 775
1155 Code of Welfare (Layer Hens) 2018, Minimum Standard No 4 (Housing and Equipment Design, Construction and Maintenance), Barns (viii)
1156 National Animal Welfare Advisory Committee, above n 1106, at 11

> their full range of dust bathing related behaviour is a simpler task. NAWAC therefore considers that hens housed in non-cage systems need to be provided with daily access to litter and has added a minimum standard to reflect this.

This is concerning, given the limited nature of scratching facilities provided within colony cage systems discussed at section 7.4.1.1, and in light of NAWAC's recognition that "A large number of public submissions stated concern over the ability of birds to perform dust bathing behaviour in each of the housing systems, and in colony systems in particular."[1157] Additionally, access to litter may have other important functions – for example, it has been shown that when litter is provided during rearing this reduces fearfulness in adult laying hens in circumstances where those hens lack enrichment as adults (as in conventional cage systems).[1158] This may lead to fewer exaggerated fear-reactions such as injurious flying, smothering, feather pecking and more.[1159] Despite this, farmers are not required to provide layer hens in colony cages with litter.

7.4.2 THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE'S JUSTIFICATION FOR THE USE OF COLONY CAGES

NAWAC further justified the use of cages through citing benefits to animal welfare, such as the "ability to maintain close control of the environment that [the hens live in]."[1160] It also referred to:[1161]

> …low production costs, high production yields, good egg quality and good repeatability between batches. Hens sustain a good level of physical health in conventional systems, as cannibalism is uncommon due to stable social order in a small group of birds and 'serial pecking' is less common as these birds do not have access to a large number of other hens. Hygiene is good in cage systems, dust and ammonia levels are easy to control and birds usually show no evidence of parasitism. As a result, the level of medical treatment required for hens in cage systems is low, as is mortality (EC, 2004c).

Other studies have shown that "[transition] from cages to aviaries and barns bears increased risk for feather pecking and cannibalism (Sherwin et al., 2010; Lambton et al., 2010; 2015)"[1162] especially where birds are not beak trimmed, while some commentators have linked higher rates of disease, mortality and bone fractures to non-cage systems.[1163] Dr Christine Nicol identified that damage from feather pecking is usually greater in non-cage systems as pecking birds can reach many more victims in a non-cage system, leading to a faster and more far-reaching spread of this issue. Additionally, such birds can be difficult to identify in a large loose-housed flock.[1164] She refers to other negatives associated with loose housing including increased risk of smothering under other birds leading to suffocation; an increased risk of bone fractures due to birds colliding with objects within the house; and the uneven distribution of birds in the house leading to focal points for competition and persecuted birds hiding in unsuitable areas such as slatted areas beneath tiers of perches and rarely venturing out for food or water.[1165] Michael Brooks of EPF stated:

1157 At 10
1158 M Brantsæter and others, "Access to litter during rearing and environmental enrichment during production reduce fearfulness in adult laying hens" (2017) 189 Appl. Anim. Behav. Sci. 49 at 49
1159 At 49
1160 National Animal Welfare Advisory Committee, above n 1106, at 15
1161 At 12
1162 Bessei W, "Impact of Animal Welfare on Worldwide Poultry Production" (2018) 74 World Poult Sci J 211 at 219
1163 Hartcher and Jones, above n 195
1164 C Nicol *The Behavioural Biology of Chickens* (2015, CABI Publishing) at 168
1165 At 168 - 169

Colonies attempted to be a balance to allow primary behaviours to be undertaken, but they're certainly not the major expression of all natural behaviours. But they still maintain those advantages [in relation to disease control] and mortality.[1166]

A number of the supposed benefits associated with cage systems by NAWAC and others above are more concerned with production, cost and ease of management than with welfare specifically. Additionally, where non-caged systems are associated with welfare issues there are many ways to mitigate these so as to ensure that the health, physical *and* behavioural needs of layer hens are met. For example, the risk of infectious diseases in non-caged systems can be significantly mitigated by good health and hygiene practices and "by proactive approaches such as biosecurity and vaccination programmes."[1167] Additionally, while less intensive systems may present difficulties in terms of preventing disease, "once a disease enters an intensive farm, transmission of disease may be hard to control due to high animal densities."[1168]

Severe feather pecking has also been documented in all types of housing systems and there are a range of ways to mitigate this, including the provision of adequate nutrition; appropriate feed for high-fibre diets; suitable litter; a consistent diet and environment; minimising fear and stress through environmental enrichment; appropriate rearing conditions; good husbandry; matching rearing and laying environments; and genetically selecting for non-pecking birds.[1169] Dr Christine Nicol has also recognised that "Aggressive behaviour is not generally a significant problem in non-cage systems, with infrequent occurrences of actual fights, and no greater risk of aggressive pecking than in-caged systems"[1170] and that aggression can be further minimised by good housing design.[1171] Fernyhough *et al*. reinforced these findings, stating that there are numerous intervention and prevention methods to manage injurious pecking and cannibalism including environmental enrichment; reduced stocking densities; good management (e.g. removing the pecker and/or victim from the flock and noticing the first signs of the pecking problem early on in order to take action before the problem rapidly spreads);[1172] and genetic improvements.[1173] NAWAC acknowledged in its report to the code that several studies have shown that the use of an outdoor run by hens reduces the incidence of feather pecking.[1174] Further, Shields and Duncan noted that suffocation is a "relatively infrequent event, and precautions such as subdivision of the flock can prevent this event altogether."[1175]

Fractures may similarly be addressed through "good design, placement and management of structures in the shed,"[1176] as well as through genetic selection.[1177]

1166 Interview with Michael Brooks, above n 19

1167 Hartcher and Jones, above n 195, at 771

1168 W Boersma, J Van der Meulen and T Niewold "Balance Between Porcine Disease and Welfare" in Marchant-Forde Jeremy N. (ed) *The Welfare of Pigs* (Springer, USA, 2009) 237 at 238

1169 Hartcher and Jones, above n 195, at 772; and E Kaukonen and A Valros "Feather Pecking and Cannibalism in Non-Beak-Trimmed Laying Hen Flocks-Farmers' Perspectives" (2019) 9(2) Animals 11 at 11-14

1170 Nicol, above n 1165, at 168

1171 "Aggression can also be localized at points of resource competition (e.g. just outside nest boxes…) and so house designs that minimize local crowding will generally be beneficial." At 168

1172 The importance of stockmanship in this respect is also referenced in Kaukonen and Valros, above n 1170, at 13

1173 In particular, the authors noted that white hybrids generally demonstrated reduced injurious pecking behaviour and recommended that genetic selection be used to improve welfare overall. M Fernyhough, and others, "The Ethics of Laying Hen Genetics" (2020) 33 J Agr Environ Ethic 15 at 15

1174 National Animal Welfare Advisory Committee, above n 1106, at 18

1175 Sara Shields and Ian J.H. Duncan "A Comparison of the Welfare of Hens in Battery Cages and Alternative Systems" (2009) The Humane Society Institute for Science and Policy Animal Studies Repository, at 10.

1176 Hartcher and Jones, above n 195, at 777

1177 At 777

7.4.3 ALTERNATIVES TO COLONY CAGES

There is some discussion in the NAWAC report on non-cage systems. However, NAWAC identified significant issues with these:[1178]

> …non-cage systems (both those with and without outdoor access) are associated with higher indoor levels of ammonia and dust and disease than cage systems. There is also a greater risk of smothering and outbreaks of injurious pecking than in cage systems, which, if left uncontrolled, can be hugely detrimental to birds' welfare (Richards et al., 2012). Maintenance of the range in systems with access to the outdoors requires careful management, especially in wetter weather. Non-cage systems have advantages in terms of the bird's ability to express normal behaviour, but the risks to the bird's health in these systems are higher. Excellent stockmanship skills are required to maintain all birds' welfare at a satisfactory level in non-cage systems.

However, no economic analysis was conducted by NAWAC of these alternative systems. As Duffield has stated:[1179]

> …despite widespread public opposition to caged systems, it appears that no serious consideration was given to loose housing systems. For instance, producers were not surveyed on this option and no economic analysis was conducted on it (NAWAC "Consultation on Draft Animal Welfare (Layer Hen) Code of Welfare and Draft Economic Analysis" (February 2011) at 5). Such an omission calls for scrutiny: when public opinion is an express statutory consideration, and this overwhelmingly favours cage-free systems, it is inadequate for NAWAC to merely state that the cost of cage-free systems is "expected to be much higher than any of the above options owing to additional running and capital costs" and dismiss it on this basis, without actually conducting any economic analysis on the matter. Rather, the author considers that the requirement of "good practice" presupposes fair and balanced analysis of all alternative housing systems.

NAWAC also considered a minimal number of sources in reaching its conclusions on caged systems and their alternatives. For example, it cited only one study in support of its findings on the negative impacts of non-cage systems in its report on the layer hens code of welfare[1180] and cited only one study to support its finding that birds in non-cage systems have a higher rate of keel damage (at the same time as citing a study in support of the fact that keel damage is a significant issue in all systems).[1181]

New Zealand sits in contrast to countries such as Switzerland where all cages have been banned since 1992; Austria, where colony cages will be banned by 2020; and Belgium, where it is proposed that colony cages be banned by 2024.[1182] Similarly, in Germany "most egg producers have replaced conventional cages with barn, aviary or free-range systems."[1183] California, Michigan, Oregon and Washington have established bans on the use of cages from 2022, 2024, 2024 and 2023, respectively. Their bans include the sale of products from out of state produced using caged systems.[1184] It is striking that the New Zealand code permits practices that major jurisdictions are moving away from and that every major New Zealand supermarket and even McDonald's have rejected.[1185]

1178 National Animal Welfare Advisory Committee, above n 1106, at 7
1179 Duffield, above n 273, at 237
1180 National Animal Welfare Advisory Committee, above n 1106, at 7
1181 At 7
1182 "Upgrading Hen Housing: Latest Developments in Europe" (23 October 2009) The Poultry Site <www.thepoultrysite.com>
1183 Bessei, above n 1163, at 217
1184 "Breaking: Michigan Bans Cruel Battery Cages and more" (21 November 2019); "Victory: Oregon goes cage- free" (12 August 2019); "Breaking: Washington governor approves ban on battery cages" (8 May 2019) Compassion in World Farming <www.ciwf.com>
1185 "Free Range Eggs" (2020) McDonalds <mcdonalds.co.nz>

In addition, the use of such cages is not permitted in the Code of Welfare (Meat Chickens) 2018 and there does not appear to be any clear justification from a welfare perspective as to why layer hens and meat chickens should be so differentiated.

7.4.4 THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE'S CONSIDERATION OF PUBLIC OPINION ON COLONY CAGES

It can be argued that NAWAC failed to sufficiently consider public opinion in its decision to continue to allow colony cages, with many of the submissions to the code seeking a total ban of all cages.[1186] NAWAC is required to have regard to public submissions (as provided by s 73(2)(a) of the Act) and "societal ethical concerns" are a stated consideration of the NAWAC guidelines.[1187] Taking public opinion into account would also have been logical, with Duffield commenting that "there is little point in investing millions in new infrastructure that before long will have to be phased out in order to meet consumer expectations."[1188]

This change in public opinion is also reflected in consumer expectations: by 2018, every major New Zealand supermarket had committed to phasing out caged eggs in response to consumer feedback.[1189] Countdown, Fresh Choice and Super Value will be rejecting these eggs from 2024 – 2025, as will New World, PAK 'n SAVE, Fresh Collective and Four Square from 2027.[1190] Similarly, numerous restaurants, cafes and takeaways are also already free-range, including chains such as Pita Pit,[1191] Wendy's,[1192] Burger King,[1193] McDonald's,[1194] Hell Pizza,[1195] Burger Fuel[1196] and Cobb & Co,[1197] to name just a few examples.

As Weary *et al*. recognised, although the modified cage takes into account research on social group size, feather pecking and cannibalism, as well as the benefits of perches, dust bathing and a secluded nest site, it does not ultimately address the fundamental reasons why such cages are opposed. Rather:[1198]

> …it leaves us with a solution that appeals to a more narrow conception of welfare held by the scientists, but fails to resonate with the concerns of others who from the outset wanted cage-free systems and are thus generally less willing to support a production system based on cages, even if these are labelled 'enriched', 'modified', etc. This type of mismatch may be better avoided if efforts to describe and understand social concerns (e.g. Krystallis et al., 2009; Boogaard et al., 2011) are used to inform the direction of scientific work. In the current example, we suggest that if a sustained research effort to understand societal values around cage and non-cage rearing for laying hens had pre-dated or at least accompanied the scientific work, research would have instead focused on the development of high-welfare non-caged systems that are more likely to see widespread adoption in practice.

1186 For example, in 745 Green Party cards, 110 SPCA standard letters, 144 submissions from the Kapiti Animal Welfare Society, 66 SAFE standard letters, 10,911 SAFE e-cards, 22,681 SAFE postcards and 1276 Change.org petition submissions.
1187 National Animal Welfare Advisory Committee, above n 941, at 1
1188 Duffield, above n 273, at 237
1189 "All major NZ supermarkets to drop cage eggs", above n 315
1190 Hutching, above n 1103 and Foodstuffs "Foodstuffs announces move to cage free eggs by the end of 2027" (press release, 21 September 2017).
1191 Pitapit "Nutrition Calculator" (2020) <www.pitapit.co.nz>
1192 Wendys "Free range" (2020) <www.wendys.co.nz>
1193 Burger King "Free Range Eggs at Burger King" (press release, 2 May 2016)
1194 McDonalds, above n 1186
1195 Hell "Hell Works With The Best Free-Range Supplies" (16 April 2019) <https://hellpizza.com/wickedpedia/2019/04/16/hell-free-range>.
1196 Burger Fuel "We've Gone Free Range" (3 March 2014)<www.burgerfuel.com>.
1197 Cobb and Co "All Restaurants only use free range whole eggs" (2015)<www.cobb.co.nz>
1198 Weary, Ventura and von Keyserlingk, above n 278, at 309

The supermarkets' decision has upset industry organisations. Michael Brooks of EPF stated:[1199]

> …this was pretty distressing for a lot of the farmers when most of them spent a minimum of 1 million dollars [each] getting out of the old style cages into colonies…but that was a commercial decision made by the supermarkets, it wasn't based on science.

However, as outlined above, the science clearly shows that there are negative welfare consequences associated with the use of colony cages. In addition, much of the increase in costs to producers may be passed on to consumers – as NAWAC recognised in its report to the code.[1200]

7.5 STOCKING DENSITIES

Stocking density is another major issue in relation to both caged and barn hens. As Duffield has stated:[1201]

> …overcrowding remains a problem with these cages. For instance, after viewing footage taken of New Zealand's largest colony cage farm, prominent animal behaviourist Mark Vette commented that the hens were essentially "massed on top of one another" (Campbell Live "Video Reveals Replacement for Battery Hen Cages in New Zealand" (19 March 2012)). Vette's conclusion after viewing this footage was that hens could not be said to be able to express their natural behaviour in such systems as required by the Act.

NAWAC recognised the significance of stocking density in its report to the code. It stated:[1202]

> Stocking density can have a significant effect on the welfare of hens in laying systems. The size of the enclosure in which the hens are housed and the density of hens within the enclosure will both have effects on the distance that hens travel per day (and therefore the amount of exercise that they perform to strengthen their bones) and the distance that they remain from conspecifics (Leone and Estevez, 2008). Higher stocking densities have been associated with higher levels of injurious pecking (Nicol et al., 1999).

Similarly, in its report NAWAC linked large flock sizes to a range of health issues:[1203]

> Due to the large flock sizes in non-cages systems, birds are also prone to exhibiting greater levels of injurious pecking and cannibalism, are at a higher risk of disease and parasites and have a higher rate of mortality. Smothering can occur in non-[battery] cage systems due to the number of birds that are able to pile on each other and one smothering event can result in the death of a large number of hens (Richards et al., 2012). As a result of the substrate on the floor, the enclosed area and the number of birds contained within the area, barn systems are also prone to high levels of ammonia and dust which can have deleterious effects on the health of birds (Tauson, 2005).

In light of these considerations, NAWAC established a stocking density of seven hens per m^2 for barns with no outdoor access and nine hens per m^2 for barns with outdoor access.[1204] However, the stocking

1199 Interview with Michael Brooks, above n 19

1200 National Animal Welfare Advisory Committee, above n 1106, at 13 - "Eggs are an important source of protein with few ideal substitutes and they constitute a small proportion of the overall food budget for most consumers. Their demand in New Zealand is therefore likely to be relatively inelastic… The estimate annual increase in costs, in the long term, would be between 10-14%. This increase is likely to be reflected in a corresponding increase in the cost of eggs to consumers."

1201 Duffield, above n 273, at 236

1202 National Animal Welfare Advisory Committee, above n 1106, at 20

1203 National Animal Welfare Advisory Committee, above n 1106, at 17

1204 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 6 (Stocking Densities)

density for colony cages is much higher at 13 hens per m^2.[1205] No scientific literature was referenced in the NAWAC report to explain how NAWAC reached its findings regarding stocking densities for non-cage systems. NAWAC simply noted that these stocking densities were consistent with those applicable to non-cage systems in the EU (i.e. nine hens per m^2).[1206]

In fact, Nichol *et al*. found that egg production and plumage condition was best at a stocking density of six hens per m^2 (compared to 14, 22 or 30 hens per m^2), with mild to severe feather pecking increasing along with increases in stocking density.[1207] Albentosa *et al*. found that reducing the number of hens in a furnished cage such that each hen had 3048 cm^2 rather than 762 cm^2 led to an increase in comfort behaviours such as wing/leg stretches and tail wags.[1208] Campbell *et al*. found that stocking density impacts on the use of the outdoor range, with hens from the lowest stocking density (2000 hens/ha) accessing the range for longer each day than hens from the highest stocking density (20,000 hens/ha).[1209]

Additionally, while the code provides that stocking of the outdoor ranging area must not exceed 2,500 hens per hectare in relation to barn systems,[1210] NAWAC has subsequently stated in a meeting minute in 2016 that the range should be managed "to ensure grass cover for disease/parasite reasons and enrichment… [meaning] that effectively birds are running at stocking densities more like 4,000 birds per hectare."[1211] None of this is outlined in the code of welfare or regulations. In this same meeting minute NAWAC noted EU guidelines, which state that stocking density should not be greater than 2,000 birds per hectare or 1 hen per m^2.[1212] It is concerning that NAWAC has justified adopting standards that appear inadequate based on the science when the EU has also adopted lower standards, and yet is rejecting EU standards when they are higher.

In 2017 MPI advised that stocking densities for layer hens and meat chickens would be reviewed as part of its establishing new animal welfare regulations.[1213] However, no such regulations have been promulgated yet.

1205 Minimum Standard No. 6 (Stocking Densities)
1206 National Animal Welfare Advisory Committee, above n 1106, at 20
1207 C.J Nicol and others "Differential effects of increased stocking density, mediated by increased flock size, on feather pecking and aggression in laying hens" (1999) 65 Appl. Anim. Behav. Sci. 137 at 137
1208 M J Albentosa and J Cooper "Effects of cage height and stocking density on the frequency of comfort behaviours performed by laying hens housed in furnished cages" (2004) 13 Animal Welfare, 419 at 419.
1209 D. L. M. Campbell, G N. Hinch, T. R. Dyall, L. Warin, B. A. Little and C. Lee "Outdoor stocking density in free-range laying hens: radio-frequency identification of impacts on range use" (2017) 11 Animal 121.
1210 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 6 (Stocking Densities)
1211 National Animal Welfare Advisory Committee Minute "General Meeting" (18 May 2016) at [C 5]
1212 At [C 5]
1213 Regulatory Impact Statement: Animal Welfare Regulations 2017 (18 April 2018) Ministry for Primary Industries <www.mpi.govt.nz> at 16 and 36.

FREE-RANGE FARMS

No stocking densities are explicitly provided for in relation to free-range farms. NAWAC has recently considered whether there should be regulations in relation to this.[1214] However, these have not yet been progressed with the committee expressing concern that farmers "are sometimes still learning how to use the range, they are still working on providing cover, and they still need to work on getting the birds outside more consistently."[1215] Additionally, it noted that the question of stocking density has "become a sticking point with industry who believe the space allowance in the code of welfare is too large."[1216] Given this, the committee considered that:[1217]

> …regulating space allowance alone may affect birds (as fewer farmers may wish to move to free range); NAWAC may be better to review free range standards in general, including provision of cover or enrichment in the range, and enable or encourage the industry to innovate.

NAWAC has thus recognised the necessity for separate consideration of free-range and barn systems, but this has never taken place. A review has never been conducted on this issue and the code of welfare and regulations have not been amended to address the issue of free-range standards.

1214 National Animal Welfare Advisory Committee, above n 533, at [C 9]
1215 At [C 9]
1216 At [C 9]
1217 At [C 9]

7.6 BEHAVIOURAL NEEDS

The code provides for minimum standards regarding the behaviours that layer hens should be able to express. Minimum standard 12(a) (Behaviour) states:[1218]

> Hens must have the opportunity to express a range of normal behaviours. These include, but are not limited to nesting, perching, scratching, ground pecking, and dust bathing.

In this way the code recognises a range of behaviours that layer hens feel a "strong need"[1219] to perform. However the minimum standard does not provide for the full range of behaviours, which layer hens need to express. These are outlined by NAWAC in its report to the code:[1220]

> Behaviours considered important for laying hens are feeding, drinking, perching, sleeping, preening, dust bathing, ground pecking, wing flapping, scratching, nesting, head shaking, tail wagging, feather ruffling, beak wiping [and] unilateral wing-leg stretching…

Despite NAWAC recognising their importance, the code and regulations fails to recognise and protect a number of these behaviours, including preening, wing flapping, head shaking, tail wagging, feather ruffling, beak wiping and unilateral wing-leg stretching. Further, the code does not recognise a number of behaviours that *are* provided in the Code of Welfare (Meat Chickens) 2018, including preening, walking, leg stretching and vocalising.[1221] It is not clear why these behaviours are mandatory for chickens when they are farmed for their meat and *not* when they are farmed for the purposes of laying eggs.

Additionally, while it is a recommended best practice that all "hens should be provided with several resources to promote foraging behaviour"[1222] and in barns all hens are required to have access to good quality friable litter to allow them to scratch and forage,[1223] this is not a mandatory requirement for birds housed in cages. This is problematic as foraging "is a behavioural need, with peat, sand and wood shavings preferred substrates in choice experiments."[1224] NAWAC recognised in the code that foraging is a behaviour layer hens have "retained a strong need to perform"[1225] and that injurious pecking "is often associated with poor foraging opportunities…"[1226] Despite this, layer hens are not guaranteed access to this behavioural need.

1218 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 12(a) (Behaviour)
1219 At 19
1220 National Animal Welfare Advisory Committee, above n 1106, at 10
1221 Code of Welfare (Meat Chickens) 2018, Minimum Standard No. 11 (Providing for Behavioural Needs)
1222 Minimum Standard No. 12 (Behaviour), Recommended Best Practice (e)
1223 Minimum Standard No. 4 (Housing and Equipment Design, Construction and Maintenance)
1224 CA Weeks and C J Nicol "Behavioral needs, priorities and preferences of laying hens" (2006) 62 World Poultry Sci J 296
1225 Code of Welfare (Layer Hens) 2018 at 19
1226 At 20

7.6.1 ACCESS TO ENVIRONMENTAL ENRICHMENT

There is also no requirement in the code that hens have access to a range of environmental enrichments, which would facilitate the performance of the behaviours that *are* included in the code – being nesting, perching, scratching, ground pecking and dust bathing.

Campbell *et al*. found that "enriching the environment with physical, sensory and stimulatory additions can optimise the birds' [physiological and behavioural] development."[1227] Such enrichments could include the provision of perches or elevated tiers; visual stimulation; playback of mother hen sounds; the inclusion of novel objects; enrichments that cater to the birds behavioural needs of dust bathing, perching and foraging; and provision of pecking enrichments in addition to litter. The authors also noted that such enrichment items need to be sturdy to avoid getting destroyed and so that they can support bird weight (with birds being motivated to perch wherever possible) and need to be available in large quantities, given that chicken rearing sheds can hold thousands of birds.[1228] A number of these enrichments are included as recommended best practice provisions in the code of welfare, for example it is recommended that pullets reared for barn systems be reared with access to litter and perches from 6 – 18 weeks of age;[1229] that layer hens should be provided with litter for dust bathing;[1230] and that hens should be provided with several resources to promote foraging behaviour.[1231] However, these enrichments are not included as minimum standards and are therefore not mandatory. Additionally, although the recommended best practice provides that "resources should be located in a way that minimises competition between birds and encourages them to perform a range of normal behaviours,"[1232] the recommendation does not extend to providing that the enrichment devices be sufficient to cater to *all* the birds in that system.

7.6.2 ACCESS TO THE OUTDOORS

Similar to meat chickens, there is no requirement that layer hens have access to the outdoors. Such access would facilitate the expression of their normal behaviours.

Chielo *et al*. found that birds provided with an outdoor range walked and foraged more, and "showed signs of better welfare".[1233] Knierim found that a rich outdoor environment can stimulate exploratory and foraging behaviour, for example a diversity of plant species and access to small animals such as insects, worms or mice may stimulate pecking, scratching, tearing, biting, harvesting, hunting and digging behaviours.[1234] The authors noted previous studies stating that an outdoor environment also allows for increased sunbathing, locomotion, running and flying,[1235] and that access to an outdoor run has the potential to decrease the risk of feather pecking.[1236]

1227 D Campbell, E de Haas and C Lee, "A review of environmental enrichment for laying hens during rearing in relation to their behavioral and physiological development" (2019) 98 Poultry Science 9 at 9
1228 At 22
1229 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 12 (Behaviour), Recommended Best Practice (a)
1230 Minimum Standard No. 12 (Behaviour), Recommended Best Practice (c)
1231 Minimum Standard No. 12 (Behaviour), Recommended Best Practice (e)
1232 Minimum Standard No. 12 (Behaviour), Recommended Best Practice (d)
1233 LK Chielo, T Pike and J Cooper "Ranging Behaviour of Commercial Free-Range Laying Hens" (2016) 6 Animals 1 at 1
1234 U Knierim "Animal welfare aspects of outdoors runs for laying hens: a review" (2006) 54 NJAS 133,
1235 At 135
1236 At 135

7.6.3 "ESSENTIAL" AND "NON-ESSENTIAL" BEHAVIOURS

In its report on the code, NAWAC found that certain natural behaviours would be restricted in the code of welfare:[1237]

> There are many behaviours which the majority of domestic hens cannot express while being housed in any commercial egg producing system, be that cage, barn or barn with outdoor access.

It justified this by contending that the opportunity for hens to display all their normal patterns of behaviour is not essential, with some patterns of behaviour being essential to a hen's welfare and others not. NAWAC stated:[1238]

> …[some] behaviours, including extensive locomotion and exploration, sexual behaviour and brooding (when it occurs), are considered non-essential for a bird's welfare and the birds will not experience reduced welfare if prevented from performing these behaviours as a result of the housing system in which they exist (Duncan, 1998).

NAWAC cited only one study in support of this conclusion being Duncan.[1239] However, while Duncan found that locomotion and exploration are not 'essential' in that the lack of these behaviours is not indicative of suffering per se, he also considered that these behaviours could be "indicative of contentment or happiness"[1240] and that this may be a valid welfare indicator. In other words, such behaviours could indicate positive welfare, which is an approach to animal welfare that NAWAC has identified as increasingly important in establishing standards under codes of welfare and regulations.[1241]

A number of commentators have disputed NAWAC's decision to differentiate between 'essential' and 'non-essential' behaviours. As Duffield stated:[1242]

> This distinction is a precarious one: the statutory requirement in s 4 is that hens be able to express "normal patterns of behaviour", not that they must only be able to "express patterns of behaviour that are essential to their welfare." Indeed, rather than qualifying this provision with a high- threshold requirement of "essentialness", the stipulation in ss 9 and 10 that these natural patterns of behaviour be met in accordance with "good practice" would imply that the Act anticipates high standards of welfare. For instance, whilst "good practice" is not defined in the Act, NAWAC's own definition of this stipulates that it is a standard of care that "promotes the interests of the animals to which it is applied" (NAWAC "Guidelines for Writing Codes of Welfare" (June 2009) at 14). Furthermore, even if this were a sound distinction, NAWAC's contention that [extensive] locomotion and associated activities are not essential to a hen's welfare remains…questionable.

1237 National Animal Welfare Advisory Committee, above n 1106, at 10

1238 At 10

1239 I Duncan, "Behavior and behavioral needs" (1998) 77 Poultry Science, 1766

1240 At 1767

1241 For example, the current Chair of NAWAC has recognised that "[future] code reviews will need to consider the implications of affective state and positive emotions" (National Animal Welfare Advisory Committee, above n 197). Kate Littin of MPI wrote in 2019 that "[it] is a stated intention of the National Animal Welfare Advisory Committee that positive welfare will be addressed in minimum standards as codes of welfare are reviewed (currently only a few codes have standards around positive welfare)" (Ministry for Primary Industries Welfare Pulse (Issue 28, July 2019) https://www.mpi.govt.nz/dmsdocument/35475-welfare-pulse-issue-28-june-2019 at 1). And in a submission to the Primary Production Committee in 2018 NAWAC stated: "Legislative recognition of sentience in the 2015 amendment to the Animal Welfare Act has promoted the need to consider the emotional state of the animals in welfare assessments, and to move towards developing animal management systems that promote positive emotions" (National Animal Welfare Advisory Committee, above n 199, at 3 and 6).

1242 Duffield, above n 273, at 236

NAWAC's approach was also challenged by SAFE which, in 2015, lodged a complaint with the RRC that the Code of Welfare (Layer Hens) 2012 still permitted the use of colony cages and that their use is not justified under the Act.[1243] SAFE objected to the Code on three grounds under Standing Order 319:

- The code is not in accordance with the general objects and intentions of the enactment under which it is made (SO 319(2)(a)).
- The code appears to make some unusual or unexpected use of the powers conferred by the enactment under which it is made (SO 319(2)(c)).
- The code was not made in compliance with particular notice and consultation procedures prescribed by applicable enactments (SO 319(2)(h)).

The RRC is not allowed to consider the underlying policy of the code, however it does have the power to scrutinise the code on technical grounds.[1244] It found that the only part of the complaint that fell within its jurisdiction was the second of these grounds, relating to NAWAC's application of s 4 of the Act (which defines 'physical, health and behavioural needs')[1245] and whether it resulted in the code making an unusual or unexpected use of the powers conferred under the Act.

SAFE stated that the Act requires animals be given the opportunity to display normal patterns of behaviour and that the Act does not provide for the distinction made by NAWAC between normal patterns of behaviour that are considered "essential to welfare" and those that are not. SAFE argued that this approach to the interpretation of "physical, health, and behavioural needs" is inconsistent with the overall policy of the Act and appears to be used by NAWAC to "justify trade-offs between welfare matters and matters of convenience for egg producers."[1246] In response, MPI argued that s 4:[1247]

> …must be interpreted to allow distinctions to be made between animals depending on their environment and the circumstances that they are kept in…[and] highlighted that wild hens would have different behavioural needs to layer hens, which have been bred for the purpose of laying eggs on a production-type scale.

The RRC found that the grounds of the complaint were not made out, as it could not say that the code represented an unusual or unexpected use of powers under the Act. It considered that the Act does allow for some limitations on displaying normal patterns of behaviour; that "not all normal patterns of behaviour are required to be displayed in all systems";[1248] and that "animals must be able to display a reasonable range of behaviours that are beneficial to the animal."[1249] However, it did consider the matter to be "finely balanced"[1250] and was critical of NAWAC's approach.

The RRC considered that the way in which NAWAC had drafted its report did not "readily [evidence] the application of the Act to NAWAC's findings."[1251] For example, NAWAC had focussed on a scientific analysis

1243 SAFE "Submission to the Regulations Review Committee on the Code of Welfare (Layer Hens) 2012"
1244 As outlined in Standing Orders of the House of Representatives 2017, SO 319(2)(a) – (i)
1245 Being proper and sufficient food; proper and sufficient water; adequate shelter ;opportunity to display normal patterns of behaviour; physical handling in a manner which minimises the likelihood of unreasonable or unnecessary pain or distress; protection from, and rapid diagnosis of, any significant injury or disease… being a need which, in each case, is appropriate to the species, environment, and circumstances of the animal.
1246 *Complaint about Animal Welfare (Layer Hens) Code of Welfare: Report of the Regulations Review Committee* (New Zealand Parliament, 14 October 2016) at 5.
1247 At 5
1248 At 6
1249 At 6
1250 At 5
1251 At 5 and 7

rather than the Act itself, an approach that could readily lead to confusion as well as assumptions that the report's recommendations were an unusual or unexpected use of the powers conferred on NAWAC statutory powers by the Act. This was evident in NAWAC's reference to 'essential' and 'non-essential' behaviours, being a distinction not found in the Act itself. The RRC recommended that NAWAC avoid such deficiencies in the future and "ensure that future reports articulate much more clearly how a particular decision meets the requirements of the Act."[1252] It also recommended that the Government improve the clarity of the Act when it is next reviewed.

7.7 SHADE AND SHELTER

In the introduction to minimum standard 3 (Shelter and Shade) the code recognises that:[1253]

> …shade and shelter outdoors, such as trees, shrubs or artificial structures, are important in encouraging hens to fully utilise the outside area and spacing of shelter less than 10 m apart will also encourage use of the outside area.

This reflects the tendency of chickens to avoid outdoor areas without appropriate cover, due to their natural fear of predators. Minimum standard 11 (Range Management) also provides for range management where hens are provided with an outdoor area. The introduction to this standard recognises that:

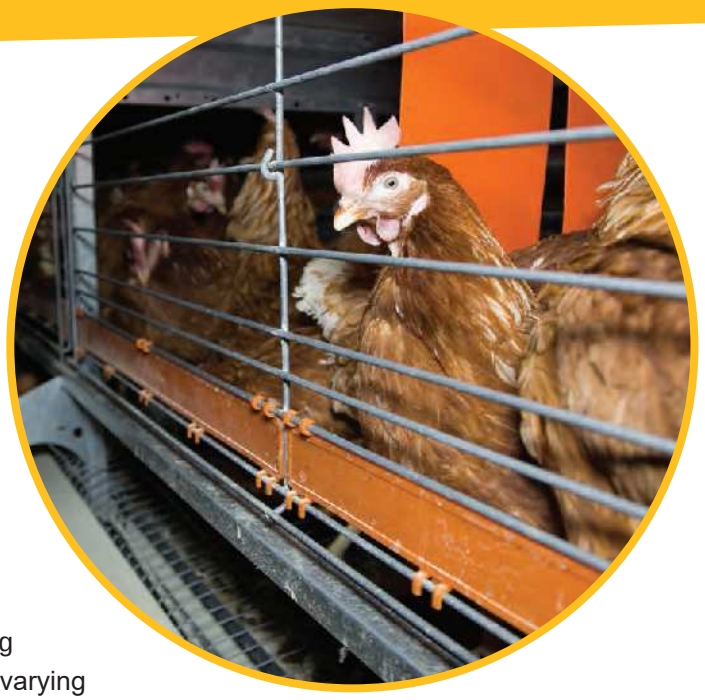
> …[hens] are fearful of wide open spaces and so providing and managing overhead shade and shelter on the range encourages its use and allows the hens to display a wider range of natural behaviours.

This tendency was discussed in the NAWAC report to the code of welfare, with reference to the current scientific literature on the subject.[1254] However although the code provides all hens must have access to shelter from adverse weather and to minimise the risk of predation,[1255] there are no mandatory minimum standards or regulations requiring shelter in outdoor areas such that hens will actually use the outdoor area.

The omission is significant as even if chickens are provided with an outdoor area and some shelter, they will be unlikely to use it if the coverage is inadequate. It is also contrary to s 4(b) of the Act, which includes adequate shelter in the definition of 'physical, health and behavioural needs' in relation to an animal.[1256]

1252 At 6 - 7
1253 Code of Welfare (Layer Hens) 2018 at 9
1254 National Animal Welfare Advisory Committee, above n 1106, at 5
1255 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 3(a) (Shelter and Shade)
1256 Animal Welfare Act 1999, s 4(b)

7.8 VENTILATION



NAWAC has approached the issue of ventilation for layer hens in a manner that is almost identical to their treatment of this issue in regards to meat chickens.

Minimum standard 8 (Air Quality and Ventilation) of the layer hen code of welfare provides for ammonia levels to reach as high as 20 ppm, with recommended best practice set at 10 ppm. NAWAC reduced the current levels to 20ppm in light of research investigating "avoidance behaviour of poultry in response to varying concentrations of ammonia [which] suggested that birds find environments with levels above 10ppm aversive (Jones et al., 2005)."[1257] Given that finding, apparently endorsed by NAWAC in both the layer hen code of welfare and the meat chicken code of welfare, it is surprising that both codes allow for an ammonia level twice as high as this.

As stated at section 6.6.2, it has been found that "prolonged exposure to concentrations as low as 20 ppm can be detrimental to bird health and performance, when poultry remain in such an environment throughout the production period"[1258] – particularly in their susceptibility to Newcastle's disease and to respiratory tract damage.[1259] When given the choice layer hens prefer a fresh air environment to an ammoniated environment.[1260]

Similarly to the Code of Welfare (Meat Chickens) 2018, NAWAC based its decision to permit ammonia levels to 20ppm in the Code of Welfare (Layer Hens) 2018 on international guidelines for poultry in the European Union and the United Kingdom,[1261] despite the scientific literature indicating that such high levels of ammonia fail to meet the welfare needs of layer hens. NAWAC has acknowledged that ammonia levels "were set for good historical reasons but [are] not based strongly on science."[1262]

It is also not a requirement of the code or regulations that these levels be measured and monitored by farmers.[1263] This is problematic as where farmers do not measure and monitor ammonia levels, they cannot be sure that these levels are within the permitted parameters.

1257 National Animal Welfare Advisory Committee, above n 1106, at 9
1258 Ritz et al, above n 1028, at 686
1259 Anderson et al, above n 1029
1260 Wathes et al, above n 850, at 1605
1261 National Animal Welfare Advisory Committee, above n 1106, at 9
1262 National Animal Welfare Advisory Committee, above n 523, at 14
1263 This is only a recommended best practice. Code of Welfare (Layer Hens) 2018, Minimum Standard No. 8 (Ventilation), Recommended Best Practice (a) states: "Air quality parameters, such as ammonia levels, should be monitored and recorded on a weekly basis."

7.9 LIGHTING

Minimum standard 7(d) (Lighting) provides that lighting levels during the light phase should be no lower than 20 lux at hen level, so that hens can see each other and their surroundings. The recommended best practice section provides that light intensity should be at least 50 lux.[1264] These standards are identical to those contained in the Code of Welfare (Meat Chickens) 2018, bar the requirement for 20 lux at hen level being a mandatory requirement under the Code of Welfare (Layer Hens) 2018.[1265]

As with meat chickens, NAWAC identified a "lack of scientific information in this area"[1266] in its report to the Code of Welfare (Layer Hens) 2018 and therefore set the parameters at 20 – 50 lux in order to "safeguard the welfare of housed poultry."[1267] And as with meat chickens, there were a number of studies conducted prior to 2012 that NAWAC did not consider. For instance, Davies *et al*. found that when resting and perching layer hens prefer to occupy light environments of 200 lux rather than 6, 20 or 60 lux at 2 weeks of age, and to occupy an environment of 6 lux at 6 weeks of age.[1268] Prescott and Wathes found that hens showed a strong and active preference for feeding under bright light (200 lux) rather than very dim light (<1 lux) and that hens were prepared to work 2.3 times harder to gain access to feed in 200 rather than <1 lux.[1269] A number of studies have observed that hens aggregate in bright patches of a poultry house and in a partly covered yard, a behaviour that's believed to be related to sunbathing.[1270] Hughes and Black found higher levels of activity (standing and pacing) in layer hens housed at 55-80 lux than 17 – 22 lux[1271] and Martin found that laying hens were more active in 500 lux than 50 lux.[1272] None of these findings were recognised by NAWAC in its report.

Subsequently to NAWAC's report, Ma *et al*. (2015) found that layer hens preferred to spend the bulk of their waking time in a low light intensity of 5 lux (6.4 hours or 45.4%), with approximately the same amount of time spent in light intensities of 15 lux (3 hours or 22.1%) and 30 lux (3.1 hours or 22.2%) and the least amount of time spent at 100 lux (1.5 hours or 10.3%).[1273] This contrasts with what is provided for in commercial egg production facilities i.e. 20 – 30 lux during the entirety of the waking period. Getting this right is important because, as Ma *et al*. recognised:[1274]

> …some studies have reported that lower light intensity could reduce the incidence of cannibalism and feather pecking for layers…However, improper low light intensity (e.g. 1.1 lux) could cause issues for broilers such as adrenal overweight (Siopes et al., 1984), body underweight (Hester et al., 1987), leg problems (Hester et al., 1985; Deep et al., 2010) and partial or complete blindness due to eye morphology change (Blatchford et al., 2009; Deep et al., 2010).

1264 Minimum Standard No. 8, Recommended Best Practice (b)
1265 Code of Welfare (Meat Chickens) 2018, Minimum Standard No 6 (Lighting) Example Indicator; Code of Welfare (Meat Chickens) 2018, Minimum Standard No 6 (Lighting), Recommended Best Practice (c)
1266 National Animal Welfare Advisory Committee, above n 1106, at 9
1267 At 9
1268 N Davis and others "Preferences of growing fowls for different light intensities in relation to age strain and behaviour" 8 (1999) Animal Welfare 193 at 193
1269 N Prescott and C Wathes "Preferences and motivation of laying hens to eat under different illuminances and the effect of illuminance on eating behaviour" (2002) 43 British Poultry Science 190 at 194
1270 A number of these are cited in Kristensen, above n 1041, at 18
1271 Hughes and Black, above n 1063
1272 G Martin "Influence of light intensity on feather pecking of hens on deep litter or wire floor" (1989) 342 KTBL Schrift 108.
1273 H. Ma, H. Xin, Y. Zhao, B. Li, T.A. Shepherd and I. Alvarez "Assessment of lighting needs by W-36 laying hens via preference test" (2016) 10 Animal 671 at 671.
1274 At 671

The above study suggests that there could be a more nuanced approach to lighting for layer hens, with greater variation in lux during waking hours. At the very least, NAWAC should review the latest scientific information that has become available since 2012, given that it's now been nine years since it wrote its report citing a lack of scientific information in this area.

Finally, minimum standard 7 provides for a training period wherein chicks "must be provided with light of at least 50 lux at chick level for at least the first seven days so they can easily locate food and water."[1275] There is a lack of clarity regarding this minimum standard as it is unclear whether 50 lux should be provided for 24 hours a day for the first seven days, or whether 50 lux is to be provided only during the light period. Further, while it is common internationally for farmers to provide 24 hour lighting in the first seven days of life to enable chicks to find food and water, such conditions tend to result in smaller birds; an increased incidence of feather pecking; and more birds missing feathers, as compared to birds raised in an environment where the heating element is placed in a darkened area that allows the chicks to rest simultaneously and reduces disturbance.[1276] As such, it may be better from a welfare perspective to eliminate this minimum standard.

1275 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 7(a) (Lighting)

1276 Welfare Pulse, above n 1150, at 13 citing Anne-Marie Gilani, Toby G. Knowles, Christine J. Nicol "The effect of dark brooders on feather pecking in commercial farms" (2012) 142 Appl. Anim. Behav. Sci. 42.

7.10 CATCHING

The issues associated with catching layer hens are similar to the issues we have identified in relation to meat chickens at section 6.7.

Minimum standard 13(e) (Handling and Catching) of the Code of Welfare (Layer Hens) 2018 allows handlers to carry four hens in each hand at any one time. However, Weeks notes studies from as early as 1993 finding that layer hens are significantly more stressed:[1277]

> …when removed from their cages three at a time and carried in an inverted position from the house, than when they were removed singly and crated before removal from the house.

Similarly, Weeks stated:[1278]

> …all hens in experimental handling treatments had high concentrations of corticosterone [a stress hormone] in comparison with the control birds, which were removed individually and gently from their cages in an upright position.

Kittelsen *et al*. found that carrying birds under the abdomen so that they are in an upright position results in fewer wing fractures.[1279] Realistically one must also question the ability of handlers to avoid bone breakages when carrying as many as eight chickens at a time. For instance, Gregory and Wilkins found that where three battery hens were held in one hand and four in the other and carried to the transport vehicle, this resulted in an average of 24% of birds with broken bones.[1280]

There is also evidence that layer hens experience less stress when transported from cages to road transport on a conveyor belt system. Weeks stated, "well-designed automated handling devices would seem to have the potential to reduce trauma and fear."[1281] However, there are no recommended best practice or minimum standards relating to the use of automated handling devices.

A review of the latest scientific literature on this issue is required.

1277 Weeks, above n 1038

1278 Weeks, above n 1038

1279 Kittelsen et al, above n 1037, at 141

1280 N Gregory and L Wilkins "Broken bones in domestic fowl: handling and processing damage in end-of-lay battery hens" (1989) 31 Br. Poult. Sci. 555.

1281 Weeks, above n 1038. See also G.B. Scott and P. Moran "Fear levels in laying hens carried by hand and by mechanical conveyors" (1993) 36 Appl. Anim. Behav. Sci. 337

7.11 BEAK TRIMMING

Minimum standard 16 provides for beak trimming (also known as 'beak tipping'), entailing up to a quarter of a chick's beak being removed with an infrared beam to prevent future injurious pecking to the chick's companions.[1282] Regulations coming into effect from 9 May 2021 will provide that beak trimming is only allowed on layer hens that are 3 days of age or under; no more than 25% of the beak may be trimmed; the upper and lower beak must be trimmed to the same length; an infrared bream must be used for the procedure; the person who trims the beak must be experienced and able to recognise early signs of significant distress, injury or ill-health; and the owner of and every person in charge of a layer hen having its beak trimmed must ensure the welfare needs of the animal are met during the procedure and recovery by ensuring that at all times a person is available who has suitable equipment and has the relevant knowledge, received relevant training or is under appropriate supervision.[1283]

While these new requirements are an improvement, beak trimming remains problematic. The NAWAC report to the code of welfare recognised that the "performance of this procedure has the potential to cause acute and chronic pain to the hens."[1284] Even a newer technique called 'InfraRed beam Beak Treatment' "is still likely to cause some acute pain…"[1285]

Additionally, there are other means through which injurious pecking can be reduced or eliminated. For instance, low stocking densities enable easier identification of animals exhibiting injurious pecking, which can then be removed. Campbell *et al*. found that the provision "of pecking stimulation will reduce the development of gentle and severe feather pecking behaviour."[1286] And NAWAC recognised in its report that instances of injurious pecking can be mitigated through identifying and removing the birds exhibiting this behaviour; through facilitating opportunities to forage in litter; and through providing for lower stocking densities.[1287]

In Switzerland, Sweden, Norway and Finland beak trimming is banned and since 2017 Germany has encouraged its egg producers to abandon beak trimming voluntarily.[1288] New Zealand should similarly ban this practice.

1282 Code of Welfare (Layer Hens) 2018, Minimum Standard No 16

1283 Animal Welfare (Care and Procedures) Amendment Regulations 2020, regulation 56B. This regulation will also be reflected in amendments to the Code of Welfare (Layer Hens) 2018 at Minimum Standards No. 16(b) ("Beak tipping, when undertaken, must be done using an infrared beam on a layer hen that is 3 days of age or under") and No. 16(d) ("A person who tips the beak of a layer hen must remove no more than 25% of the beak of the layer hen and must trim the upper and lower beak to the same length. This means for chicks that are 3 days of age or under, no more than 2 mm of the beak.")

1284 National Animal Welfare Advisory Committee, above n 1106, at 21

1285 At 22

1286 Campbell et al, above n 1228, at 22

1287 National Animal Welfare Advisory Committee, above n 1106, at 20. NAWAC recognised that "[higher] stocking densities have been associated with higher levels of injurious pecking (Nicol et al., 1999)."

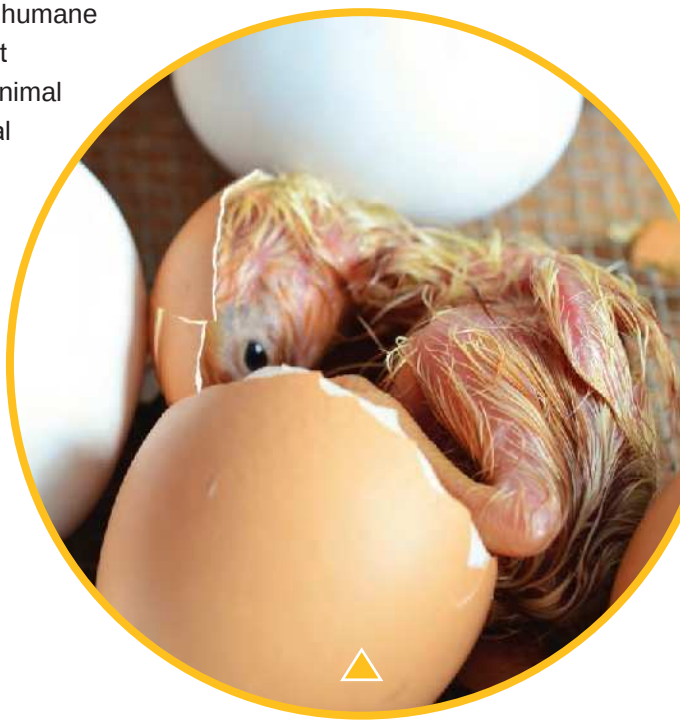
1288 Bessei, above n 1163, at 218

7.12 LIVE GASSING AND MACERATION OF MALE CHICKS

The destruction of male chicks through live maceration or gassing is a common practice in the layer hen industry. Live maceration or gassing accounts for about three million male chicks destroyed every year.[1289] These chicks are destroyed because they are not able to produce eggs and are therefore considered a waste by-product of the industry. This practice has shocked not only the public, but also staff who have previously been unprepared for having to carry out the practice.[1290]

Minimum standard 17 (Emergency Humane Destruction) of the Code of Welfare (Layer Hens) 2018 prescribes requirements for the 'humane destruction' of hens and chicks. The code requires that the methods used to kill these chicks "ensure rapid death, which is confirmed by inspection."[1291] However, the method of live gassing as outlined in the code may not ensure this, as it permits the use of carbon dioxide which the Farm Animal Welfare Council considered aversive as it can cause respiratory discomfort in chicks throughout the killing process (the Council recommended the use of argon as a substitute).[1292] In fact, "highly concentrated [carbon dioxide mixtures] are banned in various jurisdictions/nations, at varying high concentrations."[1293]

The code also requires any equipment used for the purpose of humane destruction to be "well maintained and not overloaded, so that it operates effectively and efficiently."[1294] Despite this, the Farm Animal Welfare Council has noted that maceration "may not be an ideal method for large numbers of chicks, especially if the rate of delivery of chicks exceeds the capacity of the machine."[1295]



In 2019 Switzerland banned chick maceration, and France and Germany have moved to ban the mass live maceration of male chicks through the development of technology that enables farmers to determine the gender of a chicken embryo in an egg prior to hatching.[1296] Industry in New Zealand has shown a willingness to use these technologies if they are "seen to work",[1297] however there are no requirements in the code of welfare or regulations regulating or promoting their use, or the development of such technologies.

1289 Catherine Harris "Poultry industry hails potential to avoid male chick cull" *Stuff* (online ed, New Zealand, 12 June 2016).
1290 Anne Beston "Chick-shredding ordeal shocks unprepared staff" *NZ Herald* (online ed, New Zealand, 7 April 2001)
1291 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 17
1292 Farm Animal Welfare Council, *Report on the Welfare of Farmed Animals At Slaughter or Killing – Part 2: White Meat Animals*, (Farm Animal Welfare Council, London, May 2009) at 256. "[The Farm Animal Welfare Council] would like to see the end of aversive gases for killing chicks. We witnessed the use of other gases, such as argon (with less than 2% residual oxygen), in commercial hatcheries. A dwell time of 3 minutes ensured that all chicks were dead and unconsciousness was reported to be reached quickly and without convulsions. Argon is inert, heavier than air and kills chicks by anoxia. It does not seem to cause the respiratory discomfort in chicks that is seen with carbon dioxide. Nitrogen has similar anoxic properties but is lighter than air and more difficult to handle. A residual oxygen concentration below 2% is essential for anoxia."
1293 Email from Professor Andrew Knight (New Zealand Veterinary Specialist, Griffith University) to the author regarding the maceration of live chicks (18 May 2020).
1294 Code of Welfare (Layer Hens) 2018, Minimum Standard No. 17(c)
1295 Farm Animal Welfare Council, above n 1293, at 257
1296 Agence France-Presse "France moves to ban mass live-shredding of male chicks" *The Guardian* (online ed, France, 29 January 2020)
1297 Harris, above n 1290 quoting Michael Brooks

7.13 SELECTIVE BREEDING

Selective breeding is not specifically addressed in the code of welfare for layer hens, however there are a number of potential issues associated with this.

For instance, O'Hara and O'Connor stated:[1298]

> The modern laying hen is the product of heavy selection pressure for productivity and productive efficiency…There is evidence that selection for high productivity in confined environments has contributed to the prevalence of feather pecking and aggressive behaviours and to the risk of bone fractures during lay and at depopulation…

Additionally, there may be some issues relating to the high production rate of laying hens and calcium deficiencies. Hans Kriek of SAFE stated:[1299]

> …these animals have been selectively bred to produce 300 eggs per year. Every time they lay an egg, it draws calcium out of the animal's body, so that's why you find osteoporosis in layer hens.

The Humane Society of the United States similarly released a report regarding the selective breeding of egg-laying hens for productivity. This report found that moving calcium from the bones to egg shells leads to increased incidences of osteoporosis, which is exacerbated by the hen's inability to exercise in a caged environment. The report also found that such high levels of productivity can lead to other health issues such as cloacal prolapse (where the end of the reproductive tract fails to retract during oviposition); salpingitis (an inflammation of the reproductive tract); and tumours in the oviduct.[1300]

Fernyhough *et al*. further confirmed that osteoporosis is an issue affecting layer hens, which is related to selective breeding. They stated:[1301]

> Bone health has long been a reported problem in commercial laying hens…Selective breeding for productivity traits means that the calcium required for egg shell production is greater than the medullary bone can supply; structural bone becomes utilised in egg shell production and subsequently bones become osteoporotic, resulting in bone fragility. Once a fracture occurs, egg production appears to fall, suggesting there is a tradeoff or re-partitioning of resources within the hen (Rufener et al. 2018). But whether KBF (keel bone fracture) occurs as a result of osteoporosis is unclear (Gebhardt-Henrich et al. 2017), with other factors including nutrition playing a role (Tarlton et al. 2013; Toscano et al. 2015).

Gebhardt-Henrich and Fröhlich linked bone fractures to egg laying rates, finding that birds who laid their eggs earlier had a higher incidence of bone keel bone fractures:[1302]

> The occurrence of new fractures was temporally linked to egg laying: more new fractures occurred during the time when laying rates were highest. Hens with fractured keel bones at depopulation had laid their first egg earlier than hens with intact keel bones.

1298 O'Hara and C. O'Connor, above n 191, at 212
1299 Interview with Hans Kriek, above n 15
1300 The Humane Society of the United States "Welfare Issues with Selective Breeding of Egg-Laying Hens for Productivity" (2007)
1301 M Fernyhough et al, above n 1174, at 22
1302 S Gebhardt-Henrich and E Fröhlich "Early Onset of Laying and Bumblefoot Favour Keel Bone Fractures" (2015) 5 Animals at 1192

The study did not find a correlation between the total number of eggs laid and keel bone fractures, or with the onset of egg laying. However, it did show that there are high incidences of keel bone fractures within layer hen populations, with about 62% of hens in this study having broken keel bones at depopulation.

The breeding for layer hens and meat chickens "is fundamentally done overseas."[1303] However, industry organisations such as PIANZ and EPF "report to [overseas breeders] all the time as to what the concerns of NAWAC [are] in terms of breeding and their advice."[1304] Michael Brooks of EPF and PIANZ also considers that over time "in a range of welfare measures, they've improved."[1305] However, none of this is addressed in the code of welfare.

The code of welfare and/or regulations may need to be amended to adequately acknowledge the significance of selective breeding; the impact this has on the welfare of layer hens; and how such welfare impacts may be ameliorated.

1303 Interview with Michael Brooks, above n 19
1304 Interview with Michael Brooks
1305 Interview with Michael Brooks

“FISH ARE JUST AS ADVANCED AS HUMANS... OR ANY OTHER ANIMAL.”

MARK PREECE - OF THE NEW ZEALAND SALMON FARMERS ASSOCIATION

CHAPTER 8 - A CODE OF WELFARE FOR FARMED FISH

8.1 OVERVIEW

The aquaculture industry in New Zealand currently consists of green-lipped mussels, Pacific oysters and King (Chinook) salmon.[1306] A number of other species have been commercially farmed, however these are at a small scale.[1307]

Fish are included in the definition of 'animal' under the Act and therefore acknowledged as sentient.[1308] Despite this, there is no code of welfare for fish.[1309] The only code of relevance to fish farming is the Code of Welfare (Commercial Slaughter) 2018, which provides a limited range of minimum standards regulating the stocking densities and slaughter of farmed fish.

The absence of a specific code of welfare for farmed fish is concerning, as it means there is limited guidance available on how fish should be farmed in order to ensure their physical, health and behavioural needs are met (as required by the Act). Such guidance is essential given the extent of New Zealand's fishing industry, with approximately 15,000 metric tonnes of Chinook salmon harvested from fish farms every year.[1310] While many other animals come within the definition of the Act and also do not have a code, we consider a code of welfare for fish particularly important given the sheer volume of fish farmed in New Zealand every year. The kind of welfare improvements that might be implemented as a result of a code of welfare would likely also be to the benefit of industry, as good welfare has been linked to higher levels of productivity and better flesh quality.[1311]

1306 *Aquaculture Risk Management Options* (Ministry for the Environment, 2007) at 2.1.1 <https://www.mfe.govt.nz/publications/marine/aquaculture-risk-management-options/2-aquaculture-industry-new%C2%A0zealand>

1307 Examples include pāua pearls, scallops, snapper, crayfish, prawns and kina (Raewyn Peart *Farming the Sea: Marine Aquaculture within Resource Management System Reform* (Environmental Defence Society (EDS) 2019) at 74.

1308 Fish are included under the definition of animal in s 2 of the AWA 1999 and one of the purposes of the Act is to recognise that animals are sentient.

1309 The existence of a parallel regime under the Fisheries Act 1996 may be a contributing factor as to why farmed fish have thus far not received their own code. However, this Act does not attend to animal welfare specifically and is more focussed on providing for "the utilisation of fisheries resources while ensuring sustainability", Fisheries Act 1996, s 8(1).

1310 Email from Mark Preece of New Zealand Salmon Farmers Association, 23 March 2020.

1311 As the OIE Aquatic Animal Health Code, Article 7.1.1(1)(c) states "improvements in farmed fish welfare can often improve productivity and lead to economic benefits". Similarly, the National Aquaculture Council, "Aquatic Animal Welfare Guidelines: Guidelines on Welfare of Fish and Crustraceans in Aquaculture and/or in Live Holdings Systems for Human Consumption" (National Aquaculture Council of Australia, 2004) at [1.1.4] state: "Consideration of welfare parameters both during growout and especially at the time of harvest can produce tangible improvements in quality of the final product. It has been shown that high levels of stress pre-harvest result in a greater depletion of muscle energy reserves and the induction of a more intense rigor mortis a shorter time after death. Limited crowding intensity pre-harvest is known to produce firmer flesh, less bruising, less scale loss and decreased incidence of gaping. … The careful control of crowding combined with a method of harvest that minimises time out of water and time to complete stunning will result in prolonged time to rigor mortis, with associated improvements in flesh quality, processing performance and shelf life." See also Fisheries Society of the British Isles "Fish Welfare Briefing Paper 2" (2002) at 4 ("poor welfare of farmed fish often equates to poor production"). Similarly, Felicity A. Huntingford & Sunil Kadri "Taking Account of Fish Welfare: Lessons from Aquaculture" (2009) 75 Journal of Fish Biology 2862, at 2866 state "… interventions that promote welfare often also promote production and farmers can carry on business even with tight welfare regulation."

In addition, the Code of Welfare (Commercial Slaughter) 2018 currently permits farmed finfish and fish caught in the wild to be killed without first being rendered insensible. This has the potential to cause immense suffering and is especially concerning given the extent of New Zealand's fishing industry and recreational fishing in New Zealand, with approximately 239,512 tonnes of wild fish harvested in 2018 by commercial fisheries,[1312] and an estimated 7 million finish caught by recreational fishers in New Zealand annually.[1313]

We make a number of recommendations in this chapter:

- **A Code of Welfare for Farmed Fish:** We recommend that a code of welfare be developed for farmed fish that includes mandatory minimum standards regarding the careful handling of fish when graded, transported and for the purposes of breeding; stocking densities that do not lead to overcrowding and thus physical, health and behavioural issues in fish; adequate holding facilities; measures to reduce the incidence of bone deformities in fish (which is currently a common health problem in Chinook salmon in New Zealand); guidelines around the use of vaccinations and veterinary medicines; adequate food to be provided to fish; adequate water quality (e.g. in terms of temperature, oxygen, CO_2 levels, pH, salinity and nitrogenous wastes); and sufficient lighting provided to ensure the physical, health and behavioural needs of fish are met. There is a draft RNZSPCA blue tick standard for farmed fish and a model for overall welfare assessment of caged Atlantic salmon (developed by Stien et al)[1314] that could act as starting points for this code of welfare.
- **Requirement That Farmed Fish and Fish Caught in the Wild be Rendered Insensible Prior to Being Killed:** We have found that revisions to the Act and the Code of Welfare (Commercial Slaughter) 2018 are necessary so as to prevent farmed finfish and fish caught in the wild from being killed without first being rendered insensible. That fish can currently be slaughtered in this way is patently inhumane and the Act and code have to be amended to change this.

In relation to the development of a code of welfare for fish, Kate Littin of MPI stated:[1315]

> NAWAC has identified fish welfare as a priority for its work programme. We don't yet know the scope of this work, but the Committee monitors the literature on fish welfare issues, including caught wild fish.

NAWAC's work programme outlines that it is "to learn about aquaculture in New Zealand in order to inform next steps."[1316] It is unclear what is involved in NAWAC's monitoring of the literature on fish welfare issues and how it plans to learn about aquaculture in New Zealand. However, NAWAC has identified an "increasing need to develop a new code of welfare for fish"[1317] and outlined a timeframe for this of 1-3 years.[1318] While this is a positive development, NAWAC had already identified in 2015 that "Farmed fish have been on NAWAC's work programme for a long time, but it is consistently pushed back onto 'next year's programme'."[1319]

1312 "Situation and Outlook for Primary Industries (SOPI) data – Export forecast and historical statistics" (Ministry for Primary Industries, current as at March 2020) <https://www.mpi.govt.nz/news-and-resources/open-data-and-forecasting/situation-and-outlook-for-primary-industries-data/>

1313 Ministry for Primary Industries "National survey of recreational fishers" (28 August 2019) <https://www.mpi.govt.nz/travel-and-recreation/fishing/national-survey-of-recreational-fishers/>

1314 Lars H. Stien, Marc B. M. Bracke, Ole Folkedal, Jonatan Nilsson, Frode Oppedal, Thomas Torgersen, Silje Kittilsen, Paul J. Midtlyng, Marco A. Vindas, Øyvind Øverli and Tore S. Kristiansen "Salmon Welfare Index Model (SWIM 1.0): a semantic model for overall welfare assessment of caged Atlantic salmon: review of the selected welfare indicators and model presentation" (2013) 5 Rev Aquacult 33.

1315 Email from Kate Littin, 4 March 2020.

1316 National Animal Welfare Advisory Committee, above n 542

1317 National Animal Welfare Advisory Committee, above n 324, at 1

1318 At 1

1319 National Animal Welfare Advisory Committee Minute, above n 310, at [C 10]

We note that there is an advantage to the lack of a code of welfare for fish, in that the treatment of farmed fish technically has to be in accordance with the standard under the Act of meeting the 'physical, health and behavioural needs' of animals. With no code of welfare, there are no defences available to legitimise practices that would otherwise fall below this standard. In spite of this we still recommend the development of a code to provide a set of clear standards to industry. However, it is crucial that such a code facilitates good standards of welfare (including providing for the behavioural needs of fish) as opposed to legitimising poor practices.

8.2 FISH SENTIENCE

MPI defines sentience on its website as "the ability to perceive or feel things."[1320] Similarly, NAWAC has defined sentience as "the ability to feel, or perceive, or be conscious, or have subjective experiences as distinct from the ability to reason."[1321] Animal sentience is recognised in the Long Title of the Act and underpins the Act's provisions, such as the requirement to meet the 'physical, health and behavioural' needs of animals.[1322] Moreover, the Act recognises that fish are sentient.[1323] As such, there is no apparent reason why farmed fish should not have a code of welfare similar to their terrestrial equivalents.

The historic presumed lack of sentience in fish has ostensibly been an underlying rationale for the lack of a code of welfare. For instance, scientific studies from 2002, 2007 and 2012 on fish sentience by Rose and others argued that claims fish are sentient were unsubstantiated.[1324] These studies argued that fish pain responses were limited, and that it is unlikely they could experience a human-like ability to feel pain.[1325] In particular:[1326]

> Rose argues that it is critical to distinguish nociception from the conscious experience of pain, which requires higher-order mental processing. In his view, this requires an adequately developed forebrain neocortex, something that fish simply do not have, and there is no evidence to suggest that an alternative structure allows for such processing.

However sentience in fish has now been well proven. In 2015 Culum Brown conducted a study in which he concluded that:[1327]

> …the level of cognitive complexity displayed by fishes is on a par with most other vertebrates, and that if any animals are sentient then one must conclude that fish are too.

Brown canvassed numerous studies, which demonstrated that fish are complex beings, sensitive to their environment and able to perform complex tasks. Such tasks include the deployment of the senses such as vision, hearing, olfaction and other senses; learning and memory; social learning and traditions; self-recognition; social intelligence in terms of cooperation and reconciliation; building and

1320 Ministry for Primary Industries, above n 164
1321 National Animal Welfare Advisory Committee, above n 165, at 5
1322 Animal Welfare Act 1999, Long Title and s 9, respectively
1323 The Animal Welfare Act 1999 includes fish in the definition of animals at s 2. The Long Title of the Act then states it is an Act "to reform the law relating to the welfare of animals… and in particular… to recognise that animals are sentient."
1324 J D Rose, R Arlinghaus, S J Cooke, B K Diggles, W. Sawynok, E D Stevens and C D L Wynne "Can fish really feel pain?" (2014) 15(1) Fish Fish 97
1325 Rose et al, above n 1325
1326 Celeste Black "The Conundram of Fish Welfare" in P Sankoff (2nd ed) *Animal Law in Australasia: Continuing the Dialogue* (Federation Press, 2013) 245 at 250.
1327 Culum Brown "Fish intelligence, sentience and ethics" (2015) 18 Anim Cogn 1 at 14

tool use and numerical competency. Lateralisation of brain function (i.e. where certain mental processes are specialised to one side of the brain or the other) illustrates that fish can perform multiple complex tasks simultaneously. Brown went on to consider a number of studies relating to pain perception and consciousness in fish, which demonstrated that fish learn to associate certain objects, smells and contexts with potential harm; that they are cognitively affected by pain, in that it distracts them from carrying out other tasks or paying attention to external stimuli; and that they will use analgesics to alleviate pain even if that comes at cost to themselves.[1328]

These findings contradicted previous studies, which had asserted that fish do not have the cognitive complexity to respond to pain in an emotional sense because they lack a neocortex.[1329] Brown's response was that the pain receptors in fish are actually remarkably similar to those in humans, and that it would be impossible for fish to survive as the "cognitively and behaviourally complex animals they are without a capacity to feel pain."[1330] Brown concluded that this body of evidence "strongly suggests that [fish] are sentient" [1331] and that "the evidence that they are capable of feeling pain in a manner similar to humans is gradually mounting.[1332]

Biologist Jonathan Balcombe has contended there are good reasons to believe fish are sentient given that, as vertebrates, they have the same basic body plan as mammals, including a peripheral nervous system.[1333] Balcombe disagreed with authors who argued that a neocortex is required to be sentient, pointing to the fact that birds do not have them but are universally accepted as being conscious and aware. [1334] He also reviewed a number of studies in trout and zebrafish, which suggested that these animals can feel pain. These studies related to fish memory in relation to the location of noxious stimuli; cognitive impairment in fish, when given pain inducing chemicals, which was then reversed when the fish received pain medication; and the implications of fish injected with pain-inducing acid preferring to swim in a dark and barren chamber containing pain medication as opposed to an enriched environment, which they would normally prefer.[1335]

Balcombe and Brown are supported by Professor Donald Broom, who has argued that "anatomically, physiologically and biologically, the pain system in fish is virtually the same as in birds and mammals",[1336] and by Professor Victoria Braithwaite who has "argued that there is as much evidence that fish feel pain and suffer as there is for birds and mammals – and more than there is for human neonates and preterm babies."[1337]

Some commentators argue that in this context the precautionary principle should be applied, meaning that a lack of full scientific certainty as regards fish sentience "should not be used as a reason for postponing

1328 At 13
1329 Rose et al, above n 1325
1330 Brown, above n 1328, at 13
1331 Brown, above n 1328
1332 Brown, above n 1328
1333 Extract from Jonathan Balcombe *What a Fish Knows: The Inner Lives of Our Underwater Cousins* (Oneworld Publications, 2016), Jonathan Balcombe "Do Fish Feel Pain" (19 July 2017) Nature <https://www.pbs.org/wnet/nature/blog/fish-feel-pain/>
1334 Balcolmbe, above n 1334
1335 Jonathan Balcombe "What a Fish Knows" (Presentation at the New Zealand Animal Law Association 2019 Animal Law Conference, 28 September 2019)
1336 Professor. Donald Broom, Professor of Animal Welfare at Cambridge University, Daily Telegraph, October 19, 1995
1337 Victoria Braithwaite *Do Fish Feel Pain?* (Oxford University Press, New York, 2010) at 153

measures to prevent the possibility of serious negative animal welfare outcomes."[1338] To similar effect, Culum Brown has argued that the "extensive evidence of fish behavioural and cognitive sophistication and pain perception suggests that best practice would be to lend fish the same level of protection as any other vertebrate."[1339] Given the scale of New Zealand's seafood industry and the evidence supporting the proposition that fish are sentient, clearly there would be a 'serious negative animal welfare outcome' in failing to extend legislative protections to fish.

That the Act accepts fish are sentient reflects increased acceptance throughout society that fish can feel pain. For example, in a 2013 public survey in New Zealand, a majority of respondents believed that fish have the capacity to feel pain.[1340] Mark Preece- of the New Zealand Salmon Farmers Association stated in our interview that fish are just "as advanced as humans… or any other animal."[1341]

However, the current legislative regime fails to provide fish, whether farmed fish or fish caught in the wild, with the same levels of protection as terrestrial animals.

1338 Jonathan Birch "Animal sentience and the precautionary principle" (2017) 2(16) Animal Sentience at 3. Other proponents of the precautionary principle within this context and particularly in regards to fish include Wise, S "Animal Rights, One Step at a Time" in Sunstein, CR and Nussbaum, MC (eds) *Animal Rights: Current Debates and New Directions* (Oxford University Press, New York, 2004) 19 at 36-38; Timothy O'Riordan and James Cameron Interpreting the precautionary principle (Earthscan, London, 1994).; Bradshaw, R. H. "Consciousness in non-human animals: adopting the precautionary principle" (1998) 5 J. Conscious. Stud. 108.; Paul L.R. Andrews "Laboratory invertebrates: Only spineless, or spineless and painless?" (2011) 52 ILAR Journal 121; Jones, R.C. "Fish sentience and the precautionary principle" (2016) 3 Animal Sentience.Seth, A.K. "Why fish pain cannot and should not be ruled out" (2016) 3 Animal Sentience; Brown, C. "Fish pain: An inconvenient truth" (2016) 3 Animal Sentience; Sneddon, L.U., Elwood, R. W., Adamo, S. A. and Leach, M. C. "Defining and assessing animal pain. Animal Behaviour" (2014) 97 Anim. Behav. 201.

1339 Brown, above n 1328 at 1

1340 Ministry for Primary Industries *Welfare Pulse* (Issue 16, December 2013) at 13 citing 'Attitudes towards catch and release fishing', Muir, R., et al. (2013). Animal Welfare 22, 323-329.

1341 Interview with Mark Preece, above n 68

8.3 WELFARE ISSUES FOR FARMED FISH

There are a range of welfare considerations relevant to fish bred and raised in captivity, including in relation to how fish are handled, stocking density, holding facilities, bone deformities, veterinary medicines, food, water quality and lighting. The provision of guidance in relation to these parameters is necessary.

8.3.1 HANDLING

Farmed fish are handled in a variety of circumstances, for example in order to provide vaccinations; to sort and separate fish by size i.e. grading; to load and transport fish; to 'tag' fish so as to identify individuals within the group (e.g. for disease surveillance purposes); and for the purposes of breeding fish. The Humane Slaughter Association has stated that handling and movement prior to slaughter "can cause stress and chemical and physical deterioration in product quality."[1342]

Mark Preece of New Zealand Salmon Farmers Association considered that the handling of farmed fish is not regarded as a major issue in New Zealand. Preece stated that grading is required because of the need to harvest fish as they are the first to reach market size[1343] (grading is the practice of sorting fish into similar individual sizes). Further, "in the aquaculture environment you're trying to make sure that every fish has access to food, space, all those sorts of things to maximise its growing potential."[1344] He informed us that farms measure blood cortisol levels and parameters in stress response hormones at the beginning and end of the grading process when setting up what this process will look like into the future, so as to minimise pain and stress in fish.[1345] However it is unclear how universal this practice is within the industry.

There are no guidelines in New Zealand in relation to fish handling, aside from the general provisions outlined in the Code of Welfare (Transport) 2018. While this Code states that it is consistent with the World Organisation for Animal Health (OIE) *Aquatic Animal Health Code*,[1346] it mentions aquatic animals only once[1347] and the "vast majority of standards in the *Transport Code* appear to be drafted with terrestrial animals in mind."[1348]

By contrast, the OIE Aquatic Animal Health Code provides a far wider range of specific provisions in relation to the handling of fish, for example that "Fish should be unloaded, transferred and loaded under conditions that minimise injury and stress to the fish."[1349] It also contains provisions in relation to water quality (to be assessed on arrival of fish prior to their unloading and corrective action taken if required); injured or moribund fish being separated and killed humanely where possible; the crowding of fish being as short and infrequent as possible; handling of fish during transfers being minimised and fish preferably not being handled out of water; where fish need to be removed from water this period being as short as possible; allowing fish to swim directly into a stunning device without being handled where feasible; equipment used to handle fish being designed, constructed and operated to minimise physical injuries;

1342 Humane Slaughter Association "Humane slaughter of finfish farmed around the world" (February 2018) at 1
1343 Interview with Mark Preece, above n 68
1344 Interview with Mark Preece
1345 Interview with Mark Preece
1346 Code of Welfare (Transport) 2018 at 4.
1347 Minimum Standard No. 2, Example Indicator. "Water quality in tanks holding aquatic animals is monitored and oxygen, carbon dioxide and ammonia, pH, temperature and salinity are maintained within the range appropriate for the species."
1348 Bianka Atlas, "Balancing the Scales: The Welfare of Fish in New Zealand Aquaculture", (LLM Dissertation, Lewis & Clark Collage, 2020) at 58.
1349 OIE Aquatic Animal Health Code, Article 7.3.5(1).

and the provision of a contingency plan to address emergencies and minimise stress.[1350] Such guidance is important as loading and unloading fish can cause acute stress, immune suppression and immediate death.[1351]

Notably, the OIE Aquatic Animal Health Code is intended to set minimum standards that all 181 member countries are required to follow, as opposed to higher or ideal standards to aim for. Thus, if New Zealand is falling below these standards, this is quite concerning.

8.3.2 STOCKING DENSITY

High stocking densities and consequent overcrowding is another potential issue for farmed fish. Overcrowding may lead to stress (relating to competition for food); cannibalism;[1352] lesions; fin damage; an increased incidence of disease; and parasite outbreaks (e.g. sea lice) that need to be treated with pesticides and antibiotics.[1353] Compassion in World Farming has stated that high stocking densities in salmon may lead to increased aggression levels; decreased water quality; increased susceptibility to disease; an increased incidence of physical injuries and poor body condition; increased stress; and reduced growth rate, feed intake and feed conversion efficiency.[1354] Poltronieri *et al*. similarly found a link between overcrowding and stress in farmed fish.[1355]

It is unclear exactly what an appropriate stocking density for farmed fish might be. For example, in relation to Atlantic salmon MPI stated in 2013:[1356]

> There is a large variation in recommended optimal stocking densities for marine farmed Atlantic salmon from ~10 kg m^3 to 27 kg m^3. This large variation in optimal stocking density is primarily because the effect of stocking density on the growth and performance of fish is also affected by other factors such as food availability…water temperature and quality…tank cleaning disturbance…and utilised net-pen volume.

However, MPI appears to have considered 'optimal density' here only in terms of production rather than animal welfare. Similarly, Oppendal *et al*. found that maximum stocking density for Atlantic Salmon should be 27 kg/m^3, however this study related to maximum stocking density in relation to optimal growth, rather

1350 Article 7.3.5(2)

1351 *Welfare of Farmed Fish: Common Practices During Transport and At Slaughter* (EU Commission, 2017) at 5 <https://ec.europa.eu/food/sites/food/files/animals/docs/aw_platform_20180621_pre-06.pdf>

1352 Alison Mood "Worse things happen at sea" (2010) Fishcount <http://fishcount.org.uk/farmed-fish- welfare/rearing-conditions-for-farmed-fish> at 103

1353 Animal Welfare Institute "Fish Farming" <https://awionline.org/content/fish-farming>

1354 Compassion in World Farming, above n 897, at 7 -8

1355 Carlo Poltronieri, Rosaria Laura, Daniela Bertotto, Elena Negrato, Claudia Simontacchi, Maria Cristina Guerrera, Giuseppe Radaelli "Effects of exposure to overcrowding on rodlet cells of the teleost fish *Dicentrarchus labrax* (L.)" (2009) 33 Vet. Res. Commun. 619

1356 *Comparison of the international regulations and best management practices for marine finfish farming* (Ministry for Primary Industries, MPI Technical Paper No: 2013/47, October 2013) at 14

than prioritising animal welfare per se.[1357] Turnbull *et al*. recommended a maximum stocking density of 22 kg/m^3 to ensure fish welfare (as measured by blood glucose, cortisol, fin and body condition).[1358] Conversely, authors such as Adams *et al*. have argued that Atlantic salmon cultured at 25 kg/m^3 showed less aggressive behaviour and had higher welfare scores than fish cultured at 15 kg/m^3, suggesting that *higher* stocking densities may be better for fish welfare[1359] (this may be because higher stocking densities induce schooling behaviour, which reduces aggression).[1360]

Additionally, it is unclear how these studies might apply to Chinook salmon, which is the only breed of fish farmed in New Zealand.[1361] Mazur and Iwama found that Chinook salmon held at 8 kg/m^3 had significantly longer survival times and lower cortisol concentrations than those held at 32 kg/m^3 or 64 kg/m^3.[1362] And Chile has implemented a maximum stocking density of 10 kg/m^3 for Chinook salmon.[1363] However, few studies have been undertaken in relation to Chinook salmon specifically. More research is needed to determine appropriate stocking densities that ensure the health, physical and behavioural needs of farmed fish are met.

Mark Preece of the New Zealand Salmon Farmers Association stated that New Zealand sits somewhere within a range of "less than 1 kg/m^3 up to around 25 kg/m^3 (depending on the life stage of the salmon)."[1364] However, there is no legislated maximum stocking density to provide guidance on this, or to ensure that New Zealand producers do not exceed this range. This could lead to uncertainty both for farmers and consumers. For example, Jessica Wilson of Consumer New Zealand has stated in relation to salmon farming in New Zealand that it is "intensive farming that sits at odds with the 'natural' claims made for products found in stores."[1365] Conversely, Mark Preece of New Zealand Salmon Farmers Association disputes that overcrowding is an issue in New Zealand salmon farming:[1366]

> …you'd probably need to come close to doubling the density to create an issue with the animal… if you look at the animal that's harvested, let's say 17 kilos per metre cubed…you cannot measure any stress hormones or any other elevated stress hormones, you can't see any visible signs of any damage that are associated with the density of the fish. So that gives you an indication that you're operating within a range that the density is appropriate.

Preece similarly stated that the:[1367]

> …average harvest density in New Zealand would be…between 10 and 20 [salmon] per metre cubed…at harvest that means you've got 2% of your volume of water is made of fish, and the remainder sort of 98% is all water.

1357 Oppedal, F.; Vågseth, T.; Dempster, T.; Juell, J.E.; Johansson, D. "Fluctuating sea-cage environments modify the effects of stocking densities on production and welfare parameters of At lant ic salmo n (Salmo salar L.)." (2011) 315 Aquaculture 361 cited in Ministry for Primary Industries, above n 1357

1358 Turnbull, J.; Bell, A.; Adams, C.; Bron, J.; Huntingford, F. "Stocking density and welfare of cage farmed Atlantic salmon: application of a multivariate analysis." (2005) 243 Aquaculture 121 cited in Ministry for Primary Industries, above n 1357

1359 Adams, C.E.; Turnbull, J.F.; Bell, A.; Bron, J.E.; Huntingford, F.A. "Multiple determinants of welfare in farmed fish: Stocking density, disturbance, and aggression in At lant ic salmo n (Salmo salar)" (2007) 64 Can J Fish Aquat Sci 336 cited in cited in Ministry for Primary Industries, above n 1357

1360 T. Hastein, A.D. Scarfe and V.L. Lund, "Science-based assessment of welfare: aquatic animals" (2005) 24 Rev. sci. tech. Off. int. Epiz 529 at 536

1361 Email from Mark Preece of New Zealand Salmon Farmers Association, 24 March 2020

1362 C.F. Mazur and G.K. Iwama "Effect of handling and stocking density on haematocrit, plasma cortisol, and survival in wild and hatchery-reared chinook salmon (Oncorhynchus tshawytscha)" (1993) 112 Aquaculture 291

1363 Rodrigo Orrero "New regulation on stocking densities Looking at the individual and collective performance" (19 June 2015) FishFarmingExpert <https://www.fishfarmingexpert.com/article/new-regulation-on-stocking-densities-looking-at-the-individual-and-collective-performance/>

1364 Interview with Mark Preece, above n 68. This is also stated by Ministry for Primary Industries, above n 1357

1365 Jessica Wilson "Farmed salmon" (6 October 2013) Consumer <https://www.consumer.org.nz/articles/farmed-salmon>.

1366 Interview with Mark Preece, above n 68

1367 Interview with Mark Preece, above n 68

The Code of Welfare (Commercial Slaughter) 2018 does refer to stocking densities, however it only sets a broad and vague requirement that when finfish (including eels), crabs, rock lobsters (crayfish) and freshwater crayfish (Kōura) are held in tanks, they must "not be overcrowded to the extent that their welfare is compromised."[1368]

8.3.3 HOLDING FACILITIES

There is minimal provision made in the Code of Welfare (Commercial Slaughter) 2018 for holding facilities in relation to fish. Minimum standard 21 (Farmed and Wild-captured Finfish (including Eels) provides that "Fish pumps, brailing equipment, nets and other fish handling equipment must be designed, maintained and used in a manner that minimises harm to the live finfish."[1369] However, there is no such provision included in relation to crabs, rock lobsters or freshwater crayfish at minimum standard 22.

In contrast, the OIE Aquatic Animal Health Code provides that holding facilities should be designed and constructed to hold the fish species in question; that holding facilities should be large enough to allow for holding a certain number of fish for processing in a given timeframe without compromising fish welfare; and that consideration should be given in the design of holding facilities to minimise injury and stress to fish. The design of such holding facilities encompasses net and tank design; water quality being suitable for the particular fish species; and stocking density and equipment for transferring fish (such as pumps and pipes) being designed and maintained to minimise injury.[1370]

Cogliati *et al*. found that increasing the complexity of the rearing environment through adding artificial structures and substrates lead to decreased stress in Chinook salmon as a result of handling, suggesting that the use of such structures and substrates could be advantageous for animal welfare.[1371]

1368 Code of Welfare (Commercial Slaughter) 2018, Minimum Standard No 21 and Minimum Standard No 21(b), at 27; and No 22(c)

1369 Code of Welfare (Commercial Slaughter) 2018, Minimum Standard No 21(a) at 27

1370 OIE Aquatic Animal Health Code, Article 7.3.4

1371 Karen M. Cogliati, Crystal L. Herron, David L.G. Noakes, Carl B. Schrek "Reduced stress response in juvenile Chinook Salmon reared with structure" (2019) 504 Aquaculture 96. "In the complex tanks only, we placed two structures and six substrate blocks. Each structure unit (L × W × H in cm: 76 × 76 × 52) was made of white PVC pipes to create an 'X'. We attached strips of black plastic that floated vertically, resembling vegetation and we weighted the structure units on one end. This provided fish with ample areas for shelter while mimicking a natural habitat for juvenile salmonids. For the substrate blocks, we placed round river rock (3–8 cm in length) in 20.5 cm diameter buckets to a depth of 5 cm. We poured a 2-part resin cast over the rocks until it reached approximately a depth of 4 cm and removed the block from the buckets once dry. The height of the resin allowed for natural rock to be exposed at the surface, and an overall depth that allowed juveniles to seek shelter."

8.3.4 BONE DEFORMITIES

Bone deformities in salmon are an issue both locally and internationally, so much so that in 2013 MPI committed $600,000 to King Salmon and other members of the Salmon Improvement Group to investigate the issue.[1372] MPI has stated that this problem has "serious implications for the sustainable growth of aquaculture, animal welfare and consumer perception."[1373] Nutrition and water temperature may contribute to the development of bone deformities, with these conditions being linked to the deformities.[1374]

Subsequently, in a 2019 study funded by MPI, Davie *et al*. noted that such deformities remain "an established economic concern in Atlantic salmon"[1375] and that such issues also affect Chinook salmon. Davie *et al*. conducted two studies for this research in relation to vertebral fusions. In the first, 1.2% of smolt and 7.6% of harvest fish had vertebral fusions. In the second, 4.4%, 5.3% and 9% had fusions as smolt, after 129 days in seawater and at harvest, respectively. Perrott *et al*. (2018) similarly followed a population of farmed Chinook salmon through the production cycle to determine how many had deformities – these deformities were more broadly defined than in the Davie *et al*. study[1376] and at least one deformity was detected in 38.4% of harvest fish.[1377] Similarly, in a 2018 MPI funded study by Munday *et al*. the authors stated: "Spinal abnormalities can be detected at harvest in around 40% of farmed Chinook salmon in New Zealand."[1378]

Munday *et al*. linked such abnormalities in Chinook salmon to temperature and growth rates.[1379] Clercq *et al*. similarly found that the results of their own study suggested that "incubation and early rearing at a constant 8°C are preferable to rearing at 12°C and indicate that rearing at 4°C results in unacceptable frequencies of body axis malformation."[1380] Davie *et al*. further studied free-living Chinook salmon released into the Waimakariri River. The authors found that although these free-living salmon frequently developed spinal abnormalities (with abnormal vertebral bodies found in 88.1% of the free-living fish in this study), these abnormalities were less severe than those seen in farmed salmon.[1381]

Given the prevalence of bone deformities in farmed fish, this issue should also be addressed in a code of welfare for fish.

1372 Michael Field "King salmon gets government money" (7 May 2013) Stuff <http://www.stuff.co.nz/business/industries/8642187/King-Salmon-gets-government-money>

1373 Wilson, above n 1366

1374 Wilson, above n 1366

1375 P.S. Davie, S.P. Walker, M.R. Perrott, J.E. Symonds, M. Preece, B.A. Lovett, J.S. Munday "Vertebral fusions in farmed Chinook salmon (Oncorhynchus tshawytscha) in New Zealand" (2019) 42 J Fish Dis 965-974 at 965.

1376 They included spinal curvature or Lordosis, Kyphosis, Scoliosis (LKS); fusion; compression and/or reduced inter-vertebral (IV) space and Vertical shift.

1377 M.R. Perrott, J.E. Symonds, S.P. Walker, F.S. Hely, B. Wybourne, M.A. Peece, P.S. Davie "Spinal curvatures and onset of vertebral deformities in farmed Chinook salmon, Oncorhynchus tshawytscha (Walbaum, 1792) in New Zealand" (2018) 34 J Appl Ichthyol 501.

1378 J.S. Munday, M.R. Perott, J.E. Symonds, S.P. Walker, M.A. Preece, P.S. Davie "Prevalence of spinal abnormalities in Chinook salmon smolt and influence of early rearing temperature and growth rates" (2018) 41 J Fish Dis 1111.

1379 Munday et al, above n 1379

1380 A.D. Clercq, M.R. Perrott, P.S. Davie, M.A. Preece, A Huysseune, P.E. Witten "The external phenotype–skeleton link in post-hatch farmed Chinook salmon (Oncorhynchus tshawytscha)" (2018) 41 J Fish Dis 511 at 524.

1381 P.S. Davie, S.P. Walker, M.R. Perrott, J.E. Symonds, M. Preece, A.D. Clercq , J.S. Munday "Vertebral abnormalities in free-living Chinook salmon (Oncorhynchus tshawytscha, Walbaum) in New Zealand" (2018) 52 NZ Journal of Marine and Freshwater Research 444.

8.3.5 VACCINATIONS AND VETERINARY MEDICINES

A study conducted on commercially produced salmon in Norway demonstrated that "vaccinated fish show less interest in food and less interest in performing social behaviours than control fish, especially on the day of the vaccination."[1382] This study implies that vaccinations may cause pain in fish. While vaccinations can be effective for preventing diseases, the vaccinations themselves may "pose a threat for fish welfare through increased handling, causation of inflammation in the body part injected and occasional subsequent deformations of the spine."[1383]

Although salmon farms in New Zealand do not currently use vaccinations, there is nothing preventing them from doing so in the future, and at present there are no guidelines that would regulate the practice.

A 2010 review by MPI did find that "salmon hatcheries routinely use veterinary medicines in their breeding programmes and listed a hormone-inducing agent (GnRHa) and testosterone (17-methyl testosterone)."[1384] Again, there are no rules or guidelines regulating the administration of such medicines.

8.3.6 FOOD

In the wild, young salmon eat zooplankton and small invertebrates, while adults eat smaller fish like herring or krill.[1385] In contrast, farmed salmon in New Zealand consume mostly:[1386]

> …abattoir by-products – off-cuts from poultry processing, including feather meal, as well as bloodmeal from cattle, pigs and sheep…unlike wild salmon, farmed salmon derive only a small proportion of their diet from marine sources.

This food is provided in pallet form as this avoids creating a "bacterial ridden environment or a dirty environment for the animal."[1387] These pallets are fed to the fish until the point of satiety, between five and ten times a day (depending on the size of the fish). Mark Preece of New Zealand Salmon Farmers Association cited this as a good example of sustainability, with the waste products of another industry being put to good use. However, it is not clear that this method of feeding is sufficient to meet the nutritional needs of salmon.

Gasco *et al*. found that the use of poultry by-products as salmon feed has "been widely studied and the improvement of quality due to better processing technologies allows high levels of [fish meal] replacement."[1388] However, Foroutani *et al*. tested a range of diets on farmed salmon and found that "the diet with the lowest fish meal and fish oil content resulted in the lowest weight gain and final weight."[1389] The authors noted that diets containing low levels of fish meal and fish oil had a minimal impact on fatty acid content in fish and stated that "Fish meal could be reduced to 5% without affecting growth as long as

1382 Ministry for Primary Industries, above n 792, at 20, citing Bjørge, M.H., Nordgreen, J., Janzak, A.M. "Behavioural changes following intraperitoneal vaccination in Atlantic salmon (Salmo salar)" 133 Appl. Anim. Behav. Sci. 127.

1383 J. Bergqvist and S. Gunnarsson, "Finfish Aquaculture: Animal Welfare, the Environment, and Ethical Implications" (2013) 26 J Agric Environ Ethics 75 at 79

1384 Wilson, above n 1366

1385 Ryn Gargulinski "What do salmon eat?" (22 November 2019) Sciencing <https://sciencing.com/what-do-salmon-eat-4621298.html>

1386 Wilson, above n 1366

1387 Interview with Mark Preece, above n 68

1388 L. Gasco, F. Gai, G. Maricchiolo, L. Genovese, S. Ragonese, T. Bottari, G. Caruso *Feeds for the Aquaculture Sector: Current situation and alternative sources* (Springer, Switzerland, 2018) at 13.

1389 M.B. Foroutani, C.C. Parrish, J. Wells, R.G. Taylor, M.L. Rise, F. Shahidi "Minimizing marine ingredients in diets of farmed Atlantic salmon (Salmo salar): Effects on growth performance and muscle lipid and fatty acid composition" (2018) 13 PLoS One at 1

there was a minimum of 5% fish oil, and animal by-products did not exceed 26% of the diet."[1390] Similarly, when the content of animal by-products and vegetable oil in the diet did not exceed 26% and 22%, respectively, "most growth, lipid class, and fatty acid parameters remained unaffected."[1391]

In addition, feed may sometimes be decreased or withheld from fish to slow growth rates in response to market conditions[1392] and prior to transportation to decrease waste build-up in holding facilities.[1393] Starvation to empty the gut prior to slaughter has been deemed acceptable by commentators, as long as the fasting period is kept as short as possible (one to three days).[1394] However, prolonged periods of starvation may lead to aggression resulting in physical injury to fish,[1395] and contravenes s 4(a) of the Act, which requires animals to be provided with proper and sufficient food.[1396]

Finally, the feeding schedule for farmed salmon also needs to be considered. As Atlas notes:[1397]

> The feeding schedule and methods are also important; improper feeding routines may induce aggression and stress, and prevent some individuals from accessing sufficient food. In the wild, salmon exhibit a daily rhythm of feeding, as well as marked change in feeding behavior between their fresh water and sea water life stages. The extent to which this is, or can be, replicated in farmed salmon and the impact on their welfare is unknown and more research is needed in this area.

There are currently no legislated guidelines as to what kind of feed farmed fish should be consuming and in what form, or how often fish should be fed in order to meet their nutritional and behavioural needs. A code of welfare for farmed fish should address these issues.

1390 At 1
1391 At 11
1392 Tore Hastein, "Animal welfare issues relating to aquaculture" (paper presented at the Global Conference on animal welfare: an OIE initiative, Paris, 23-25 February 2004) at 221
1393 J.A. Lines and J. Spence, "Humane harvesting and slaughter of farmed fish" (2014) 33 Rev. sci. tech. Off. Int. Epiz 255 at 256
1394 Hastein, above n 1393, at 256
1395 At 221
1396 Animal Welfare Act 1999, s 4(a)
1397 Atlas, above n 1349, at 29

8.3.7 WATER QUALITY

Mark Preece of New Zealand Salmon Farmers Association stated that water quality is an important factor in achieving desirable animal welfare for farmed fish, both in terms of temperature, and ensuring that the water is not impacted by pollutants from land run-off.[1398] It is also important that the level of build-up of nitrogenous waste products produced by fish in the water they live in is managed appropriately, taking into account stocking density, feeding frequency/volume and degree of water circulation and filtration. Hastein notes:[1399]

> Chronic stress from poor water quality may result in loss of homeostasis, reduced growth and reduced disease resistance (89). Reduced water circulation may induce aggression, heterogeneous growth and increased susceptibility to disease (122, 136).

Other factors relating to water include oxygen and CO_2 levels, salinity, pH and adequate water flow.[1400] For example, a neutral pH of between 6.5 and 9.0 has been recommended by some organisations.[1401] Low flow rates (along with high temperatures and the occurrence of certain bacteria) have been linked to a spate of high mortality rates for salmon in the Marlborough Sounds in New Zealand since 2012[1402] to the tune of 1,000 tonnes.[1403] Halstein stated, "reduced water circulation may induce aggression, heterogeneous growth and increased susceptibility to disease."[1404]

The Code of Welfare (Commercial Slaughter) 2018 currently provides that crabs, rock lobsters and freshwater crayfish "held in a tank containing water must be supplied with natural or artificial seawater that is fresh, filtered and aerated."[1405] Additionally, the Code of Welfare (Transport) 2018 provides in relation to conveyances and containers used for transporting animals that "Water quality in tanks holding aquatic animals is monitored and oxygen, carbon dioxide and ammonia, pH, temperature and salinity are maintained within the range appropriate for the species."[1406]

There are no other requirements regarding water quality for farmed fish, in particular for farmed finfish.

1398 Interview with Mark Preece, above n 68

1399 Hastein et al, above n 1361, at 535

1400 OIE Aquatic Animal Health Code at Article 7.3.5(2)(a).

1401 E.g. by ThermoFisher Scientific "Water Quality & Aquaculture" <https://www.thermofisher.co.nz/Uploads/file/Resources/water_quality_aquaculture.pdf> at 1 and New Zealand King Salmon "Takaka Salmon Farm Water Take and Discharge" <http://www.lbaaf.co.nz/assets/SFF-Models/Landbased-Aquaculture-Application-Appendix-17-5-cont.pdf> at 31

1402 Mike Watson, "Multiple factors responsible for Marlborough salmon farm deaths" (20 April 2016) Stuff <https://www.stuff.co.nz/business/farming/aquaculture/79129283/multiple-factors-responsible-for-marlborough-salmon-farm-deaths>

1403 Emma Hatton, "Thousand tonnes of dead fish poses problem for King Salmon" (15 May 2018), Radio New Zealand <https://www.rnz.co.nz/news/national/357367/thousand-tonnes-of-dead-fish-poses-problem-for-king-salmon>

1404 Hastein et al, above n 1361, at 536

1405 Code of Welfare (Commercial Slaughter) 2018, Minimum Standard No 22(a) and (b)

1406 Code of Welfare (Transport) 2018, Minimum Standard No. 2, Example Indicator

8.3.8 LIGHTING

Boeuf and Le Bail found that light has an impact on fish growth. They stated that many studies have shown that fish species need a minimal amount of light to be able to develop normally; that light is indispensable for body pigmentation (an important aspect of early development and growth); that too intense light can be stressful or even lethal; and that lighting may impact on hormone levels.[1407] Conversely, constant light has been found to have a negative effect on the neurological development of young Atlantic salmon,[1408] and to lead to an extended period of appetite depression (for six – eight weeks) leading to reduced growth.[1409]

Within the context of laboratory-held fish, Williams *et al*. stated that a timed transition at dawn and dusk periods eliminates potential stress to fish from sudden changes in light intensity and helps to maintain healthy brood stock, with day length triggering seasonable spawning in many species. The authors also recommended the use of 'daylight' bulbs to produce a more natural light spectrum and thus provide a more natural environment for fish.[1410] Håstein *et al*. summarised a number of studies relating to aquatic animal welfare and stated:[1411]

> Photoperiodicity and artificial light, used to increase production and observe the animals, often result in a reduced feed uptake in Atlantic salmon (Salmo salar) during the first 6 to 12 weeks after the lighting change, suggesting stress. Power failure and sudden transitions from light to dark may induce stress responses, panic reactions and mortality (85). The position of the lighting influences swimming depth and fish density, and darkness may result in crowding, sub-optimal oxygen levels and fin erosion (72).

Similarly, Huntingford and Kadri stated "strategically placed underwater lights can be used to encourage fish to use more of the available space, thereby reducing crowding…"[1412]

Mark Preece of the New Zealand Salmon Farmers Association stated: "all salmon in NZ have access to natural light."[1413] However, there are no standards requiring this. Nor are there any standards regarding light intensity; a gradual transition from dusk to dawn and vice versa; that a certain amount of darkness be required per 24 hour period; or regarding the position of lighting.

1407 Gilles Boeuf "Does light have an influence on fish growth?" (1999) 177 Aquaculture 129

1408 Ebbesson, L. O., Ebbesson, S. O., Nilsen, T. O., Stefansson, S. O. & Holmqvist, B. "Exposure to continuous light disrupts retinal innervation of the preoptic nucleus during parr–smolt transformation in Atlantic salmon" (2007) 273 Aquaculture 345

1409 Oppedal, F., Taranger, G. L. & Hansen, T. "Growth performance and sexual maturation in diploid and triploid Atlantic salmon (*Salmo salar L*.) in seawater tanks exposed to continuous light or simulated natural photoperiod." (2003) 215 Aquaculture 145; Oppedal, F., Berg, A., Olsen, R. E., Taranger, G. L. & Hansen, T. "Photoperiod in seawater influence seasonal growth and chemical composition in autumn sea-transferred Atlantic salmon (*Salmo salar L*.) given two vaccines." (2006) 254 Aquaculture 396; Hansen, T., Stefansson, S. & Taranger, G. L. "Growth and sexual maturation in Atlantic salmon, Salmo salar L., reared in sea cages at two different light regimes." (1992) 23 Aquaculture Research 275

1410 T D Williams, G D Readman, S F Owen "Key issues concerning environmental enrichment for laboratory-held fish species" (2009) 43 Lab Anim-UK 107.

1411 Hastein et al, above n 1361, at 535

1412 F. A. Huntingford and S. Kadri, "Defining, assessing and promoting the welfare of farmed fish" (2014) 33 Rev. sci. tech. Off. Int. Epiz 233 at 241

1413 Email from Mark Preece, New Zealand Salmon Farmers Association on 1 April 2020

8.4 DEVELOPMENT OF A CODE OF WELFARE FOR FARMED FISH

At present, many farms in the salmon farming industry receive certification from Best Aquaculture Practices, which does consider animal welfare issues in relation to water quality, handling, daily inspections, feed, reporting, stocking density, mortality rates and more.[1414] Many farms are also certified by the Aquaculture Stewardship Council, which has requirements to manage disease outbreaks in farmed salmon.[1415]

Mark Preece of the New Zealand Salmon Farmers Association noted that there are plans to "develop an industry-wide animal ethics guideline"[1416] that will be "all signed up to and agreed"[1417] by about the end of 2020. Although delayed by Covid-19, the Association has prepared a draft document "and are in the final throes of industry consultation."[1418]

Preece stated this project was instigated because of the desire of consumers to know that "if you're farming animals that they're kept in conditions that are appropriate… industry needs to deliver those sorts of things."[1419] Preece also noted the benefit of a code of welfare for fish for smaller operations *that may be less likely to have clear standards in place as compared to the larger corporates – or at least, may be less likely to document their practices.*[1420]

The RNZSPCA has made substantial progress in developing a blue tick standard for farmed salmon based on the five freedoms.[1421] The draft document provides standards for each of these freedoms, as well as for stockmanship, catching and transportation, slaughter, stocking density and processing. It addresses a range of welfare concerns similar to those identified above, including in relation to water quality (including poor water quality during transport); competition and aggression between fish resulting from feeding practices such as feed withdrawal prior to transport or slaughter and feed quality; fouling of nets leading to a reduction in water quality; high stocking densities (associated with higher disease risk, lower water quality, increased aggression, stress and injury); the use of biotechnology; position of enclosures in areas with erratic sea conditions and consequent stress and injury to fish; inability of salmon to exhibit normal behaviours such as swimming great distances; the impact on salmon of lighting manipulation used to increase growth rate, alter spawning time and reduce the time for smolyting; invasive removal of fish eggs and sperm; aggression and cannibalism between fish as a result of their growing at different rates; risk of predators; fish being crowded for grading; counting and catching for slaughter leading to stress and injuries; stress and injury caused by catching and transport; and poor water quality and accidents during transport.

A range of standards are also included in the RNSZPCA draft blue tick standards to address these concerns, along with evidence to be provided proving that the standards have been fulfilled (in the form

1414 Best Aquaculture Practices "Aquaculture Facility Certification: Salmon Farms Best Aquaculture Practices Certification Standards, Guidelines" (Issue 2, 3 October 2016) at 17
1415 ASC "Salmon" <https://www.asc-aqua.org/what-we-do/our-standards/farm-standards/the-salmon-standard/>
1416 Interview with Mark Preece, above n 68
1417 Interview with Mark Preece
1418 Email from Mark Preece to the author, 7 December 2020
1419 Interview with Mark Preece
1420 Interview with Mark Preece
1421 RNZSPCA, SPCA Blue Tick Standards – Farmed Salmon, undated.

of documentation of methods used or events observed).[1422] Unfortunately this draft guidance has yet to be adopted by the salmon industry. Although that remains a possibility, an alternative would be to use the document as the springboard for a code of welfare for farmed fish. Indeed, that course would be preferable to such a code being used informally within the industry, and to industry simply relying on quality assurance schemes, as the Act requires public consultation and a consideration of the latest scientific knowledge and good practice to take place when a code of welfare is developed. It is to be expected that, informed by such evidence, a code of welfare would bring together the best features of not only the RNZSPCA document, the Best Aquaculture Practices and the Aquaculture Stewardship standards, but also the recommendations contained in the OIE Aquatic Animal Health Code developed by the World Trade Organisation (of which New Zealand is a member).[1423]

A model for overall welfare assessment of caged Atlantic salmon has been developed that could assist. This model recommends the following as welfare indicators: temperature (10–15°C); salinity; oxygen saturation (at levels above 80%); water current; stocking density (below 22 kgm^3); lighting; disturbances; daily mortality rate; appetite; infestations of sea lice; condition factor; emaciation state; vertebral deformation; sexuality maturity stage; smoltification state;[1424] and fin condition and skin condition.[1425]

However, it is also important to note that what is required for fish welfare will vary depending on the species of fish.[1426] As Atlas notes:[1427]

> It is essential that those responsible for ensuring and evaluating the welfare of farmed fish first understand species-specific behavior and biology before drawing conclusions about welfare.

Additionally, individual fish within a group will differ in their response to external stimuli, and this needs to be taken into account in managing the welfare of farmed fish. As Martins et al noted:[1428]

> …while one individual may interpret a situation as…highly stressful, another may interpret it as mildly stressful or…not at all stressful…not all individuals within a group will have a good welfare status. In fact, group-based indicators may hide poor welfare at an individual level.

1422 Recommendations include daily inspections; the use of management plans (e.g. regarding net cleaning and repair, disease management, mortality management to bring mortality to below 12% and risk management as regards the use of lighting manipulation); monitoring of water quality; feeding practices that minimise competition and aggression; feeding to be observed and corrective action taken if aggression seen; feed withdrawal used only when necessary and for no longer than 3 days; antibiotics to be prescribed by a veterinarian and products registered for use in New Zealand; monitoring of mortality rates; no use of bio-techniques to produce triploidy; no use of pens in adverse sea conditions; equipment and enclosures that cause injury to fish to be rectified; fish only to be removed from water where absolutely necessary and to receive anaesthetic where removed for more than 20 seconds; fish to be crowded together for no more than 3 hours; breeder fish to be anaesthetized prior to stripping or milking of eggs and compressed air not to be used to assist in this process; grading of fish pens such that fish kept together are of a similar size so as to minimise aggression and stress; all staff to undergo training and to be assessed for their technical ability; injured and ill fish not to be transported but humanely euthanized; anaesthetic to be used when fish stunned or killed (specifically, Aqui S); stocking densities to be below 15kg per cubic metre and emergency killing to be conducted by trained individuals and method used to result in immediate and irreversible loss of eye-roll reflex and loss of respiration.

1423 The OIE Aquatic Animal Health Code outlines "the basic requirements for the welfare of farmed fish include handling methods appropriate to the biological characteristics of the fish and a suitable environment to fulfil their needs" (OIE Aquatic Animal Health Code, Article 7.1.2(1)). It further provides for a range of recommendations in relation to the transport and slaughter of farmed fish. For example, the establishment of "minimum standards for fish welfare during transport, including examination before, during and after their transport" (OIE Aquatic Animal Health Code, Article 7.2.2(1)(a))

1424 "Smoltification is the process of physiological, morphological, and behavioural changes that undergo young salmonids for facilitating transition from fresh to salt water during their migration." Nelson R. Cabej "Neural Manipulation of Gene Expression" in *Epigenetic Principles of Evolution* (2nd edn, Academic Press, UK, 2019) 41.

1425 Stien et al, above n 1315

1426 Aquatic Animal Working Group A *Review of Current Welfare Arrangements for Finfish in Australia* (Panaquatic Health Solutions, Australia, 2006) at 5 ("Fish…occupy a diverse range of habitat and ecological niches" – as such, fish welfare is necessarily species-specific.

1427 Atlas, above n 1349, at 35

1428 Catarina LM. Martins et al. "*Behavioural Indicators of Welfare in Farmed Fish*" (2012) 38 Fish Physiology and Biochemistry 17 at 33 – 34.

In 2014 the Farm Animal Welfare Committee (an expert committee of the Department for Environment, Food and Rural Affairs in England, Scotland and Wales) stated that most monitoring of farmed fish animal welfare is at the group level but that individual monitoring is also important "both for ethical and commercial reasons."[1429] For example, this "may require provision of appropriate conditions for categories that need them, such as small or sick fish – either provided for them, or available for self-selection."[1430] The Committee noted that "new and perhaps radical approaches to design and management"[1431] may be necessary to account for the management of individual fish welfare.

8.5 INHUMANE METHODS OF SLAUGHTER

The only code that currently applies specifically to fish is the Code of Welfare (Commercial Slaughter) 2018, which, as its name suggests, applies only to slaughter and not to such things as transportation, feeding or water quality. This code applies to farmed finfish; wild-captured finfish held for killing at a later time; eels; and crustaceans (including crabs, lobsters, crayfish, shrimp, krill).[1432] It does not apply to wild-captured finfish that are slaughtered on-board fishing vessels.

8.5.1 FARMED FINFISH AND WILD-CAUGHT FISH HELD FOR KILLING AT A LATER TIME

The Code of Welfare (Commercial Slaughter) 2018 contains minimum standards for approved slaughter techniques. Regarding farmed finfish and wild-captured finfish held for killing at a later time, the standards regulate methods of slaughter including brain spiking (inserting a needle or metal rod to destroy the brain); electrical stunning combined with severing the blood vessels in the gill arches or puncturing the heart; and emersion (removal of fish from water).[1433] The latter method requires fish to be chilled to less than 4°C before they are taken out of the water.

The code requires that killing methods must "result in rapid and irreversible loss of consciousness",[1434] however it does not require farmed finfish and wild-caught fish held for killing at a later time to be rendered insensible prior to being killed. This is a significant omission, as both pithing and emersion are associated with low welfare outcomes where the fish is not rendered insensible prior to being killed – even where fish are kept at low temperatures when the emersion method is used.[1435] In contrast, it is a requirement of the code that wild-caught crabs, rock lobsters and freshwater crayfish be chilled to below 4°C when killed, or electrically stunned, or otherwise rendered insensible before being killed.[1436] In addition, eels must be rendered insensible for the duration of the desliming process or killed before they are deslimed.[1437]

1429 Farm Animal Welfare Committee (FAWC) *Opinion on the Welfare of Farmed Fish* (Department for Environment, Food and Rural Affairs in English, the Scottish and the Welsh Governments, United Kingdom, 2014) at [113].

1430 At [125]

1431 At [101]. "As just one example, it might be possible to design pens so that fish have to pass through a shallow channel (say, to reach a feeder), enabling them to be observed, and isolated if necessary. Alternatively it might be possible to carry out more checks on individuals during grading."

1432 Code of Welfare (Commercial Slaughter) 2018 at 27

1433 Minimum Standard No. 21(e), 21(g), 21(h), at 27

1434 Minimum Standard No. 21(d), at 27

1435 Lines and Spence, above n 1394, at 255 and 260 for a discussion of the welfare outcomes associated with pithing and asphyxiation in air.

1436 Code of Welfare (Commercial Slaughter) 2018, Minimum Standard No. 22(e) at 28. The requirement for insensibility as regards crabs, rock lobster, crayfish and kōura is also provided for in regulation 11 of the Animal Welfare (Care and Procedures) Regulations 2018.

1437 Minimum Standard No 21(i), at 27. This requirement is a new one and accounts for the fact that the desliming of eels using salt or chemicals requires the eel to be alive during desliming and exposes them to a long period of stress (an hour or more) before death.

Mark Preece of the New Zealand Salmon Farmers Association advised that most salmon farms in New Zealand use percussive stunning in order to render the fish insensible prior to being killed. This method induces immediate insensibility through a severe blow to the skull of an animal. However, he stated that some of the smaller farms might simply utilise a percussive blow to the head.[1438] Preece noted there are sound reasons for the use of percussive stunning for both animal welfare and for product quality,[1439] with the killing process needing to be "as stress-free as possible."[1440]

8.5.2 WILD FISH CAUGHT FOR IMMINENT DESTRUCTION

Crucially, the code also does not apply to recreational and commercial fishing where fish are caught for imminent destruction, that is to say it does not "extend to the practices on board fishing vessels".[1441] Consequently, in spite of evidence of prolonged suffering from current slaughter methods, there is no requirement that wild-caught fish must be rendered insensible before being killed. As Mark Preece of New Zealand Salmon Farmers Association stated:[1442]

> You think of how New Zealand use fish…we're quite happy to go out in the weekend, cast a rod into the ocean with some light gear, hook a fish through its mouth, play with that fish as long as we can while it tires itself to exhaustion and reel it in and throw it in the chilly bin. In my opinion that's entirely unacceptable…I'm happy to catch a fish but the fish gets pulled in [and] gets killed so it's as quick as possible.

In relation to wild fishing Preece considers the industry needs "to have a slaughter process or a harvest process as well – where they pump and stun fish… that's relatively easy to put in place."[1443] An amendment to the Act is required to address this issue. This is because the offence of ill-treating an animal under s 29(a) does not apply to fish caught in the wild.[1444] While it is an offence to wilfully or recklessly ill-treat a wild animal under s 30A of the Act, it is a defence if the conduct is part of a generally accepted practice in New Zealand for the hunting or killing of wild animals.[1445] Fishing is generally an accepted practice in New Zealand, meaning that those who engage in the practice have a defence to a charge of wilful or reckless ill treatment of a wild animal under s 30A.

Further, s 30D(2) provides that while the Act's general provisions apply to the killing of animals in captivity for the purpose of facilitating their imminent destruction, this does not apply to "an animal caught by fishing." Thus, large fishing operations that catch and destroy fish are not bound by the Act's welfare provisions, such as s12(c), which safeguards animals from being killed in ways that cause them to suffer unreasonable or unnecessary pain or distress.[1446] Yet, as the animal advocacy organisation 'Eurogroup for Animals' has described, when fish are caught by trawling nets they are pursued to exhaustion; crushed

1438 Interview with Mark Preece, above n 68

1439 "Both percussive and electrical stunning and killing systems, if applied correctly, can induce immediate and irreversible insensibility, thereby subjecting the animals to less pain, stress and undue suffering as compared with other methods." Stephanie Yue "An HSUS Report: The Welfare of Farmed Fish at Slaughter" (The Humane Society of the United States, 2011) at 1.

1440 Interview with Mark Preece, above n 68

1441 Black, above n 1372, at 258

1442 Interview with Mark Preece, above n 68

1443 Interview with Mark Preece

1444 Animal Welfare Act 1999, s 30B provides that "Nothing in this Act makes it unlawful to hunt or kill a) any animal in a wild state….e) any fish caught from a constructed pond."

1445 Section 30A(3)

1446 There is no available case law on the meaning of s 30D and whether fish caught as part of a commercial fishing operation (e.g. in a net) are 'in captivity' for the purposes of s 30D. Thus, our interpretation is based on a plain reading of the Act and this section.

under the weight of other fish; and often spiked with hooks while dragged out of the water.[1447] Similarly, fish are often gutted while still alive (an act that is not allowed under the codes of welfare for other farmed animals); slaughtered by asphyxiation (being deprived of oxygen); slaughtered by barotrauma (where the air bladder of the fish ruptures through rapid depressurization); and killed by crushing and chilling in ice slurry.[1448]

These methods "cause considerable distress"[1449] in fish. The most humane method of slaughter being pithing is used only rarely for more valuable catch such as tuna.[1450] One study has found that it takes common species of fish 55 – 250 minutes to die through asphyxiation and 25 – 65 minutes to die by live gutting.[1451] Perhaps unsurprisingly then, the OIE Aquatic Animal Health Code has recognised that killing fish through chilling with ice in holding water and/or with carbon dioxide in holding water; through salt or ammonia baths; through asphyxiation by removal from water; and through exsanguination without stunning "have been shown to result in poor fish welfare."[1452]

Clearly then, if fish are sentient and are caught in these ways by trawlers and recreational fishers alike, their welfare needs are not being met. There is no reason why this loophole for fish caught in the wild should exist, especially given that many companies overseas have boats outfitted with electrical stunning devices to humanely slaughter fish in such circumstances.[1453] As SAFE has stated, the provisions of the Act should:[1454]

> …hold to a standard of humane treatment rather than 'generally accepted practice', which can still include very cruel practices that would otherwise contravene the Act if applied to other animals.

Preece noted that the Code of Welfare (Commercial Slaughter) 2018 as it relates to fish is "quite basic" and "it's a pretty low bar to set… it's been pretty standard in fish farming [for the last 20 years]."[1455] Again, there is no requirement that finfish or wild fish be stunned before being killed, which is a requirement for most other farmed animals in New Zealand,[1456] and a recommendation of the OIE Aquatic Health Code.[1457]

Furthermore, when compared to the OIE Aquatic Animal Health Code, the Code of Welfare (Commercial Slaughter) 2018 does not require that stunning and killing methods take account of species-specific information where available; that handling, stunning and equipment be tested on a regular basis to ensure that performance is adequate; that effective stunning be verified by the absence of consciousness; that a backup stunning system be required and that where stunning fails or a fish regains consciousness it should be re-stunned as soon as possible; or that stunning should not take place if killing is likely to

1447 Eurogroup for Animals "Looking Beneath the Surface: Fish Welfare in European Aquaculture" (July 2018) <https://www.eurogroupforanimals.org/media-2-3>.

1448 Eurogroup for Animals, above n 1448

1449 Humane Slaughter Association, above n 1343, at 1

1450 Black, above n 1327, at 255, citing Diggles, BK, Cooke, SJ, Rose, JD and Sawynok, W "Ecology and Welfare of Aquatic Animals in Wild Capture Fisheries" (2011) 21 Reviews in Fish Biology and Fisheries 739.

1451 Fishcount.org.uk "Humane slaughter" <http://fishcount.org.uk/fish-welfare-in-commercial-fishing/humane-slaughter>

1452 OIE Aquatic Animal Health Code, Article 7.3.6.

1453 Seattle based Blue North Fisheries being one such example. Hal Bernton "Blue North Fisheries CEO works towards a 'humane harvest'" *SeattleTimes* (online ed, Seattle, 16 March 2015).

1454 SAFE "Submission to the Primary Production Committee in the Matter of the Animal Welfare Amendment Bill" at [6]

1455 Interview with Mark Preece, above n 68

1456 See Code of Welfare (Commercial Slaughter), Minimum Standard No 6; Minimum Standard No 12; Minimum Standard No 15; Minimum Standard No 2.

1457 World Organisation for Animal Health (2012) *Aquatic Animal Health Code,* Ch 7.3 welfare aspects of stunning and killing of farmed fish for human consumption. Developed by World Organisation for Animal Health (the OIE), the code was created to provide standards for the betterment of aquatic animal and farmed fish health worldwide in respect of transport and slaughter. It does not contain any standards regarding the actual farming of fish.

be delayed such that the fish will recover or partially recover consciousness.[1458] As Lines and Spence have noted, even percussive and electrical stunning "can have a poor welfare outcome if insufficient consideration is given to the needs of the fish or if the equipment has not been properly designed."[1459]

Additionally, the Code of Welfare (Commercial Slaughter) 2018 recommends the use of anaesthetic agents, although it is not a requirement under the minimum standards, but is referred to in general information.[1460] SAFE has contended that many farming operations do not use anaesthetics when slaughtering farmed salmon.[1461] This was confirmed by Mark Preece of New Zealand Salmon Farmers Association, who informed us "there's no one in New Zealand that does that now."[1462] This is due to the fact that fish "move straight to the stunner and then are hit on the head and are brain dead at that point."[1463] However, commentators have noted that the "use of food-grade anaesthetics to assist with the harvest has significant potential for improving welfare..."[1464] This is due to the fact that "fish can lose consciousness with little disturbance [meaning] that a high standard of welfare may be possible."[1465] As such, the use of such anaesthetic agents should be further investigated.

The Code of Welfare (Commercial Slaughter 2018) must be amended to incorporate such provisions. At a minimum it must be amended to require that farmed finfish, wild-caught fish kept for killing at a later time and wild-caught fish caught for imminent destruction be rendered insensible prior to being killed (e.g. through percussive or electrical stunning).

1458 OIE Aquatic Animal Health Code, Article 7.3.6.
1459 Lines and Spence, above n 1394, at 255
1460 Code of Welfare (Commercial Slaughter) 2018 at 27 and 29
1461 SAFE "Fish Farming in New Zealand" <https://safe.org.nz/our-work/animals-in-need/fish/fish-farming-in-new-zealand/>
1462 Interview with Mark Preece, above n 68
1463 Interview with Mark Preece
1464 Lines and Spence, above n 1394, at 255
1465 At 260

“GIVEN THE DISPARITY BETWEEN THE ACT AND THE CODES AND REGULATIONS... WE RECOMMEND THAT ALL THE CODES AND REGULATIONS RELATING TO FARMED ANIMALS BE REVIEWED...”

EXTRACT FROM PAGE 234

CHAPTER 9 - RECOMMENDATIONS FOR REFORM

9.1 INTRODUCTION

Our analysis has revealed a significant discrepancy between what is required by the Animal Welfare Act 1999 and what is provided for in the codes of welfare and regulations for farmed animals. In particular, there are many respects in which the physical, health and behavioural needs of dairy cattle, pigs, layer hens and meat chickens are not being met, despite this being required by the Act.[1466]

For instance, space is a significant issue for all the animals we considered. Examples of this include:

- The use of off-paddock facilities for dairy cattle, which do not require these animals to have access to the outdoors and which are closely confined relative to how cows have been raised in our traditional pastoral farming system;
- The use of closely confined farrowing crates where sows cannot even turn around and where they can be confined for up to four – five weeks at a time;
- In the minimum allowable space provided to pigs that are raised for meat, which is not sufficient to meet their behavioural needs;
- In the continued use of colony cages for layer hens, where 60 hens may be kept in a single cage, with 750 cm^2 of space per hen; and
- In the high stocking densities permitted for meat chickens of 15 hens per m^2.

This lack of space inhibits the expression of these animals' normal behaviours, which are not guaranteed under the respective codes of welfare, or the regulations. While the codes provide that these animals must be able to express a number of behaviours, these are very limited and do not include all the behaviours that these animals feel a strong urge to perform, including behaviours such as exploration, play, walking, socialising and more. None of these animals are required to have access to the outdoors, despite the fact that this would greatly assist in facilitating the expression of such behaviours. And where access to the outdoors is provided, there is insufficient provision for shelter to ensure that these animals actually use the outdoor range and are protected from environmental extremes – the issue of winter grazing in dairy cattle is one such example, with MPI having recently recognised the significant implications of keeping dairy cattle in rainy, muddy conditions on their health and welfare.

Selective breeding for high productivity is another significant welfare issue. For instance, selecting meat chickens for high growth rates has led to an increased incidence of lameness and mortality, heart problems, ascites, sudden death syndrome, leg disorders, metabolic disease and skeletal disorders. Similarly, selective breeding has led to an increased incidence of feather pecking and aggressive behaviour in layer hens; to an increased incidence of osteoporosis; and to a high incidence of keel bone fractures.

1466 Animal Welfare Act 1999, ss 10 and 73(1)

These are just a few examples of how the codes of welfare and regulations undermine the standard prescribed by the Act, among many more. This discrepancy is attributable to systemic flaws associated with the processes by which the codes are established by NAWAC. We have found there to be inadequacies regarding the manner in which the relevant scientific literature has been reviewed, with NAWAC having failed to consider relevant scientific studies in numerous instances.

Finally, it is highly concerning that there is no code of welfare whatsoever for farmed fish. It is not well recognised that fish are sentient and have the capacity to suffer in a manner similar to any other animal. In addition, fish farming is a significant industry in New Zealand and the welfare of many animals is at stake. Unfortunately there is currently little guidance provided regarding the way in which these animals should be farmed. In addition, there is no requirement under the Act or codes of welfare that farmed finfish and fish caught in the wild must be rendered insensible prior to being slaughtered – this is a significant welfare issue, with such fish currently able to be slaughtered in ways that are clearly inhumane. These omissions are in need of urgent redress.

9.2 CODES OF WELFARE AND REGULATIONS

9.2.1 A COMPREHENSIVE REVIEW OF THE CODES OF WELFARE AND REGULATIONS IS NEEDED

Given the disparity between the Act and the codes and regulations outlined above, we recommend that all the codes and regulations relating to farmed animals be reviewed by NAWAC to establish that the standards they provide do ensure the 'physical, health and behavioural needs' of farmed animals are met, in accordance with the latest scientific knowledge and good practice.

We understand that NAWAC intends to conduct a review of the codes, as outlined in its *Timeline for Reviewing Codes of Welfare*.[1467] However, it is unclear exactly what this review will consist of. In light of this, we further recommend that NAWAC's review of each of the codes of welfare needs to be comprehensive, addressing at a minimum the welfare issues outlined in this report, in accordance with the latest scientific knowledge and good practice. Such a review should also require NAWAC to undertake a robust public submission process (as required by s 71 of the Act), including notifying the public that the code is being reviewed; giving further notice to persons likely to have interest in the review (such as animal welfare organisations); and allowing 30 working days after the date on which the notice is first published in a daily newspaper for the receipt of submissions on the review. As required by s 74(2) of the Act, a report ought to be produced for each review setting out the reasons for NAWAC's recommendations; the nature of any significant differences of opinion about the code highlighted by submissions or that have occurred within the committee; and matters that NAWAC considers should be dealt with by regulations.

Additionally, in conducting such a review it is essential that NAWAC align the codes of welfare and regulations with the standards prescribed in the Act. This has already taken place as between the codes of welfare and regulations resulting from the Amendment Act (No 2) 2015, with MPI having amended the codes of welfare to align minimum standards with these regulations through the issuing of the 2018 codes of welfare. A similar process should take place in relation to the Act itself. Where it is not immediately possible to align a code of welfare and regulations with the standards prescribed by the Act, inconsistent practices should be addressed by regulations under ss 183A(2) – (6). These sections provide that such practices are subject to phasing-out timeframes of 10 - 15 years. In this respect, MPI's failure to transpose inconsistent practices into regulations under ss 183A(2) – (6) is not merely a technicality, but is of great significance because it has allowed these practices to continue indefinitely, contrary to the plain provisions of the Act. Ultimately, all inconsistent practices should be phased-out and should not be allowed to continue with no end in sight.

1467 National Animal Welfare Advisory Committee, above n 324

9.2.3 DEVELOPMENT OF A CODE OF WELFARE FOR FARMED FISH AND AMENDMENTS TO THE CODE OF WELFARE (SLAUGHTER) 2018

We recommend that a code of welfare for farmed fish be developed to provide guidance to the fishing industry. The Code of Welfare (Slaughter) 2018 should also be revised to require both wild and farmed finish to be rendered insensible prior to slaughter.

9.2.4 RECOMMENDATIONS FOR IMPLEMENTATION AT THE FARM GATE

NAWAC must ensure in its review of the codes and regulations that the minimum standards contained in the codes are clearly understandable as well as accessible to stakeholders. A concern was expressed on the part of some industry representatives that there is a lack of clarity in the codes, which could make them difficult for farmers to follow. For example, Jenny Jago of DairyNZ considered that the wording of the codes could be "pretty challenging", commenting that it was difficult to determine, for example, what 'adequate' means when these vague metrics form the basis of the minimum standards.[1468] Julie Geange of Federated Farmers similarly noted the need for the standards to be unambiguous. She stated: "whether or not they're understandable is the big thing."[1469]

Aside from reviewing the standards specific to each animal, we also recommend that it be mandatory for copies of the relevant codes of welfare and regulations to be prominently displayed and available at farms at all times, and that they be regularly reviewed by staff. Alternatively, each relevant minimum standard should require, as part of the standard, that all staff working with animals or responsible for their care be familiar with the applicable standard. Minimum standard 1 (Stockmanship) of the Code of Welfare (Meat Chickens) 2018 and the Code of welfare (Pigs) 2018 each contain an example indicator that those caring for and handling these animals should be familiar with the minimum standards and that a copy of the minimum standards should be available on site at all times. It is unclear why this has not been included as an example indicator in the equivalent minimum standards for dairy cattle and layer hens. Furthermore, it is unclear why this is expressed as an example indicator rather than as a minimum standard. There should be a requirement for the minimum standards and regulations to be available and to be reviewed by staff and farmers regularly. Such requirements would appear elementary and thus must be remedied by NAWAC.

Each of the codes of welfare should also include either as a minimum standard or a recommended best practice a requirement for farmers to obtain relevant qualifications in regards to stockmanship. This is advisable, given the importance of good stockmanship in ensuring that the physical, health and behavioural needs of animals are met.

1468 Interview with Jenny Jago, above n 3
1469 Interview with Julie Geange, above n 20

9.2.5 REGULAR REVIEW OF THE CODES OF WELFARE

In addition to the current standards being set on the basis of an incomplete review of the science, they have not updated for a number of years despite scientific developments. Although NAWAC has conducted a limited review of a number of the codes (such as off-paddock facilities and bobby calves for dairy cattle, and to extend the phase out of battery-cages for layer hens), not one of the current codes has been comprehensively reviewed.

In 2020 NAWAC established a code review process, wherein it will review most of the codes of welfare, taking into account assurance programmes; killing / emergency killing; positive welfare and sentience; emergency management and preparation; and selective breeding.[1470] The timeframes outlined in NAWAC's code review process provide for the current codes of welfare for dairy cattle, pigs, meat chickens, layer hens and pigs to be reviewed approximately 9 – 15 years after they were first drafted.[1471] A similar timeframe has been set in relation to deer and sheep and beef cattle[1472] and an extended timeframe of 9 – 17 years has been established in regards to llamas and alpacas, goats, horses and donkeys.[1473]

While NAWAC *Guideline 01: Approach to consideration of draft codes of welfare* provides that "The relevance of all codes should be reviewed after 10 years",[1474] this is not currently a legislative requirement, and in any event would not seem adequate given rapidly evolving animal welfare science and public expectations as to animal welfare. We recommend that NAWAC be required to review the codes every five years to ensure that the standards are up-to-date in relation to the latest scientific literature and good practice.

1470 National Animal Welfare Advisory Committee, above n 542, at 1

1471 The deadlines for reviewing the above codes of welfare are all outlined in NAWAC's work programme National Animal Welfare Advisory Committee, above n 542 at 1

1472 At 1

1473 At 1

1474 National Animal Welfare Advisory Committee, above n 941, at 1

9.3 AMENDMENTS TO THE ANIMAL WELFARE ACT 1999

Ensuring that delegated legislation is consistent with its governing legislation is important not only for animal welfare and for New Zealand's international reputation but also as a function of the rule of law.[1475] At present, there are a number of provisions in the Act that are at risk of failing to meet this standard.

For example, s 183A allows the Governor-General to make regulations that are inconsistent with the Act. This means regulations can be established which fail to achieve or even undermine the obligations in s 10 to meet the physical, health and behavioural needs of animals; the obligations in s 11 to alleviate the pain or distress of ill or injured animals; and the obligations that a person would otherwise need to observe in the treatment, transport or killing of animals under ss 12(c), 21(b), 22(2), 23(1) or 29(a). MPI has recognised that regulations have the potential to be more impactful than the codes of welfare, stating "MPI considers that non-regulatory options alone, such as amending the codes of welfare and education, will not provide a significant improvement over the status quo."[1476] Similarly, in a 2017 Regulatory Impact Statement it advised:[1477]

> Updating codes of welfare may improve the behaviour of some of those who inadvertently mistreat animals through lack of knowledge. However, as codes of welfare are difficult to enforce, amending the codes is unlikely to impact on the behaviour of all those who mistreat animals – and in particular will not reach those who are simply not motivated to do better."[1478]

Regulations then, are a key mechanism for the improvement of farmed animal welfare standards. Thus, it may be necessary to narrow the scope of s 183A so as to better align it with the provisions of the Act, in order to ensure that the problems we've identified with the codes do not continue to persist through the regulations route.

At present the section permits the making of regulations inconsistent with the Act where any adverse effects of a change from current to new practices have been considered and there are no feasible or practical alternatives currently available and/or where not to do so would result in an unreasonable impact on a particular industry, the public, or New Zealand's wider economy. Section 183A does not

1475 As noted on the New Zealand Parliament website: "As delegated legislation owes its existence to a statutory power, if its provisions exceed that power (that is, the delegated legislation is ultra vires) it is invalid, and of no lawful effect." New Zealand Parliament, above n 170

1476 Ministry for Primary Industries, above n 13, at 3

1477 At 10

1478 At 10

appear to require the industry affected to be a major industry, nor for the impact to be on a large sector of the public. Hence the scope for exception may be exceedingly wide.

Section 73(3) of the Act allows NAWAC to take into consideration practicality and economic impact in establishing codes, if relevant. We recommend adding the additional requirement of considering the possibilities for environmental and behavioural enrichment for animals in whatever circumstances they may be housed. Such a provision would help to ensure that NAWAC does put its collective mind to the behavioural requirements of farmed animals, this being the aspect of animal welfare most neglected in the codes of welfare and regulations.

Finally, the loophole contained in s 30D of the Act should be repealed in relation to industrial scale wild fishing. This provision currently provides that those who hold in captivity an animal that has been captured for the purpose of facilitating its imminent destruction must comply with the general provisions of the Act. However, there is an exclusion for animals caught by fishing. This effectively excludes fish caught in the wild from the protections afforded by s 12(c), which safeguards animals from being killed in ways that cause them to suffer unreasonable or unnecessary pain or distress – meaning that wild fish can be killed without having to be stunned or otherwise rendered insensible. It is long established in animal welfare science that this is extremely inhumane and especially problematic given the scale of industrial wild fishing in New Zealand.

9.4 IMPROVEMENTS TO THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE'S PROCESSES

Our analysis of the codes of welfare has revealed that there are fundamental concerns relating to the process by which the codes of welfare and regulations are established by NAWAC.

In particular, we see repeated evidence of NAWAC deferring unduly to industry interests, with NAWAC ignoring relevant scientific literature and the requirement under the Act to meet the 'physical, health and behavioural' needs of animals in favour of industry standards. This appears to be due to NAWAC's positioning within MPI. Given that MPI's core role is to foster our agricultural economy, there appears to be a conflict of interest inherent in NAWAC developing animal welfare law and policy. The ultimate effect of this is to compromise the efficacy of code formulation.

For example:

- NAWAC acknowledged scientific research in its reports to the meat chicken and layer hen codes of welfare showing that birds find environments with ammonia at levels above 10ppm aversive. Despite this, NAWAC set the minimum standard twice as high as this at 20ppm.
- NAWAC explicitly recognised scientific literature recommending at least seven hours of continuous darkness to facilitate meat chicken welfare, but then provided for a minimum of only four hours – ostensibly on the basis that this was current industry practice at the time.[1479]
- NAWAC identified a lack of scientific information in relation to lighting requirements for layer hens and meat chickens and justified setting the parameters at 20 – 50 lux as this was in keeping with international practice and commercial standards. However, there were a number of studies available investigating this issue that NAWAC did not consider. NAWAC did consider one study that found chickens reared with a high illumination (e.g. 200 lux) had fewer, longer and less interrupted bouts of resting and consequent improved welfare. However, it dismissed the relevance of the research noting its application had not been investigated within the context of lighting levels commonly used in commercial production.[1480]
- It appears in some instances NAWAC has justified adopting standards that either appear inadequate based on the science, or that do not appear to have a scientific foundation, when the EU or UK has also adopted lower standards. This includes in relation to setting stocking densities for layer hens in barns; stocking densities for meat chickens; and continuous lighting for meat chickens. And yet, it appears to reject EU standards where they are higher e.g. in relation to stocking densities for layer hens in barn systems, which NAWAC has set at 4,000 birds per ha^2, compared to 2,000 birds per ha^2 in the EU.
- NAWAC decided to advise the Minister in 2016 that farrowing crates and sow stalls do meet the requirements of the Act, despite having stated for *11 years* that they do not. NAWAC then opted to turn these provisions into regulations under s 183A of the Act, thereby allowing them to continue indefinitely. As the High Court recently recognised, these provisions do *not* meet the obligations of the Act and should have been turned into regulations under s 183A(2) and phased out within the relevant timeframe of 10-15 years.[1481]

1479 National Animal Welfare Advisory Committee, above n 886, at 4
1480 Alvino et al, above n 1047, at 275
1481 *The New Zealand Animal Law Association v The Attorney General*, above n 4

We hope that this research will encourage reform of the processes by which future codes of welfare and regulations are established by NAWAC in relation to the consultation they undertake; their approach to reviewing relevant scientific literature; and their processes for ensuring that standards contained in codes of welfare and regulations conform to the requirements of the Act. This could include greater consideration of public submissions to the codes of welfare and regulations; greater collaboration between MPI/NAWAC, animal welfare organisations and academia; and a more robust methodology being utilised by NAWAC when reviewing scientific literature and data. Our specific proposals for reform to NAWAC's processes are outlined below.

9.4.1 INDEPENDENT OVERSIGHT OF THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE'S

Given the conflict of interest inherent in NAWAC administering animal welfare law and policy while it sits within the auspices of MPI, it is extremely important that there be independent oversight of NAWAC's animal welfare functions, including assessing the extent to which they are discharging the statutory functions entrusted to them. Such oversight is fundamental to the rule of law and to effective democracy. At present there is no such check and balance.

Although the codes of welfare and regulations are delegated legislation and therefore subject to disallowance motions and subject to oversight by Parliament's Regulations Review Committee, there have only ever been three challenges to a code of welfare through this Committee.[1482] Otherwise, no one is scrutinising NAWAC's decisions or the science reviewed by NAWAC to check that it is accurate and up-to-date. An Associate Minister for Agriculture was appointed as part of the current Labour Government and assigned the animal welfare portfolio. However, this individual was stripped of her portfolios in 2018 and no one was chosen to replace her in this capacity until recently.[1483]

Thus, we recommend the implementation of independent assessments of NAWAC's performance by another government agency or independent party, or that other checks and balances be implemented. For instance, an Inspector-General or Ombudsman for Animal Welfare could be established with the task of monitoring and auditing the performance of MPI and NAWAC in relation to animal welfare.

1482 These were in relation to the Code of Welfare (Layer Hens) 2005 at the behest of the Animal Rights Legal Advocacy Network in 2006; the Code of Welfare (Layer Hens) 2012 at the behest of SAFE in 2015; and in relation to the application of the Act by NAWAC and MPI in 2019 at the behest of World Animal Protection.

1483 Meka Whaitiri was the Associate Minister for Agriculture and had the portfolio of animal welfare. Laura Walters "Animal Welfare Minister Never Replaced" (5th November 2019) Newsroom < https://www.newsroom.co.nz/2019/11/04/894628/animal-welfare-minister-never-replaced>; "SAFE Pleased to See Role of Minister Responsible for Animal Welfare Returned" (2 November 2020) Scoop < https://www.scoop.co.nz/stories/PO2011/S00018/safe-pleased-to-see-the-role-of-minister-responsible-for-animal-welfare-returned.htm>

9.4.2 ESTABLISHMENT OF AN INDEPENDENT COMMITTEE FOR ANIMAL WELFARE OR INDEPENDENT COMMISSIONER FOR ANIMAL WELFARE

Alternatively, the responsibility for the development of animal welfare standards could be transferred to an existing agency that does not have conflicting priorities, or to an entirely new Governmental entity established for this purpose such as an independent ministry,[1484] or an Independent Commissioner for Animal Welfare who reports to Parliament and not the executive Government[1485] (just as the Commissioner for the Environment, the Commissioner for Children and the Families Commission do). Such an approach was recommended by Rodriguez Ferrere *et al*. in their 2019 report *Animal Welfare: Oversight, Compliance and Enforcement*;[1486] by the Green Party's animal welfare policy;[1487] and by World Animal Protection.[1488] International examples of this include the 2012 decision of the Israeli Government to transfer animal welfare responsibilities from its MPI equivalent to its Environmental Protection Agency, and the European Union transferring the responsibility for animal welfare from The Directorate-General for Agriculture to the Directorate-General for Health and Consumers in 2012 (with scientific advice on welfare matters provided by an independent panel on Animal Health and Welfare).

Another option would be the establishment of an independent committee of full-time staff working on the codes and doing the work of NAWAC. This would ensure independence in the formation of animal welfare codes and regulations, and that animal welfare receives dedicated attention and resource.

The lack of such independent representation has led World Animal Protection to state that animal welfare "is accordingly not presented at a high level of government"[1489] in New Zealand. Separating out these responsibilities would assist in improving public confidence in the administration of animal welfare law; would lead to the production of more robust animal welfare standards; and would enable MPI to focus on its role of promoting productive and profitable primary industries, "unencumbered by growing public demands for greater attention to be given to a conflicting objective."[1490]

In fact, the appointment of an Independent Commissioner or independent committee could help to ameliorate some of the issues MPI itself has identified with its role. A study commissioned by MPI in 2019 has recognised that there is a demand "to demarcate MPI's various roles"[1491] and that "setting and enforcing standards, and advocating for higher standards, was confusing, as was the interaction between market and private approaches to animal welfare."[1492] Potential advantages to such a system were identified 30 years ago in a Discussion Paper to the then Ministry for Agriculture and Fisheries. These advantages included:[1493]

1484 As previously called for by the Green Party of Aotearoa "Animal Welfare Policy" <http://www.greens.org.nz/searchdocs/policy5349.html> (July 17, 2002)

1485 As recommended in Ferrere, King and Larsen, above n 123; Animal welfare advocate Catriona MacLennan and Farm Watch, quoted in Tao Lin "Call for animal welfare watchdog after 'sickening' comments on dairy farming Facebook page" Stuff (online ed, New Zealand, 7 November 2016). and Simon Wong "SAFE Slams 'Meaningless' Animal Welfare Reform" *Newshub* (online ed, New Zealand, 15 April 2016). ("[SAFE] says an independent authority for animals is needed.").

1486 Ferrere, King and Larsen, above n 123

1487 Green Party of Aotearoa, above n 1484

1488 World Animal Protection, above n 234, at 2

1489 Animal Protectiong Index, above n 500. World Animal Protection cited the lack of a Chief Veterinary Officer, Minister for Animal Welfare or Commissioner for Animal Welfare as examples of a lack of independent representation in this context. World Animal Protection cited the lack of a Chief Veterinary Officer, Minister for Animal Welfare or Commissioner for Animal Welfare as examples of a lack of independent representation in this context.

1490 Goodfellow, above n 227, at 226

1491 Fisher et al, above n 346, at 37

1492 At 37

1493 Ministry of Agriculture and Fisheries, above n 2, at 31

- The removal of any perceived conflict of interest on the part of the Ministry of Agriculture and Fisheries regarding the administration of livestock production and animal welfare policy.
- The inclusion of animal welfare considerations currently administered by the Department of Conservation.
- An independent balancing up between the needs and views of society and farmers and other animal owners.

Importantly, such a body should also include animal welfare representatives with experience in farmed animal welfare. This is not currently the case.[1494]

Creating a more significant role for public interest groups is important, whether this be in relation to a new independent committee or within NAWAC. Including such groups in regulatory processes would help to ensure balanced, impartial and informed outcomes that reflect the value of all parties. This could mean granting such groups access to information; giving them a seat at the negotiating table; and potentially granting them the right to sue or prosecute under the relevant regulatory regime.[1495] The RNZSPCA currently has this standing in relation to companion animals, being that they are the primary enforcement agency in relation to animal welfare law in respect of these animals. The Chief Scientific Officer for the RNZSPCA is also a NAWAC committee member. However, while other animal welfare organisations are consulted in relation to the development of codes of welfare and regulations, there is no equivalent public interest group in relation to farmed animals in New Zealand to represent their interests.

1494 At present, NAWAC consists of the chief scientific officer of the RNZSPCA; former national president of the RNZSPCA; a retired veterinarian previously employed by DairyNZ; a veterinarian previously employed by Ravensdown Fertiliser Ltd; a farmer and provincial president of Federated Farmers; an animal scientist who previously worked for AgResearch; a retired scientist; a former DOC technical adviser in vertebrate pest management; a layperson with an interest and experience in conservation and pest control; and a researcher with experience in marine mammals. Ministry for Primary Industries "Protection and response" <https://www.mpi.govt.nz/protection-and-response/animal-welfare/national-animal-welfare-advisory-committee/nawac-members/>

1495 Goodfellow, above n 227, at 226

9.4.3 INCREASE IN FUNDING FOR DEVELOPMENT OF ANIMAL WELFARE LAW AND POLICY

At present, none of the NAWAC Committee members are paid full-time salaries. Rather, there is a daily fee paid to committee members and the chairperson, who are paid an allowance for preparation time; reimbursement for travelling expenses; and additional monies paid on occasion where the chairperson or other members represent NAWAC at other meetings, or where they carry out other significant work.[1496] The latest available figures show that in 2016 the Committee were paid the following:

Member	Fees paid during 2016 (gross)
G Verkerk[1]	$9,200.99
I Torrance	$3,522.00
G Doole[2]	-
K Milne	$1,200.00
R Palmer	$800.00
N Poutu[2]	-
K Schütz[3]	-
G Shackell	$4,200.00
A Sharr[4]	-
I Visser[2]	-
J Wagner	$2,400.00

Figure 5. Fees Paid to NAWAC members during 2016[1497]

We have re-drawn this figure to make it more legible, however no substantive changes have been made.

This is clearly inadequate given the number of animals, codes and regulations NAWAC are required to consider.

At present, only $10.8 million or 1.6% of MPI's budget is dedicated to "all aspects of animal welfare enforcement, education and policy advice."[1498] This sum seems clearly out of step relative to the income earned from animal agriculture (being approximately $23.3 billion per annum)[1499] and the public's expectations as to high animal welfare standards. A full-time body focused on ensuring the robustness of the concrete standards regulating how animals live and die is critical if the high-level protections in the Act are to be meaningfully realised.

We reiterate the recommendations made in Ferrere et al's 2019 report that there be an increase in state resourcing for both the development of animal welfare policy and enforcement of the Act, codes of welfare and regulations.[1500] Specifically, there should be an increase in funding for both MPI and NAWAC, or an alternative agency responsible for animal welfare law reform. World Animal Protection has recommended an increase in funding to $100 million.[1501] This figure would be 14% of MPI's overall budget.

1496 As outlined in National Animal Welfare Advisory Committee, above n 890, at 4
1497 As outlined in National Animal Welfare Advisory Committee, above n 890, at 4
1498 Ferrere, King and Larsen, above n 123, at 11
1499 LEARNZ, above n 34, figures from 2016 include dairy; meat and wool and wild capture fisheries.
1500 Ferrere, King and Larsen, above n 123
1501 World Animal Protection, above n 234, at 41

9.5 A PUBLIC OR GOVERNMENT INQUIRY

We recommend a public or Government inquiry into the adequacy of animal welfare law, both in respect of the content of the codes and regulations, and the processes by which they are established. Such an inquiry could assist in achieving the legislative reform outlined above in relation to the codes, regulations and Act, and could ensure that the processes by which the delegated legislation is established are robust. It could also address the level of public funding provided to animal welfare development and enforcement.

Significantly, a public or Government inquiry would achieve reform through public consultation with stakeholders, including industry, animal welfare advocates, policy groups, professional associations, Governmental agencies and the public. The public discussion generated through this consultation would enable the relevant issues to be canvassed from multiple perspectives and for robust decisions to be made that take into account not only the science relating to the codes and regulations, but cultural, social and ethical issues, as well as issues of practicality and economics.

9.6 OTHER RECOMMENDATIONS

There are a number of other measures, which could assist in the development, and implementation of higher animal welfare standards. These are outlined below.

9.6.1 SUBSIDIES

A consideration of subsidies to farmers is important, as this is an additional mechanism that could assist with improved standards of animal welfare. This could come from the Government, or from industry itself. For example, in Germany poultry farmers in collaboration with retailer chains have established a:[1502]

> …central welfare fund, [with] participating certified farms…remunerated for the higher costs of production through that fund. By taking a leading role in setting welfare standards, poultry farmers not only abide by regulations which are scientifically sound and economically viable, but also improve the farmers' reputation in the public. In addition, the farmer's initiatives generate awareness of retailers and consumers on the actual costs of welfare.

We note that at least some of the costs of higher animal welfare standards can be passed on to consumers. NAWAC has recognised this in relation to eggs, noting that demand for this product is likely to be inelastic given that they are an important source of protein; they have few ideal substitutes; and they constitute a small proportion of the overall food budget for consumers.[1503] However, subsidies could still assist farmers in transitioning away from systems with lower standards of animal welfare, for example if colony cages were banned in a transition towards barn and free-range layer hen systems. This would be particularly relevant in relation to free-range systems, given the need to purchase more land and new shedding, and potentially also in barn systems where farmers may have to build new sheds.[1504]

1502 Bessei, above n 1163
1503 National Animal Welfare Advisory Committee, above n 239, at 13
1504 Interview with Michael Brooks, above n 19

9.6.2 COLLABORATION BETWEEN INDUSTRY, THE NATIONAL ANIMAL WELFARE ADVISORY COMMITTEE AND ADVOCACY ORGANISATIONS

The industry groups we interviewed all recognised the importance of high standards of animal welfare. That they value this is evident in their active participation in this report; the information they provide to their members; the education they facilitate for farmers; and in initiatives such as DairyNZ's 'Dairy Tomorrow Strategy' (which has been established with the specific aim of achieving world-leading standards of animal welfare in the dairy industry). Many of these stakeholders also recognised that animals are of course fundamental to what farmers do; that most farmers care deeply about their animals; and that ensuring the welfare of animals is inherently important.

However, as noted at section 3.2, there is a point at which productivity gains in farming can only be made by reducing animal welfare. As such, there is a fundamental conflict inherent in farming between ensuring high standards of animal welfare and maximizing profitability. This tension requires both consumers and Government to play their part in supporting producers in implementing higher standards of animal welfare, and the inevitable increase in costs associated with this. It also necessitates collaboration between industry, NAWAC and advocacy organisations such as the NZALA, to ensure that industry and Government are held accountable for how animals are treated, and that we are all doing our best to guarantee that animals have a good life before they are slaughtered for our consumption. This is necessary because farmed animals are inherently vulnerable and cannot assert their own interests – although they clearly have the capacity to suffer greatly when their physical, health and behavioural needs are not provided for.

We recommend continued stakeholder input from industry organisations into the work of animal advocacy organisations, as has occurred in this report. We also recommend continued collaboration between industry organisations, NAWAC and advocacy groups in relation to improving standards of animal welfare. Such collaboration is crucial in the development of codes of welfare and regulations, so as to ensure that this delegated legislation meets the aspirations of the Act and that New Zealand is truly world leading when it comes to animal welfare.

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The New Zealand Animal Law Association is a coalition of lawyers working to improve the welfare and lives of animals through the legal system.

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