The meat industry and the environment

NAVLE study tips

Dog agility at the RVC

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Network Debate Influence
It is with a heavy heart that I reveal that this issue of JAVS is my last one as editor. It has been a pleasure to get involved with AVS over the past couple of years – I’ve made great friends, and had the opportunity to be involved in discussions and decisions regarding all aspects of veterinary student life – from the provision of sanitary bins at vet schools (believe me, this has been discussed at great length), to improving the support network across all schools and the shaping the future of the profession. The experience has opened my eyes to what can be achieved when we work together.

AVS will continue to champion vet students and stay true to our strapline, ‘Represent, Support, Engage’. We represent the veterinary student body on several BVA committees, at RCVS meetings and we have had significant influence on initiatives such as Vet Futures and Mind Matters, to ensure that the veterinary student opinion is accurately relayed to the other veterinary associations.

This year, AVS has offered a number of welfare grants, which are available for projects that aim to improve the welfare of vet students, animals or the student community and help them to flourish. On top of that, our ‘pay it forward’ campaign aimed to encourage random acts of kindness within the vet student community to remind us all that a simple good deed can really pick someone up if they’re having a tough time.

AVS’s peer support policy has also been implemented to actively encourage support systems within each vet school and provide guidance for those schools wishing to set up new projects, such as peer support. We are in the process of producing a welfare report, which details the provision of support at each vet school to allow comparison and identification of areas to be could be improved.

AVS cannot hope to accurately represent its members if we don’t know what you think, which is why student engagement is essential in order to maximise the resources and connections available. Engagement seems to be primarily through social media (Twitter and Facebook) through the articles, polls and surveys we share, but remember that you can contact your vet school’s AVS Reps at any time with any queries or concerns or anything you’d like to be discussed at any of our meetings. You can also e-mail any committee member directly using the details in the box on the left.

AVS has shown me that, together, we can achieve so much more than we often think we can. We can bring about the changes we want within the profession; after all, it’s our future, so it’s up to us to help shape it. It has been a privilege be a part of AVS – a group of forward-thinking, passionate people who want the best for the people we represent. Although my time as JAVS editor has come to an end, I’m sure your new committee will be just as enthusiastic in ensuring AVS continues to represent, support and engage with its members.

Jordy
Burn’s night celebrations

By Maria Mylne, senior rep (4th Year, Edinburgh)

Robbie Burns (January 25, 1759 to July 21, 1796) was arguably the best Scottish poet of all time, writing timeless classics such as ‘Auld Lang Syne’, which no student could go through a Scottish university without learning. The ‘Dick’ vet school celebrates his amazing work annually . . . with a Burn’s night supper.

Mike Grieve, the head of student support, did a wonderful job stock- ing the bar (even if we did drink it dry) and great food was provided by the university’s catering services. The Dick vet musicians got the evening off to a wonderful start and this was quickly followed by the famous ‘parade of the haggis’. A fifth-year student piped in the haggis to loud applause. She has piped brilliantly every year since first year, so it’s going to be a tough job for someone to live up to next year.

Next, came the traditional speech- es. Kelly Wyper, president of the Veterinary Student Council, remind- ed us of the great achievements the Dick Vet over the past few months, not least being reaccredited by the American Veterinary Medical Association, and achieving victory on the sports field in the annual ‘Dick Day’ event against Glasgow vet school. David Argyle (head of school) had a tough act to follow, but he delivered an amusing speech.

The quiz that followed allowed students and staff to work together, revealing unlikely knowledge of Disney films and hard rock music. With the bar dry shortly after, the evening conceded with a rowdy chorus of ‘Auld Lang Syne’. I don’t know whether Robbie Burns would have appreciated our celebrations but one thing’s for sure, I’m glad to be a Dick vet!
Music at Liverpool

By Georgie Ferguson, Liverpool vet school conductor (Final-year)

Quite a few vet students seem to have been involved in music before coming to university. Whether we’ve been forced into lessons as a child, enjoyed choir at school or working through grades, music is one of those well-rounded qualities lots of vet students pop on their UCAS application form.

Vet school can, at times, seem like a lifestyle rather than a degree, and for that reason a previous passion and time for music can often be lost. Liverpool vet school annually runs a Christmas choir and everyone, including staff, clinicians and students may join. Each year, after a mere 10 weeks’ practice, a well-attended carol service is held at the local church, then choir ends and everyone goes back to study/sleep on Monday evenings for another year.

Last December, however, the vet choir upped the carol service with a mash-up of ‘Little Drummer Boy’ and ‘Peace on Earth’, transcribed by final-year student James Bladon, and searched for another opportunity to sing. We didn’t have to look far—we arranged to spend an afternoon at Clare House, a local children’s hospice, singing carols. Encouraged by the feedback from the lovely kids and staff, and unwilling to give up singing until next Christmas, the vet choir is back practising for our next ‘gig’. Squeezed in between 4th and 5th year exams, we have a visit planned back to the hospice to sing hits from Disney, and, on the same evening ‘A Night of Music’ in the vet lecture theatre. The first time conductor, enthusiastic students, dedicated staff and a bongo playing pathologist have meant that giving up one evening a week for a social music session isn’t too difficult at all. After all, you sing when you’re happy and you’re happy when you sing.
Every year, the Glasgow University Veterinary Medical Association (GUVMA) organises the annual GUVMA Rodeo. It is a family-oriented day that aims to provide fun and entertainment for everyone, while supporting charitable causes related to animal welfare.

This year, Students for Animals In Need (SAIN), Trusty Paws, Guide Dogs for the Blind Association and Horse Rescue Scotland, will be the main beneficiaries of our GUVMA Rodeo. Riding for the Disabled will also benefit through our annual raffle ticket sale.

On the day, there will be plenty of commercial interaction with local business and charity stalls all over the Garscube Estate. These will include animal welfare charities, handmade crafts, food and drinks, as well as opportunities for animal handling, games, attractions, face-painting and much more. Animals and birds will also be given the opportunity to showcase their skills; for example, with falconry flying and handling displays to guide dog demonstrations.

There will be plenty of activities to keep the whole family entertained for the entire day!

The rodeo will be held on Saturday, April 16, 2016 from 11 am to 5 pm at the Garscube Estate, Switchback Road, Bearsden, Glasgow. Find out more about the rodeo by following us on Facebook – 56th Annual Rodeo 2016.
On January 29, 11 members of the Royal Veterinary College’s Veterinary Business Management Association (VBMA) attended the Society of Practising Veterinary Surgeons congress in Newport.

We took part in the ‘New to Management’ stream, hearing from speakers such as Brian Faulkner and Nick Steele. They covered the basics of business management (the practice engine room, business goals and where the money goes) and the essential role that marketing and communications (macromarketing concepts and creating and delivering your practice marketing plan) play in keeping a practice alive.

We learned that business success comes down to four main pursuits: clinical resolution, client satisfaction, financial performance and team harmony and happiness. Brian also provided an insight into how we can create, reach and monitor the success of our goals in these areas.

‘Marketing and communications in practice’ outlined the variables that determine why a client might choose to visit or leave your practice, how to go about designing and delivering a marketing plan, and how to measure the results of your marketing effort. Finishing off the talk series, we encountered the concept of high morale enabling high productivity and a profitable business alongside some of the psychology behind morale, culture and motivation. Once again, Brian gave practical advice on how these can be managed and considered with regard to every member of the practice team.

Of course, as all-discerning students, throughout the day we also accumulated freebies en masse, and made sure to hit each and every last food and coffee stand!

Issues trending

We then attended the much-anticipated session involving Noel Fitzpatrick in conversation with Martin Whiting, lecturer in ethics at our very own Royal Veterinary College. Noel is both inspirational and controversial in the eyes of many in our industry – is he doing groundbreaking work, paving the path to a future of increased therapeutic possibility, or is he doing more harm by raising public expectation of a veterinarian’s capability with shows like ‘Supervet’?

After introductions and a brief biography, Martin got things under way and introduced a common ethical dilemma faced by scientists and medical professionals alike: ‘Just because we can, does that mean we should?’ He then asked Noel what motivates him to work such crazy hours and push boundaries in the way he does. ‘What motivates me? The four cases I had last night . . .’ Noel started by expressing concern for what was best for each individual animal and argued that as a profession, he said we had been left behind as far as innovations in human medicine were concerned. He suggested that the real irony of technology available in human medicine was its rigorous testing on animals before approval for use in veterinary medicine, and yet this information is minimally harnessed for use in the veterinary field.

Noel advocated a ‘One Health’ approach and pointed to a ‘missing link between human and veterinary medicine’ with regard to information sharing.

At this point, Martin directed Noel to tell us more about his process in deciding what cases he chooses to pursue, namely in cases of prosthesis. We heard about Noel’s three-step decision making: including ‘ethical triage’, ‘grand rounds’ and ‘external engineering consults’. After hearing a lot about the proverbial ‘Freddie’ and ‘Mary’, it’s clear that these decisions aren’t made lightly. The faux pas of the interview comes in the form of Noel, unknowingly, asking the BVA president, Sean Wensley, had asked his question to make Noel look like an ‘axxxxxx’. After Martin informed him of the gentleman in the second row’s identity, raucous laughter filled the room.

It was deduced that a lack of ethical framework for veterinary surgeons facing such decisions – whether to use researched, tested techniques in application of novel
veterinary therapy – made this area a grey one. When questions were taken from the audience, Bradley Viner (RCVS president) said that the RCVS was ‘keen for advancement’ in the veterinary field, adding that it was in the process of setting up an ethical review panel system to help those in practice make such decisions.

Other questions included one from intercalating BSc(ComPath) student Joanna Hindle asking: ‘Should your TV programme show more of the bad light?’, to which Noel responded ‘get ready to cry next season!’ Fellow BSc(ComPath) student Colin Clarke asked: ‘What do you see for the future of veterinary medical education?’ to which Noel expressed his opinion that in the next 20 years early tracking would be the key to increased career fulfilment and advancement within the veterinary field.

It was great getting students involved in an opportunity to rub shoulders and network with some inspirational professionals in our field and to stimulate thought beyond the lecture hall.

A special thanks to Mark O’Byrne from Hills for sponsorship, SPVS for inviting us and RVC VBMA president Claire Willis for organising it. Without such support and funding, it would not be possible to attend or host such events. Find us on social media for info about our upcoming talks, workshops and our May Symposium.
Doing it doggy style – pawsitive about education

By Liana Coetzee (3rd Year, RVC)

September 2015 marked the inauguration of a fabulous new club at the Royal Veterinary College – the RVC Student Union Dog Agility Club. This club requires no hand-eye or eye-foot coordination and zero creativity, plus it gets us and the dogs – who I’m sure sometimes wish they had non-vet owners – out of the house and doing something positive and mutually rewarding together.

Come rain or shine, once a week on a Thursday evening, we meet and use our dogs as an excuse to show off newly learned tricks and socialise with new people within the university. However, the club has another role to play aside from laughter, conversation and socialisation – it allows dog owners to fully focus on their pet for an hour every week. Quality time spent with your dog becomes increasingly hard as more and more uni work and placements take up our time, especially in later years. We are always asked why we want to be vets and many of us simply answer, ‘I like animals and want to help them’, but not everything can be learned through textbooks.

The fundamental significance of the human-animal bond is increasingly stressed in the veterinary curriculum and students are showing a lot of interest, highlighting the desire to learn more around animals and how they work physically and cognitively. The agility club is based at Halo Dogs in Enfield, where the founder and master dog trainer, Justin Kumaran, has repeatedly emphasised to me the importance of creating this bond with your pet and how agility and the time it provides us with them allows us to do this. Our club is not about competing, it’s about building up a supportive community and spending time with our dogs.

Justin says: ‘When a dog is born, it knows nothing other than having its natural instincts. It’s no different from a new born human baby. A dog needs to be taught the behaviours we expect it to have, much like when a human child goes to school. Inadvertently, by teaching and educating we are also teaching life skills and helping a dog mature and also helping the dog understand the hierarchy of the family unit in which it lives and the wider world around it. All too frequently in modern society we are seeing dogs bought and loved but nothing else. The net result is often an unbalanced dog that doesn’t fully understand the world around it, nor its place within it. And in the absence of an education, a dog has nothing to rely on other than its instincts to handle situations, such as using aggression towards vets when confined to a small white room.’
It was because of this that Halo Dogs coined the phrase: ‘Because Every Dog Deserves an Education!’

‘Agility is such a great thing to do with your dog. When else do you get to teach and reinforce commands over and over again for an hour; while the dogs are active and enjoying themselves and having fun? When else do our dogs get to participate in an activity which they themselves can improve on week after week while improving their confidence levels and sense of accomplishment and achievement?

‘Agility helps keep your dog active, fit and healthy, possibly for the humans too and it gives a dog something to do and a sense of purpose as well as giving them something they can improve on. Doesn’t every vet want to be the best they can possibly be?

‘Of course you don’t need an agility course to make this happen. You could make use of what you find in your local park, but in reality it is much easier with a laid out course and a controlled environment.’

Everyone who has attended the classes has been very positive, praising agility for helping them and their dogs. The confidence it gave their dogs was a factor frequently brought up, with several dogs being said to be ‘nervous’ or ‘unsociable’ in human terms now being described by their student owners as more confident. All the dogs’ behaviour has improved in leaps and bounds, especially when it comes to inter-dog social skills. Clearly we can’t ask the dogs themselves how they feel about agility, but the fact that we are able to go on group dog walks and have them play together can’t be a bad sign!

Through the continuation of this club I hope to allow more students and dogs to build up their bond and socialise with other humans and dogs. The support I have had from everyone both within the RVC and at Halo Dogs has been brilliant. We have created a community without judgement, where we can all learn more about the species that many of us are destined to work with.

I have really enjoyed bringing this club to life and will hopefully find someone else to nurture it further in the next few years, but I would greatly encourage other vet schools to start a similar club and reap the rewards!
NAVLE study tactics from a survivor

By Marissa Silva (Final-Year, Dublin)

Thinking about working in North America after graduation, or maybe doing the internship match? If so, you'll have to take the North American Veterinary Licensing Examination (NAVLE). Preparing for it is a long process, and there's more to it than just sitting down to complete a six-hour multiple choice questions exam.

As it turns out, there is not a lot out there on the Internet with regard to study plans. In this article, I'll try to summarise a few goals and study practices that I set for myself, as well as those I've gleaned from my friends, so that hopefully you'll be able to benefit from them. However, don't take these notes as the end-all and be-all to your success. It's going to feel like all you want is to summarise a few goals and study practices that I set for myself, as well as those I've gleaned from my friends, so that hopefully you'll be able to benefit from them. However, don't take these notes as the end-all and be-all to your success.

Getting started

- Are you eligible? Check the current American Veterinary Medical Association (AVMA) accreditation. There is additional testing and paperwork required for North American licensing if your school is not accredited. For a list of accredited schools visit AVMA's list at www.avma.org/ProfessionalDevelopment/Education/Accreditation/Colleges/Pages/colleges-accredited.aspx
- Register for a study aid: There are a few options for studying for the NAVLE using a program. Vet Prep and Zuku Review are two predominant companies. Many vet schools have representatives that advertise sales beginning in January and run to summer. If not, both companies often have ‘special offers’ available online.
- Personally, I loved the ‘power lectures’ from Vet Prep, and thought they were well worth the extra $50 or so for the ability to listen to a concise mini lecture while doing the dishes or on the bus.
- Zuku Review is a tried and trusted program too, although I have not used it personally. Shop around, but I highly recommend studying using some kind of program, in addition to studying your school notes. Not only do the question types mimic the unique NAVLE format, but the subject matter is highly representative of what the exam will feature.

Passing the vet boards . . . is there an app for that?

Unfortunately not yet, but the web browser on your smartphone will allow you to access the site from the bus, walking around campus, or even your couch.

- Register to Take the NAVLE
  - (a) Letter of Good Standing from School. You will need to write to your veterinary school's front office, providing them with your student number and full address of the destination. Do this early (right after you take exams is perfect timing).
  - (b) Register with your state: The letter from your school will be sent to the state you are registering to take the NAVLE through. It's best just to pick one, and research its specific due dates. A lot of my classmates ended up having to transfer their results when they decided to pursue jobs in other states. Don't over think it, but pick one without too many additional testing requirements (states such as California have additional state-specific boards, so be extra clear on what is required on a state-by-state basis).
  - (c) Register with the National Board of Veterinary Medical Examiners (NBVME) and pay the fee (in 2015 the cost was $605, with an additional fee of $282 for taking it internationally).
  - (d) Wait: the NVMBE will send you an email around September, which allows you to register with Prometric Testing Centres near you. Book early so you can get a good time and spot (give yourself a few days break from rotations or EMS before final study cramming and research).

If you are in rotations while studying (which is highly likely), prepare to feel squeezed between the workload of rotations and cramming. It's going to feel like all you want to do is run home and study, but finding a healthy balance and using your NAVLE study to help you with rotations is important. Try narrowing down big subjects or focus your study around a case already in clinics.

There are several topics that the NAVLE traditionally focuses on, more so than the average veterinary school curriculum. For example, causes of pig and calf diarrhoea, as well as toxic North American plants are covered in multiple questions. There will also be obscure fish and bird questions, but the main focus is companion animals and food animals, especially sheep and cattle.

Plan Your Study

- Start: I began to casually study in June with my intention of testing in November, then daily from the second week of August (three months before my exam). You can modify the study questions by subject, which can help with rotations.
- Progress: Vet Prep practice questions take more time because you
must go through them one by one; the tests are quicker to get through the program. Note how many hours it takes you usually to achieve one per cent (you’ll underestimate it). If your goal is to make it to 100 per cent, multiply the time it took you by 100. In the end, the time frame may be slightly less than that to reach 100 per cent, as the program goes faster as you gain familiarity with the material (and there are repeat questions).

■ One month prior to exam: Now is the time to really commit to studying. Cramming extra hours at the last minute in is not fun, nor is it conducive to storing the information long term. I recommend that you aim to be 75 per cent through your study program the month before your exam.

Final study notes

■ Practice exams: the NBVME also has five smaller practice exams at $50 each. Taking these gives you a better perspective of how the exam is going to go, especially compared with previous years. I took two practice exams the weekend before my exam, but if I could do it over again, I’d do one a week, starting five weeks before.

■ Completing Your Prep: It is possible to finish 100 per cent of your study program. Not all of my class did, and you don’t have to in order to pass. I wanted to get through it to get my money’s worth (at the time of this article, you get a free renewed subscription if you finish 80 per cent and don’t pass the first time). The best thing you can do is to decide early on whether you are going to finish it or not, and then track your progress. There is no use putting additional pressure on yourself if it’s not actually going to help you achieve a passable score.

■ Be organised. I recommend buying a big notebook, labelling big sections of blank paper by species, and whenever you get a question wrong, write a good note about it. Review these frequently, even before bed a couple times a week.

■ Be happy. No, not about the exam, but continue to live your life! Take study breaks, listen to music, go outside. This will likely be the longest test-prep marathon of your life, and going crazy and freaking yourself out will not help you. Tackling real world applications is what you should be concerned about. This is your chance to prove to yourself how much you really know!

■ Day of the exam: Be well rested, make a pre-exam music playlist (author strongly suggests Queen’s ‘We Will Rock You’ and Survivor’s ‘Eye of the Tiger’) and buy yourself something nice to eat for your snacks and lunch. This is a six-hour exam if you use all the time, so plan accordingly, and relax!

Good luck and remember, it’s only an exam. You’re going to do great. Assume you’re going to pass until proven otherwise!

Additional resources

General Information
https://www.nbvme.org/navle-general-information/navle/

Regulations By State
https://www.nbvme.org/?id=78&page=NAVLE#Application_Pprocedure_Chart

Zuku Review
https://zukureview.com/

Vet Prep
http://www.vetprep.com/newsite/
Healthy post-placement meals

By Amelie Geddes, AVS marketing rep (Final-Year, RVC)

There are many nights that all those of us on placements, whatever stage in the course, can’t quite get up the energy to cook a proper evening meal and end up resorting to the likes of pasta, toast and (we’ve all been there) biscuits for dinner.

Such dinners may be okay from time to time but they’re not very healthy for the long term … Recently, I challenged myself to make healthy, easy meals - here are a couple of them. Both of these recipes serve two and make a handy lunch for the next day.

**Green thai curry with vegetables**

*Ingredients*
- Half a small leek
- Handful of green beans
- 3 leaves of spring greens
- One small onion
- 1/2 can bean sprouts
- Teaspoon of ready chopped ginger
- 1 can coconut milk
- 1 teaspoon green thai curry paste
- 1 clove garlic
- Pinch of salt
- Drizzle of olive oil

*Method*
1. Place a deep pan on the hob at medium heat with a drizzle of oil.
2. Peel and chop the onion and garlic and add to the pan.
3. Chop the beans, leaves and leek and add them to the pan. Followed by the bean sprouts.
4. When all is softened add the paste, ginger and coconut milk. Stir and season to taste.

**Parsnip spaghetti carbonara**

*Ingredients:
- 6 parsnips
- 1 egg
- 80 g cubed pancetta
- A grind of pepper

*Time:* 5 minutes preparation, 5 minutes cooking time.

*Method*
1. Place boiled water from the kettle in a pan and add a pinch of salt. Place the pan on a medium-high heat.
2. Peel, top and tail the parsnips. Once the peelings are discarded continue to peel the parsnips into a bowl spinning the parsnip as you go until it is too thin to peel. Then chop the remaining parsnips as thin as you can.
3. Add the parsnips to the water for three minutes.
4. Drain the parsnips and place them back in the pan.
5. Add the pancetta cubes and break the egg and pepper into the pan.
6. Stir well until the egg and pancetta are cooked and serve warm.

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vetrecordcareers.com
The natural world is an outstanding source of useful drugs, as many scientists have discovered over the centuries. This article discusses how plants have contributed to 21st century veterinary medicine and why we should be grateful to certain members of the plant kingdom.

The plant of dreams
It is widely argued that there has been no greater pharmaceutical discovery than the extraction of morphia, which would later be called morphine (named after Morpheus, the Greek god of dreams), from the opium poppy, *Papaver somniferum*. Morphine is a naturally occurring alkaloid in the resin of the poppy, alongside the other familiar opiate, codeine. Not only has morphine established itself as a gold standard first-line analgesic, it has been used as the parent compound to produce an array of synthetic drugs, called opioids. Methadone, now licensed for analgesia in dogs and cats in the UK, is one such example.

In veterinary medicine, opioids have allowed potentially painful surgeries to be carried out with animal welfare at the fore. The synthesis of potent, but short-acting, opioids, such as fentanyl and remifentanil, have gone one step further in analgesia and are used mainly in hospital settings as continuous rate infusions (CRIs) during painful surgery. The remote chemical capture (darting) of free-living wildlife and captive zoo animals for research or veterinary purposes has also been revolutionised. The opioid etorphine, known to those in the zoo and wildlife sphere as ‘M99’, is an incredibly powerful drug; as little as 2 mg has been used to anaesthetise elephants (Stegmann, 1999).

However, there is a darker side to the discovery of opioids, which has led to their strict control. The morphine derivative diamorphine, better known as heroin, was originally marketed as a cough suppressant in people by German pharmaceutical company Bayer, but would later become one of the world’s most abused, addictive drugs. The discovery of opioids was to come with a heavy price.

Pain blocked out
Another plant to which veterinary medicine owes much is the coca plant, *Erythroxylum coca*, perhaps best known in people for the psychoactive alkaloid cocaine. Cocaine was the gateway to the discovery of another class of drugs that vets (and doctors) consider indispensable in
the 21st century: local anaesthetics. These are the only true analgesics; other drugs such as opioids and NSAIDs are hypoalgesics, in as much as they reduce sensitivity to pain, but do not directly block nerve impulses involved in the generation of pain sensation like the local anaesthetic drugs. Local anaesthetics are synthetic derivatives of cocaine, but a lot safer and nowhere near as addictive, and have found a core role in modern day veterinary practice: dental nerve blocks, Caesarean sections, castration . . . the list goes on. It would be unthinkable now days to imagine modern veterinary practice without local anaesthesia, and all thanks to a single plant found in South America.

Managing degenerative heart disease

The opium poppy and the coca plant have both contributed massively to veterinary anaesthesia. But plants have been responsible for other important, widely used drugs. Take the common foxglove, Digitalis purpurea. It happily grows in many gardens and woodlands in the UK, but contains digoxin, which is probably one of the most dangerous drugs routinely prescribed in first-opinion practice. Digoxin is known as a cardiac glycoside, and is dangerous because of its relatively low LD50 (lethal dose, 50 per cent; the dose that would kill 50 per cent of a test population). This is also known as having a narrow therapeutic index. It is used in tiny quantities in the management of chronic congestive heart failure in dogs (and people), and works to slow heart rate, at the same time as increase the heart’s contractility. Digoxin has benefited many dogs with congestive heart failure, allowing the condition to be managed effectively.

More than just attraction

The final example of a fascinating plant with medicinal use is the deadly nightshade, Atropa belladonna. Belladonna in Italian means ‘beautiful lady;’ in times gone by, women would use drops of Belladonna extract in their eyes to dilate their pupils, making them appear more attractive. The plant contains two important alkaloids, which are still used in some form: atropine and scopolamine (also known as hyoscyamine). They are antimuscarinic drugs that interfere with the action of acetylcholine, thereby stimulating the ‘fight or flight’ responses. Clinically, atropine is an essential drug in a practice ‘crash box’, used to counteract bradycardia, and is also used in some ophthalmic conditions. Butylscopolamine (trade name Buscopan) is synthesised from scopolamine extracted from a plant in the same family as the deadly nightshade, and used as an antispasmodic in horses with colic, and in calves as a symptomatic treatment of scour; to name just two of its uses (Boehringer Ingelheim 2016).

Discussed here are just four plants that have had a large role to play in the contribution of drugs that modern medicine, both human and veterinary, consider essential. There are many others that have been found to contain useful compounds, and who knows what the future may bring? There may be many more drugs hidden away in the plant kingdom that we have yet to discover.

References


Veterinary oncology

By Jess Timmins, Senior Rep (3rd Year, RVC)

Dealing with cancer in animals will always be different from an average case/consult. Clients often associate cancer with personal experience; a relative or friend that has been treated. It is important to discuss with the client from the very beginning that cancer treatment in dogs and cats has a different aim – to maximise quality of life, not length. This adds a new dimension to cases and is where our communication skills and professionalism can help to get the best possible outcome for our patients, with the care and understanding of our clients.

New cancer molecular research

The good news is that treatment for cancer is rapidly evolving. Hanahan and Weinberg’s well known research paper ‘Hallmarks of Cancer: The Next Generation’ is providing a foundation to inform novel therapeutic development, and far from the traditional anti-cancer drugs, which just targeted the hallmark ‘resisting cell death’ new therapies are now focusing on other ways to attack and destroy cancer, as demonstrated in the figure from the paper (Hanahan and Weinberg, 2011).

Having these targets for cancer treatment allows us to use combination therapy, targeting multiple hallmarks. This has many advantages for the patient, as we can reduce the dose of each individual agent so there will be fewer adverse effects on healthy cells as therapy becomes...
more targeted. The use of tyrosine kinase inhibitors is an example of this type of treatment in veterinary medicine. These drugs allow us to target 'sustaining proliferative signalling', for example in canine mast cell tumours where KIT receptor gene mutations are often found. This receptor has tyrosine kinase activity and is overexpressed in many tumours to allow self-sufficiency of the tumour. These drugs also target 'inducing angiogenesis' as vascular endothelial growth factor receptor also has tyrosine kinase activity, so inhibiting it can stop further angiogenesis necessary for tumour progression.

Another particularly hopeful development is telomerase inhibitor drugs, which are currently in clinical trials. These drugs stop telomerase enzyme, which is upregulated in cancer cells, adding new telomeres on to the ends of chromosomes in order to prolong cell life.

Research
Rodent studies have revolutionised our ability to study cancers in vivo. But what about studies in companion animals? Does this strike fear into the depths of our pet loving hearts? Or is it a serious, sensible and successful method of investigating cancer and assisting us in finding cures sooner?

After some further reading, I believe there is a role for these types of studies. When you consider human cancer research, the application of companion animal studies could be exceptionally useful. Of course the typical mouse model has several advantages, but, unfortunately, the average rate of successful translation from rodent models to clinical trials in human patients is less than 8 per cent.

Naturally occurring tumours in dogs and cats have more clinical and biological similarities to human cancers than any other animal cancer model: spontaneous cancers in dogs are influenced by age and environment, they occur in animals with intact immune systems, tumours are heterogeneous and metastasise to distant sites, all factors capturing the essence of human cancer better than any other model. The significantly shorter disease-free interval in dogs (18 months as opposed to seven years in human beings) allows us to assess treatment outcomes much faster. It is interesting to think of what we could achieve in terms of human cancer research by using companion animals in safe, regulated studies.

Every individual is different
When it comes to cancer treatment the saying ‘just because we can, doesn’t mean we should’ becomes very pertinent. It is important to maintain communication with the owners, and discuss what is acceptable quality of life for their pet from the outset. New cancer treatment in pets can actually give them a better quality of life for a longer period of time than pets receiving treatment for chronic heart or kidney disease. So of course ‘just because we can, doesn’t mean we should’ and animal welfare should be paramount and championed by any vet, but cancer shouldn’t always be seen as a death sentence to our pets and treatment options, particularly referral to specialist oncologists who are at the forefront of research, thoroughly and objectively explored, with the whole clinical picture in mind.

References
The thought of being a vet in just a few short years is a daunting one, and the prospect of dealing with something more exotic in the consult room even more so. But the number of exotics owned as pets in this country is increasing year on year, each with their own ‘normals’ and ailments. My own pets vary from the feathered, scaled to the fluffy, giving me a bit more of an insight into how a vet deals with different species.

In particular, two of my three bearded dragons, have had infections over the past few months. One suffered from ‘tail rot’ and another had a secondary infection following a suspected broken tibia/fibula. The pair have now been nick named Mr and Mrs Stumpy for obvious reasons.

In case you have not come across them before, bearded dragons are lizards – originally from Australia – that have spiny scales and have a large throat pouch. They live off ‘greens’ (mine particularly prefer kale) and live food such as locusts. They require vitamin supplements, particularly calcium, an ultraviolet lamp, a heat lamp, a heat mat and, ideally, a large vivarium where they can climb and explore. They do not enjoy the company of other bearded dragons and adults introduced to one another inappropriately may fight. Young bearded dragons kept together may munch each other’s toes if not given large amounts of live food, so it is common to come across bearded dragons with missing digits.

The physical exam undertaken of both of my bearded dragons followed the expected pattern of a dog or cat, just with different normals: heart rate (60 to 80 beats per minute), respiration rate (6 to 12 per minute) and temperature 35°C. The approach of my veterinarian could not be faulted, with an honest explanation of her previous experience, admitting she had never removed a bearded dragon’s leg before, but going through the rationale with me both before and during the surgery. Similarities were drawn to a dog or cat hindlimb amputation at the mid femur, leaving enough muscle and scales to cover the end of the bone. The aim to keep the C shape above and below the incision enables closure of the wound and cutting through any large scales is avoided. Tail amputation is similar, but the incision is made between tail vertebrae. Both surgeries were initially classed as clean contaminated, until, during the leg amputation, Mrs Stumpy decided that isoflurane was not good enough and tried to climb off the table.

The intubating tube was modelled out of a catheter attached to half a 5 ml syringe surrounded by bandage that could then sit in the tube from the anaesthetic machine. The monitoring for the surgeries was difficult due to size of patients, so a Doppler was used with the sensor bandaged to sit on the dragon’s chest. The actual anaesthetic drug protocol was the same with all injectables given as expected (never inject in a scale, but always under it). Scarlett resisting the anaesthetic demonstrated that different animals can react differently to the same drugs, and the vet suggested this is more common in reptiles.

Both were placed on cat Metacam (meloxicam) and Baytril orally once a day for 14 days following the surgeries (and, due to when the surgeries could be scheduled, both dragons had received both drugs for a few days prior to the surgery).

Mr Stumpy, otherwise known as Red, whose tail was amputated has done incredibly well with the wound fully healed, regardless of him eating part of his remaining tail off, sutures and all. His ‘Mrs’, Scarlett is still waiting to have her sutures removed, but is already happily back to catching live food.
As I write, it's that time of year when second- and third-year students are being bombarded with information about why they should intercalate; with lectures throwing statistics at them about how it can broaden their horizons and open up postgraduate opportunities. However, while a lot of the benefits of intercalating do relate to life postgraduation, I believe that it also has a positive impact on the remainder of your vet studies.

I intercalated between my second and third years to study for a BSc in comparative pathology. The course involved two modules covering general pathology and more specifically immunology and microbiology/virology and an eight-month research project.

So do I think that my intercalated year made clinical years easier? The simple answer is, yes, I think it has. The next question is, how?

The most obvious way it helped was through the more in-depth teaching I received in pathology; from the pathophysiology and pathogenesis of many diseases to the interpretation of clinical and anatomical pathology cases going through the pathology service here at the Royal Veterinary College. This teaching has made diseases taught in the clinical part of the course easier to understand and remember; as I understood the underlying mechanisms of how they cause the lesions and their impact on the body. Furthermore, the histology teaching has made it easier to learn microscopic anatomy, which then cements the pathophysiology: it helps relate structure to function.

Apart from the obvious extra material I learned during the intercalating year, it also helped prepare me for my clinical years at the RVC in other ways. For a lot of students, the word research is full of fear and dread; I know it was for me. But, after doing a research project for eight months, my perspective changed. Skills like critiquing papers, basic laboratory techniques and troubleshooting problems all directly helped me through my EMS. Also, due to the contacts I made through my intercalated year, I was lucky enough to receive a $1000 travel grant to attend the American College of Veterinary Pathology meeting in Atlanta in 2014, a truly memorable experience that broadened my horizons!

There are other benefits from intercalating; such as learning other academic skills. Taking a year out of the extremely busy veterinary degree can be a rewarding task. With less lectures crammed in and lab work, which you can schedule (to an extent) means that you can actually have a life at uni outside of studying. For me, it was also lovely to have a summer break with no placements (as all my other uni friends had) to help me relax and recharge before I entered the clinical part of the course.

I realise that many people think intercalating is not for them, but I hope my experiences have shown another side to intercalating that you might not have considered before.

Knowing what I know now, I would not change my decision to intercalate and wholeheartedly recommend it to anyone who is considering it.

As a vet student, my love of animals is at the heart of my beliefs. The feeling that we should care and have an affection for animals is what lead me to the veterinary profession in the first place. It is also what drives me to continue my meat-free lifestyle, despite any difficulties I may come across.

I, unlike many other vegetarians, did not make a conscious choice to give up meat and animal products. I grew up in a vegetarian family, and although I always had the option to eat meat if I wanted to, I have always chosen to stick with a meat-free lifestyle – a choice I am proud of. I am not alone.

Vegetarianism and veganism appears to be relatively common in the vet student population. A Vegan and Vegetarian Society (VVS) has just been founded at the Royal Veterinary College for the growing number of students interested in cutting down the animal products in their diet. The society welcomes everyone – whether a meat-eater or not – as the aim is not to convert people to a meat-free lifestyle, but to encourage cutting down the animal products in your diet, and the sharing of vegetarian and vegan recipes and events.

It can be difficult

Being vegetarian isn’t all plain-sailing. There is still a lot of prejudice and
misinformation out there. The first thing most people ask me when I tell them I am vegetarian is ‘how do you live without bacon?’ This is not difficult for me as I have never eaten meat or fish, so I have no craving for it. I am sure, however, that for meat-free converts it is more difficult to live without foods they have been accustomed to eating.

But vegetarianism is now widely accepted. It is easy to eat out, and cooking without meat is easy and tasty – even if it might take a little bit more research to create something nice. I live with four other vet students, and we cook together every night. We have had no problem creating a meat-free option for everything that we make. I hope they would agree that living with a vegetarian has opened their minds to the possibilities of meat-free cooking. It is not bland and boring as many people still think.

Personally, I have had no problems on my EMS with respect to food, although I know other vegetarians who have. I have not stayed anywhere that the farmer or their family would need to cook for me, so that has not been an issue. Even when I have told the farmers that I am vegetarian, they are very accepting. As the majority of vegetarians have probably found, most people have no problem with vegetarianism, so long as it is not pushed on them. Equally, I have no problem with people choosing to eat meat, so long as they don’t try to push their views at me either. Although I don’t buy the product that many of the farmers are producing, I don’t believe that affects my ability to do my job well. If anything, I would say that I am even more invested in the welfare of these animals.

**Do you drink milk and eat eggs?**

There is still a lot of confusion about the difference between a vegetarian and a vegan. Vegetarians do not eat meat, fish or by-products of the meat industry (such as gelatine and rennet), but they do eat dairy products (milk, butter; cheese that does not contain rennet) and eggs (preferably free-range). Vegans do not eat meat, fish, by-products, dairy or eggs – anything that is produced by an animal, often including honey.

**So why should you bother?**

There are many benefits of being vegetarian. From health benefits such as lower incidence of obesity, coronary heart disease and Type 2 diabetes, to the environmental benefits of reducing your carbon footprint. Many of these benefits can be felt to some extent by just reducing the amount of meat you currently eat, and choosing good quality animal products. Having a meat-free day each week is a good start to being healthier and improving your cooking skills – it’s also good for the bank balance.

Being a vegetarian vet student is a joy, and I would recommend giving veggie food a go. For more information and recipes visit www.vegsoc.org/
Vet of all animals, master of none

By Will McLean (2nd Year, Glasgow)

Vet students will be entering a profession that looks very different today than it did even 20 years ago. Is it time for the profession to think about specialising in certain areas even at vet school?

Gone are the days of vets like James Herriot, travelling over the Yorkshire Dales in an Austin 7 to treat a shorthorn cow with milk fever in the morning before returning to the surgery to fix a dog with a thorn stuck in its paw. It seemed there was nothing a bucket of hot water, some soap and a towel couldn’t fix. Since then practices have become (well, a lot more modern for one thing) increasingly leaning to a particular aspect of general practice, be it small animal, equine or farm. There is an ever decreasing number of truly mixed practices, accounting for just 38 per cent of UK practices (RCVS 2014), these are the practices that many aspire to work in when we enter the profession.

Many a time have I heard one of my coursemates curse under their breath when asked nonchalantly by a teaching clinician to name the breed of cattle standing in front of them. While not having a clue they rack their brains to come up with the least ridiculous answer they can. ‘But I’m not going to be cow vet’ they say, hopefully, as if it will exempt them from ever crossing paths with one again in their five+ years of vet school.

I could only sympathise when one of my peers from Singapore faced a pen of ewes and, after being shown how to catch and tip one, she had to do it herself. She said it was the first time she had handled a sheep, I’d wager she’d seen very few beforehand and from the day she graduates she will probably never work with sheep again. This does work both ways however; my repertoire of dog breeds is severely lacking and I’ve been more fearful of handling a rabbit incorrectly than sticking an electro-ejaculator up the business end of a bull.

Vet students’ aspirations are different today. More and more vet students at vet school today will have a much better idea of the side of general practice they wish to focus on. Call me closed-minded, but I have no, or very little, intention of working with anything other than cattle or sheep after I graduate. In my time at vet school, I would love to be able to dismiss lectures purely aimed at small animal and have more time for learning about what I’m really interested in. Yes, the option is there in final-year to direct your rotations towards your favoured aspect and yes, your EMS is completely your choice (in some schools) and you can do as much or as little in any aspect you like but what if you could focus it even more? If you had the option to aim the last two years of your course to solely what you will practice in, wouldn’t that lead to more competent new graduates in their chosen fields?

It’s not the first time this question has been asked. In the 2012 AVS survey, students were asked if all aspects of veterinary medicine should be taught, and a sizeable minority (20 per cent) said no. This does leave an overall resounding yes for the status quo, but I’d argue that this may change during our working lives and, at the very least, gives us food for thought.

Change would be a bold move. The argument for new graduates being equipped with a sound knowledge and competence in practising in all species may well outweigh what I have suggested here. But as time goes by and practices evolve to suit demand, I predict calls will grow louder for the option for vet students to focus on fewer species so that newly graduated vets can flourish in their desired sector, and in the modern profession.

Reference
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Food for thought. How the meat industry impacts on the environment

By Hannah Mason, AVS President (4th Year, Bristol)

With ‘Vegan-uary’ being some celebrity’s New Year’s resolution and meat-free Monday campaigns gaining thousands of likes on Facebook, it is clear that eating less meat has become much more common. This is especially true of our generation – now a predicted 12 per cent of the UK population is vegetarian, as are 20 per cent of 16 to 24 year olds. In a profession such as ours, which is inextricably linked to the meat industry, what does this mean for us?

As a society, we eat meat safe in the knowledge that animals live in the present day and do not understand the concept that in several weeks they may be on someone’s dinner table. Although people have been eating meat for many years, what has caused the recent rise in vegetarianism?

There have been several reports recently regarding the impact of the livestock industry on the environment. It was recently announced that 2015 was the hottest year on record and it is predicted that this century will give us a four or five degree increase in temperature. This has potentially devastating effects, and not just on polar bears.

Last year in India 2500 people died due to extreme heatwaves. The floods that affected the North of England over Christmas have also been attributed to the effects of climate change. A recently published report blamed the livestock industry and their by-products for 51 per cent of all global greenhouse gas emissions – dwarfing the 13 per cent attributed to the entire transport sector.

Livestock currently cover around 45 per cent of the earth’s total landmass – with animal agriculture leading to 91 per cent of Amazon destruction. With total meat demand expected to rise to 327 million tonnes in 2020, it is easy to see intensive farming being a normality driven by sheer lack of space. This has traditionally been associated with lower welfare conditions for animals and a higher risk of disease, and with antibiotic resistance being another global threat, is this really something we can afford to promote?

In terms of the meat industry providing food and sustenance to people, it actually represents a staggeringly inefficient use of resources – meat and dairy products contain only 2.6 per cent of the feed and pasture biomass fed to them. While the Western world may eat a variety of meats, there are still over a billion people in the world who live without sufficient food and clean water. The amount of water taken to produce one beefburger is equivalent to two months’ worth of showers. It seems ludicrous that we, technically, have enough resources on this planet to provide for everyone – yet much of it is wasted – literally as shit. One statistic that really struck me was that, if global meat consumption dropped by 50 per cent, the number of malnourished children in developing countries would decline by 3.6 million children in 2020.

There are recognised health benefits to eating meat, when prepared properly. It provides essential amino acids that we need (which many plant-based proteins lack). Meat, however, has also been linked to an increase in the incidence of colorectal cancers, among other health concerns. Processed meat was recently classified as a group 1 carcinogen by the World Health Organization – the same category as tobacco smoking and asbestos. This, however, does not mean that a meat diet is necessarily unhealthy, more that moderation is key. It is also worth noting that individuals on plant based diets tend to have a significantly lower body mass index and a lower risk of cardiovascular disease – up to a 20 per cent decrease was observed in some studies. With coronary heart disease being the biggest cause of death in the UK, and a massive drain on NHS resources, surely eating less meat wouldn’t be a bad thing.

For many reasons, it seems impossible to argue that the rise in vegetarianism is anything but a good thing. Morally, it seems everyone has a duty to advocate eating less meat for the sustainability of our planet. However, how does this work for us, as future vets, when our chosen vocation is so closely intertwined with the livestock industry?

With sessions discussing these issues at BVA congress, and an article on the subject by former BVA president, John Blackwell, it is clearly a topic that needs more debate. John’s conclusion was that the role of the vet should be to ensure that the UK is seen to be the pinnacle of quality meat production – with no increase in quantity. By increasing the health of our animals, we can get strip out the inefficiencies in the production process and get them to slaughter quicker – reducing their environmental impact. The FAO recently published a report that said it was possible to cut greenhouse gas emissions from livestock by 30 per cent from making improvements in existing production systems. This could be achieved
by adopting best practice in feeding, health and husbandry and manure management. In particular, better quality of feed, improved breeding and heard health.

Globally, the farming industry needs to change. China has announced the opening of a facility where one million cows will be cloned every year – is this the future of the farming industry? (Cloning farmed animals is banned in the EU due to welfare concerns.)

In a case put forward by Mark Fairisle, in his book ‘Meat: A Benign Extravagance’, he argues that the problems lie not with the eating of meat, but the current farming model. He suggests that if we stopped feeding food that we could eat to animals, we could still produce half of the current global meat supply. He suggests cows should eat grass, which they are efficient at converting. However, finding enough space for that many cows I fear may be a concern.

He also questions the feeding of swill to pigs – a practice that has been banned in the UK since the foot-and-mouth disease outbreak of 2001. It is an interesting theory, the feeding of sterile, traceable swill currently happens in the USA and Korea. Although it is unlikely to happen in this country, it represents a critical point in the food chain where changes may be made.

Eating less meat is a good thing, for health reasons, and is a global benefit too. Many more people are adopting vegetarian lifestyles, although any reduction in meat consumption should be applauded. Vets have always been excellent educators. Now, more than ever, it is time to use our knowledge of the newest diseases, therapies and production techniques to ensure that the UK livestock industry becomes one of the most sustainable in the world.

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**The Wight path for the future**

*By Seth Kennard (3rd Year, RVC)*

**Is the veterinary profession better off leaving James Herriot behind?**

Meeting the extended family at Christmas is one of those times, when you make small talk with people you haven’t seen in months and rarely discuss ‘proper’ subjects like politics, economics or the impending population crash. Instead the conversation often hinges around how much they are enjoying (or not) their new job (with a job description that I don’t understand) and how much I am enjoying my course.

Invariably, the subject of James Herriot comes up and, recently, after agreeing with my aunt about how funny his books are and how wisely he resolved problems, she then moved into a different realm of the conversation about how she took one of her greyhounds to the vet and he did something very different to what good old James would have done. Somewhere between the Internet and the Herriot books, she had decided that she could diagnose her dogs better than a qualified professional.

The Herriot books make a lovely read, but watching The Imitation Game didn’t make me qualified to fix my computer. The world of James Herriot has, for better or worse, passed. There are no longer more dairy farms in each postcode than fingers to count with, no more mixing potions to shove down cows’ throats and certainly no more male-only vet practices.

Those days have changed, and some people haven’t noticed the work the profession does now. It doesn’t yet realise the role we play in public health, policymaking and the vital part we play in agricultural business and planning by looking at things at a herd health level.

Many members of the public, won’t let go of the image of a vet shoving their arm up a cow’s bottom. There seems to be a chronic misunderstanding of the modern vets’ role in society, and certainly a modern vets’ training. How many times have you been asked ‘it’s seven years to train as a vet isn’t it?’ Or ‘do you have to learn about all the animals then?’ (The best reply I’ve had to answering that question was: ‘well, all the animals are quite similar aren’t they?’).

It’s about time as a profession that we let the past go and move on – showing ourselves as a forward-thinking, wide-reaching and highly trained profession.

The veterinary profession is trusted and respected, even if it is misunderstood. According to the Vet Futures report, 94 per cent of the population trusts vets partly or completely – that’s more than GPs, dentists and head teachers, and that must be due, in part, to Alf Wight (the real James Herriot).

The books, and later the TV series, gave people a glimpse into the science and art of being a vet, letting people see how hard it can be sometimes. Although it can be outdated or unrealistic at times (I mean, where’s the five-minute hand washing scene), the fundamental skills of communication, empathy and a good firm handshake haven’t changed a bit in all those years, and I hope they never do.
Injuries in vet life

By Seamus McSorley, Junio Rep (3rd Year, Liverpool)

At the beginning of my first term this year, I managed to tear my anterior cruciate ligament (ACL) and rupture my medial meniscus, while playing for the vet rugby team.

One week before the first of our January exams, I went under the knife to have the cruciate reconstruction and the medial meniscus removed. The operation went well and in the weeks after surgery, I thought a lot about the things we put ourselves through inside and outside of the vet school, and the dangers of the profession.

I decided to do a bit of research, so I started with my team mates and ‘victims’ of vet rugby. Their injuries included a dislocated knee, broken patella, a few other ACL injuries and even a broken neck. Then I moved onto the casualties of rotations and EMS. These comprised broken toes from horses and cattle stamps, broken fingers, a few accidental injections (atropine and heptovac), iodine burns and many more war wounds on the farm.

One specific student has accumulated more injuries than most in their time at vet school. Her injuries include a broken foot with dislocated toe; being knocked out by a lamppost, a cracked bone in the knee with subsequent deep vein thrombosis; a fractured skull and two neck vertebrae; a severe brachial plexus injury with severed radial nerve, a dislocated shoulder; compartment syndrome, a dislocated thumb and ruptured ulnar collateral ligament, five smashed ribs, a punctured lung, another broken foot, a blown disk in neck followed by serious infection from a bee sting, a sliced open hand and finally a ruptured spleen.

According to a recent survey carried out by the British Equine Veterinary Association, equine vets have the highest injury risk of all civilian professions, with the additional expectation that an equine vet will experience between seven or eight work-limiting injuries during a 30-year career. All practices are required to provide workers with compensation if an employee is injured in a work-related accident. This includes paid leave and relevant medical costs, which should be covered by practice insurance.

Until now I had never fully appreciated how physically demanding the job of a veterinary surgeon is. I have taken for granted simple things that in my current condition I would not be able to do. For example, an equine clinical exam, a caesarean section on a cow or even bend down to pick up a small puppy for a vaccination. And I sure as hell couldn’t stand through a four-hour surgery. Most people will recover fully and are able to be fit fully functional vets, but for those that don’t, we could agree with the recently retired champion Jockey A. P. McCoy: ‘I know from sitting around with injuries how difficult life will be without racing and riding winners’. Of course, there are veterinary jobs that are less physically demanding. And, luckily for those who do get injured in our line of work, it is great to know there are other things we can do using our veterinary degree that do not involve such physical activity even if it isn’t our first choice of application.

AVS Sports Weekend 2015

By Ellie Drabble, Junior Rep (4th Year, Cambridge)

The infamous national veterinary student reunion that is ‘Sports Weekend’ was hosted by Bristol vet school last year and lived up to its reputation. The weekend consisted of intense sporting competition with a drink or two along the way, and culminated in hundreds of vet students struggling through their respective Sundays.

The Bristol committee rose to the challenge, meeting the high standards set in previous years and delivering a memorable weekend. As always, the Friday began with the (particularly long for some) coach journey to Bristol, while the AVS Facebook page received entertain-
ing updates throughout the day and people grappled with their new-found fame.

With fewer travel traumas occurring than last year in the various attempts to successfully cross the Irish Sea, Friday night began at the Union bar before heading onto the first nightclub of the weekend. This is where the fancy dress really came into its own; Glasgow came as Mario, Dublin as cowboys, Surrey as Mexicans and the RVC stayed true to its name and dared to show off their crown jewels. Cambridge came as Toy Story Aliens, Edinburgh were firefighters and so quite rightly spent a lot of the time at the bar with the liquid. Liverpool donned Incredibles outfits, Nottingham were bees and our fabulous hosts were Oompa Loompas.

It was a fun night enjoyed by all, especially by Cambridge students who got to experience a club that doesn’t solely play the Circle of Life or Titanic theme tunes. The night apparently featured dance-offs (my skills were not required here) and also saw great comradeship as kind Oompa Loompas face-painted and donated wigs to the clever Cambridge students who had lost their ID the night before.

The next morning the general public was once again treated to sights of extreme fancy dress. The serious part of the weekend had descended however, and vet students from across the country got their game faces on. Bristol increased the variety of sports this year and the matches were fuelled by that competitive nature which earns you your place at vet school. Liverpool mourned the loss of the Sports Weekend trophy to Bristol after smugly enjoying their winning streak, while Cambridge was happy to have hit double figures in their representation meaning they could actually form a sports team. The ceilidh was, as ever, greatly enjoyed and participated in by all universities, and though the steps delivered might not have quite been what the professionals had suggested, it by no means dampened any spirits!

As sports and dancing drew to a close, the pub-crawl through Bristol began. Many pubs, knowingly or not, played host to hundreds of students as we made our way closer to the club that night that would show us the true edge of Bristol. More friends were made as people challenged each other to boat races, joined house parties, or even halfway through the crawl decided to have a sit down meal in Wagamama’s with the surrounding families. By the end of the evening, Dublin, born out of the land of Guinness, had once again won the game of last-man-standing.

Sunday was sadly the day to head home and for some this was a painful journey. However, the promise of Sports Weekend 2016 and the prospect of a reunion at AVS Congress in Liverpool in February saw many through. The weekend was fantastic and big thanks must go to Bristol for their organisation and hard work; you did a stellar job!

If you have ever considered going to Sports Weekend then think no further – get a ticket at the earliest opportunity! It is one of the highlights in the veterinary calendar and allows you to meet your future colleagues, many of whom will become good friends. It’s also a chance to blow off some steam and make countless fun memories and stories. The countdown to London 2016 begins.
In November 2015, I decided I needed a break from the misery of English weather. After finding Spay Panama in the BVA Overseas Contacts List, I headed to Central America to spend two weeks volunteering with this non-governmental organisation.

What struck me first about Panama was the humidity. The second thing was how friendly the people were. I was greeted at the airport with a kiss on the cheek and driven to Spay Panama’s centre.

During the first week, I stayed at the centre and helped with pre- and postoperative routines. This included using a tattoo gun to mark an ’S’ on dog’s ears so that they don’t end up being brought in twice to be spayed; cats had a little slice of pinna removed for the same purpose. Every time I splashed a bit of tattoo ink on my hand I had visions of permanently tattooed dots on my hands and laser removals costing thousands of pounds… Of course it never came to that, and by the fifth dog I was marking my Ss with artistic flare.

Lunch was a great way to learn about real Panamanian food, with plantain and corn being cooked in a new way every day. By the end of my trip, rice and peas had almost become a way of life for me, as did communicating in Spanglish. Turning up with about two phrases in Spanish wasn’t entirely helpful, but little by little I got to grips with basic Spanish.

The second week was a spay trip, which involves gathering together as many volunteers and equipment as can fit on the mobile sterilisation bus, and travelling through different communities in the Panama countryside.

We would typically spend two days and two nights in each community doing a mass spay event where people could come to get their cat or dog neutered. These spay events are held in schools, community centres, and basketball courts.

The service was not free, a donation was required for the neutering. However, many of these communities were poor, so not all donations are monetary. Many people brought food as a donation, which explained the small mountain of plantain I came across on the first day (I had just assumed someone was really craving plantain that day). By ensuring that everyone makes
ovariohysterectomies use the quick spay method, which is taught to veterinary surgeons who volunteer with Spay Panama.

It was a very interesting trip in that it really made me consider in detail the pros and cons of early neutering. I concluded that it is easy to worry about the negative consequences of early neutering when we don’t see tick-ridden emaciated stray animals wandering our streets.

The youngest animal I neutered was a three-week-old kitten, and I honestly had no qualms in castrating him as it could be a year before Spay Panama returned to that area. How many kittens of his own could he have sired in a year? How would they find homes? Who would feed them?

Although volunteering with Spay Panama involved a lot of hard work, it also involved a lot of fun, laughter, and camaraderie. I made some amazing new friends, had dinner overlooking the Panama Canal, got sunburnt wandering along the Cinta Costera, and cuddled a lot of cats. It was an unforgettable trip, and I hope to return to Panama again to volunteer.

Spay Panama was founded 14 years ago and is run by Patricia Chan. While I was there, the organisation hit a landmark figure – the 100,000th animal to be neutered.
Above: a sample image taken from the project. Two T cells interact with an antigen-presenting cell (APC) which initiates signalling cascades within the T cell. The concentration of the protein of interest is detected by a computer, which generates an identical image underneath using colours to represent concentration. Light colours i.e. white, yellow and red indicate a high concentration of the protein; darker colours i.e. purple and blue represent a low concentration of the protein. The APC has none of the protein whatsoever, so comes out black like the background. In this project, the protein of interest did not consistently localise with enough statistical significance in any one specific place within the T cells. This served as a reminder that research does not always go to plan. Regardless, the experience can still be richly rewarding.

Time, space and immunology

By Matt Dickinson, new graduate Bristol

Imagine your parents, whose meeting was (generally) essential for your existence. Now imagine they were born 1000 years apart. Suddenly your existence is impossible; your parents were separated by time. Alternatively, imagine they were born at the same time, but 1000 miles apart, never meeting. Again, you no longer exist; your parents were separated by physical space. Your parents are intracellular proteins. You are another unique protein that is produced when they meet, and Earth is a white blood cell (leukocyte). Allow me to elaborate.

Every medical, veterinary or biomedical undergraduate is begrudgingly acquainted with signalling cascades. These notoriously complex chains of events underly the way organ systems function in health and disease. One protein in a cell meets another; producing a different protein until we see a functional consequence. In immunology, this might be a leukocyte engulfing a bacterial invader or producing antibodies against a virus.

There is a problem with this dogma, however. What if two key proteins never meet within a cell, each in the wrong place, or the wrong time, or both? Much like in our parent-child-earth metaphor, the product then is not created. This might change the end function, making a leukocyte behave completely differently. This concept underpinned my research project as a veterinary student intercalating in an immunology degree.

My project entailed studying one protein in T cells (a type of leukocyte) in intracellular space and time. The laboratory would later apply the work to specific diseases such as multiple sclerosis and some cancers. What if the intracellular time-space organisation of T cell proteins affects how diseases progress, or how they start in the first place? Imagination is the only limitation. My wonderfully eccentric supervisor and I regularly discussed these implications. He had studied over 50 T cell proteins and his contagious enthusiasm never failed to grab my attention.

The project was not without challenges. Working with invisible DNA or cells in unfathomably miniscule volumes of liquid demands patience, much like delicate veterinary surgery. Often a fortnight of diligent toil yielded nothing but silent mockery from a Petri dish of dead cells. However, the highs were very rewarding. After three months my genetically-engineered cells lay under a huge microscope. I gently leaned on the desk, causing microscopic vibrations. The on-screen cells suffered an earthquake, scattering in all directions like soap bubbles in a stiff breeze. Suddenly this abstract, microscopic world I had read about (yet never really observed) became tangible and real. At that moment science came alive for me.

My results were underwhelming and lacked statistical significance, but the images generated were fascinating. I began university wanting to be a vet, but by the time I graduated, my brief brush with research sparked something in me that I never knew was there. I am now certain I will pursue a career in research, and I owe it all to a chance encounter with an inspirational supervisor and a brilliant project. I guess I was just in the right place, at the right time.
Another obligatory personal tutor meeting, and yet again little to discuss. The result? Talking about my non-existent summer holiday plans, to which my tutor’s response was ‘well you should certainly try some research’. With virtually no lab experience and no funding, I was very doubtful about my chances.

However, soon enough, I managed to get involved in a project which was on the hunt for the genetic mutation that causes congenital cataracts in miniature schnauzers. Having tried to explain this to my family (who have now decided DNA stands for Do Not Ask) I packed up and went off to the Animal Health Trust in Newmarket to start my adventure.

Congenital cataracts is a source of contention in miniature schnauzer breeding circles, so developing a DNA test is a priority. The search started by comparing the genome of a miniature schnauzer with congenital cataracts to genomes of other breeds of dog without the condition. The result, hundreds of thousands of differences! A complex computer programme was used to filter the results down to a much more manageable list of possible problem genes — in the hundreds rather than thousands. The next move was to look closely at these genes; for example, to see if they actually had anything to do with the eye, or whether they were highly conserved across mammalian species (essentially, if this gene went wrong could it cause cataracts?). This whittled the list down again leaving just a few candidate genes. We eventually selected one gene that seemed the most likely candidate.

The next stage was to test it. This relied on having lots of DNA samples from a variety of dogs. The way the DNA is obtained from a dog is through a swab which is brushed on the inside of the dog’s cheek (easier in, say, a golden retriever than perhaps a pug). Cheek swabbing is a fairly inexact science and tends to have a variety of things on them, from the dog biscuit the owner used to incite the dog to allow them to be swabbed, to the millions of bacteria found in dog’s mouths. Hopefully, however, there are a few cheek cells there as well, and this is where the dog DNA is extracted and purified.

We had numerous samples from miniature schnauzers with and without the disease. These samples were all tested, looking at the mutation in that candidate gene we had identified. Ideally, if the right gene has been identified then all the affected miniature schnauzers will exhibit the same change, and all those not affected won’t.

In my case the results were only marginally statistically significant, not the golden mutation find we were hoping for. I have now seen how research doesn’t always go to plan with samples evaporating, DNA swabs only containing dog biscuit and not finding the right mutation. But I thoroughly enjoyed the experience, learnt a huge amount and have developed what I hope will be a lifelong interest in genetics.
**Hippopotamus amphibious**

exhibits of one of nature’s greatest feats

By Amrita Mann (3rd Year, RVC)

Although the *Hippopotamus amphibious* is known for being one of the most dangerous and ferocious animals in the animal kingdom, these magnificent animals possess one of nature’s best-kept secrets. As a junior zoo keeper at the Ragunan Zoo, in Jakarta, Indonesia, I was fortunate enough to witness this amazing phenomenon. As I stood in the tropical sunshine with the hippopotamuses, I noticed droplets of sweat beginning to form on their backs and faces as they ate. A few minutes later, these droplets of sweat turned into larger trickles of dark pink and red down their flanks and cheeks. Stunned by this strange colour, I turned to the zoo keeper and he simply replied, ‘blood-sweat’. As my curiosity grew, I wanted to research this fascinating secretion.

There is a very limited amount of research on these pigmented secretions. However, Saikawa and others (2004) found that these secretions are neither blood nor sweat, but are multifaceted secretions with antimicrobial, insect repellent, coolant, sunblock and sunscreen properties. This makes them intrinsic to the well-being of the hippopotamuses and valuable for human research and use. A relatively new and emerging field of biomimicry applies these useful properties and substances found in nature to innovative products, designs and systems for human use. A multifaceted substance such as these pigmented secretions is extremely desirable for biomimicry researchers who wish to adapt these properties for multipurpose products for humans.

Although these secretions are multifaceted, the sunblock and sunscreen efficacy is of particular significance since 95 per cent of the harmful ultraviolet rays that reach the earth’s surface are ultraviolet A (UVA) wavelengths (315 nm – 400 nm) (Badger Balm, UVA sunscreen). UVA rays are particularly harmful with longer exposure as they penetrate the skin and can cause cancer and premature aging (Helmenstein).

Although one might think that hippopotamuses have thick skin, their skin can still be prone to damage from UVA rays. Hippopotamuses are nocturnal and eat large volumes of low quality forage at night, thus living a sedentary lifestyle during the day with parts of their skin above the surface of the water and exposed to the sun. The constant exposure to the sun’s ultraviolet rays on their hairless bodies suggests that hippopotamuses must have a protective mechanism to reduce the harmful effects of this exposure on their skin (Kettlewell).

Saikawa and others (2004) found that this pigmented crystalline secretion contains two main compounds recently named as hipposudoric acid and horhipposudoric acid. Both these pigments exhibited sunscreen and sunblock properties and absorbed light in the ultraviolet spectrum and they concluded that, “[the secretions] physical properties should satisfy the least requirement as a sunscreen’. In fact, between the two compounds (one behaving as a sunscreen and the other as a sunblock), they have a cumulative protective effect on the animal from the sun’s harmful ultraviolet rays (Reed 2009).

Given that research on this topic is uncommon, I was determined to investigate the efficacy of the pigmented bodily hippopotamus amphibious secretions as a sunblock and sunscreen against UVA wavelengths of light. A total of 60 samples of the pigmented secretion were
collected from three hippopotamuses and were placed in cuvettes for spectrophotometry. Wavelengths from 345 nm to 400 nm (in 5 nm increments) were passed through the cuvette and a percent transmission was recorded to assess the sunblock and sunscreen efficacy of the secretions. The results supported my hypothesis and previous research as it showed that as the wavelength of light increased from 345 nm to 400 nm, the percent transmission of the secretions decreased (strong negative correlation). In fact, the percent transmission at all measured wavelengths was less than 30 per cent, which highlights the pigments’ ability to absorb the majority of the harmful ultraviolet A rays.

Furthermore, the polymerisation (compounds forming longer chains) of the sample increased the opacity of each sample (samples changing colour from colourless to brown), adding to the decreased percent transmissions and the intrinsic sunblock and sunscreen properties. However, the instability and thus polymerisation of the samples also produced a large variability in the results.

These findings are promising and further research is essential to investigate other properties and their mechanisms to apply these properties to future pharmaceutical products. Although it has been shown to be unstable for direct contact with human skin, Hashimoto believes that, ‘if chemists could make more stable derivatives, these pigments would be seeds of pharmaceutically important compounds’ (Milius 2009).

References


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