THE CANADIAN WOOL COUNCIL

CANADIAN WOOL STANDARD
A Roadmap Through Canada's Wool Industry

CANADIAN WOOL COUNCIL

CONTENT

PREFACE

Canadian Wool Standard (First Edition) is compiled by Jane Underhill for the Canadian Wool Council to serve as a roadmap through the Canadian sheep and wool industry. It is an appropriate reference tool for domestic and foreign consultation.

The Canadian Wool Council is a not-for-profit association representing the wool industry in Canada. Its aim is to improve consumer awareness and develop opportunities for Canadian wool.

CANADIAN WOOL COUNCIL

INTRODUCTION

Sheep breeds and their crosses are managed under a variety of farms systems depending on sheep type, topography, climate, and resources available to the producer. There are federal, provincial/territorial, and municipal regulations across the country that affect sheep farming. Producers must be aware of and abide by these regulations.

CANADA'S PROFILE

Canada's population is 40,509,917 habitants in 10 provinces and on 3 territories. Canada is the world's second-largest country with a landmass of 9,984,670 square kilometers. Canada spans 5,514 km from east to west with most of the population living within 500 km of the Canada – US border. Canada experiences four distinct seasons with variable temperature, rainfall and snowfall across the country.

INDUSTRY GOVERNANCE

Agriculture and Agri-Foods Canada agriculture.canada.ca
Agriculture and Agri-Food Canada supports the Canadian agriculture and agri-food sector through initiatives that promote innovation and competitiveness. They work in partnership with Canadian Food Inspection Agency and portfolio agencies.

Canadian Food Inspection Agency inspection.canada.ca
The Canadian Food Inspection Agency is dedicated to safeguarding food, animals, and plants, which enhances the health and well-being of Canada's people, environment, and economy.

Canadian Sheep Federation cansheep.ca
The Canadian Sheep Federation represents producers through its board of directors comprised of representatives from provincial sheep associations and Affiliate Members. Their mission is to further the viability, expansion, and prosperity of the Canadian sheep industry.

National Sheep Network nationalsheepnetwork.com
The National Sheep Network is comprised of Alberta Lamb Producers, Ontario Sheep Farmers and Les Éleveurs d'ovins du Québec. Together, these three provinces represent 75 percent of Canada's ewe flock and have joined together to leverage resources and producer leadership on issues of mutual interests.

Canadian Sheep Breeders Association sheepbreeders.ca
Canadian Sheep Breeders' Association is a national membership organization overseeing purebred sheep. The organization is governed by elected officers and directors working for the interests of breeders of registered purebred sheep in every province and territory.

Canadian Livestock Records Corporation clrc.ca
Canadian Livestock Records Corporation is a non-profit organization incorporated under the Animal Pedigree Act. CLRC offers a wide variety of services to its partner associations including administration of purebred registrations, parentage testing, research, customized reports and management of breed standards books.

Genovis genovis.ca
GenOvis is a genetic improvement program designed to assist purebred and commercial sheep farmers in the evaluation of breeding stock, and to provide a measure of the comparative productivity of ewes in flocks. The program provides information that farmers can use to improve the genetics of their flock and monitor performance.

Canadian Cooperative Wool Growers wool.ca
Canadian Co-operative Wool Growers is a co-op with 1,200 shareholders and six retail locations in Canada. It is the sole distributor of Canadian Sheep Identification Program (CSIP) RFID tags, and the largest buyer of wool in the country. The co-op grades and markets most of the wool in Canada, with the rest being marketed directly by the sheep farmers in a variety of forms including raw fleece, roving and yarns.

LEGISLATION

CODE OF PRACTICE FOR THE CARE AND HANDLING OF SHEEP
nfacc.ca/codes-of-practice/sheep

The Code of Practice for the Care and Handling of Sheep is a set of guidelines developed by the National Farm Animal Care Council (NFACC) in Canada to provide recommendations for the care and handling of sheep. The code was first released in 2013 and underwent a 5-year review that was completed in 2020. The code covers various aspects of sheep farming, including environmental conditions, facilities, feed and water, health management, husbandry practices, transportation, and euthanasia.

ANIMAL PEDIGREE ACT
laws-lois.justice.gc.ca/eng/acts/A-11.2/

The Animal Pedigree Act is a federal statute that provides the legal framework for the establishment of breed associations (animal pedigree associations) in Canada. The Act is administered by Agriculture and Agri-Food Canada through the office of the Animal Registration Officer. The Act aims to support breed improvement and protect individuals who raise and purchase animals.

HEALTH OF ANIMALS REGULATIONS (
laws-lois.justice.gc.ca/PDF/C.R.C.,_c._296.pdf

The Health of Animals Regulations are a set of regulations under the Health of Animals Act that aim to protect animals and animal health. They provide for the control of diseases and toxic substances that may affect terrestrial and aquatic animals or that may be transmitted by animals to persons. These regulations cover a wide range of topics, including the segregation and inspection of animals, importation of germplasm and animals, importation of animal products, eradication and control of diseases, transport of animals, and more.

TRACEABILITY AND RECORD KEEPING

CANADIAN SHEEP IDENTIFICATION PROGRAM (CSIP)

The Canadian Sheep Identification Program (CSIP) is a mandatory national identification system administered by the Canadian Sheep Federation (CSF). The program is designed to address producer concerns about sheep health and meet consumer expectations for quality assurance and food safety. The yellow Allflex button sheep tag and the yellow Shearwell data tag are the only Radio Frequency Identification (RFID) tags currently approved for use in the Canadian Sheep Identification Program (CSIP).

CANADIAN VERIFIED SHEEP PROGRAM (CVSP)

The Canadian Verified Sheep Program is an optional on-farm program created for any Canadian sheep or lamb producers to address potential food safety challenges, and to improve animal welfare and biosecurity. The program examines all areas of production and outlines good production practices that are designed to minimize food safety risks.

BREED PROFILE (as of 2023)

OVERVIEW

Canadian Sheep Breeders Association (CSBA) governs Canada's purebred sheep industry. Canada's purebred sheep registry is maintained by Canadian Livestock Records Corporation (CLRC). Whenever possible, data for this breed profile was compiled from the breed standards published by CSBA. Missing wool data was supplemented using The Field Guide to Fleece: 100 Sheep Breeds & How to Use Their Fibers by Carol Ekarius and Deborah Robson as a baseline reference.

Much of the Canadian flock is made up of commercial crossbreeds. Most crosses are derived from the pure breeds listed here although there are some examples of breeds not listed here. There are also breed grade ups in progress.

CANADA'S SHEEP PROFILE

- 50 recognized purebred sheep breeds (2023)
- 43 registered breeds on the ground (2023)
- 8 sheep breeds dominate in breeding programs accounting for 74% the Canadian flock.
- 854,400 head (2023)
- 8,487 sheep farms (2021)
- 22,969 exported head of sheep valued at $1.8 million (2021)
- 16,169 imported head of sheep valued at $3.0 million (2021)
- 71% of sheep are raised in Ontario, Quebec, and Alberta
- National flock is meat production focused however dual- and tri-purpose breeds are common.
- Between 95 and 150 shearers, part-time, full-time, and seasonally.

SHEEP POPULATION PER PROVINCE

*as of January 1, 2023**

Province	Headcount as of January 1, 2023
Newfoundland and Labrador	3,100
Prince Edward Island	10,000
Nova Scotia	15,100
New Brunswick	5,900
Quebec	176,100
Ontario	274,000
Manitoba	79,100
Saskatchewan	80,500
Alberta	171,500
British Columbia	39,200

**Statistics Canada. Table 32-10-0129-01 Number of sheep and lambs on farms (x 1,000)*

MOST PROMINENT BREEDS

Most Prominent Breeds (in order of population domain)	Pop. %	Origin	Type	Wool Description	Micron (µ)	Average Staple Length		Average Fleece Weight	
						in	cm	lb.	kg
Dorset, Polled	19.8%	AU/US	Meat breed	Bright white, dense	26-33 µ	2.5 - 5 in	6 - 13 cm	4.5 - 9 lb	2 - 4 kg
Suffolk	18.3%	GB	Downs breed	Medium, dense, resilient	25-33 µ	2 - 3.5 in	5 - 9 cm	4 - 8 lb	1.75 - 3.75 kg
Arcott, Rideau	13.3%	CAN	Tri purpose	Variable	25-33 µ	2.5 - 3.5 in	10 -13cm	4.5 - 5.5 lb	2 kg - 2.4 kg
Romanov	10.3%	RUS	Hair breed	Coarse, black fibres		4 - 5 in	10 - 13 cm	6 - 13 lb	2.75 - 6 kg
North Country Cheviot	4.6%	GB	Dual purpose	Pure, white, lofty, strong, and chalky	27-33 µ	3.5 - 6 in	9 - 15 cm	5 - 10 lb	2.25 - 4.5 kg
Hampshire	4.0%	GB	Downs breed	Medium-strong, matte	24-33 µ	2 - 4 in	5 - 10 cm	4.5 - 10 lb	2 - 4.5 kg
Texel	2.2%	NL	Meat breed	Medium, coarse, bulky	26-36 µ	3 - 6 in	8 - 15 cm	7 - 12 lb	3.25 - 5.5 kg
Southdown	1.5%	GB	Downs breed	Fine to medium, dense, chalky	23-31 µ	1.5 - 4 in	4 - 10 cm	4 - 8 lb	1.75 - 3.75 kg

BREEDS UNDER 26 MICRONS

Breeds	Origin	Type	Wool Description	Micron (µ)
Charollais	FR	Meat breed	Medium-fine, dense (Friendly wool)	25 µ
Icelandic**	IS	North Atlantic	Dual coated	25 µ
Merino*	SP	Wool breed	Fine, thick, bulky	23 µ
Polypay	US	Dual purpose	Fine, soft,	25.5 µ
Rambouillet	FR	Wool breed	Fine, even, bouncy, fairly chalky, matte	21 µ
Rouge de l'Ouest*	FR	Meat breed	Dense, fine	24.5 µ
Targhee	US	Dual pupose	Fine, bright, matte	24.5 µ

BREEDS - 26 - 30 MICRONS

Breeds	Origin	Type	Wool Description	Micron (µ)
Arcott, Canadian	CAN	Tri purpose	Soft, lustrous	29 µ
Arcott, Outaouais	CAN	Tri purpose	Variable	29 µ
Arcott, Rideau	CAN	Tri purpose	Variable	29 µ
Bluefaced Leicester	GB	Wool breed	Fine, semi lustrous	26 µ
British Milk Sheep	GB	Milk breed	Medium-strong, semi-lustrous (Friendly wool)	29.5 µ
Clun Forest	GB	Downs breed	Medium, dense	29 µ
Columbia	US	Dual purpose	Medium, heavy	27 µ
Corriedale	NZ	Dual purpose	Bright, soft	29 µ
Finnsheep	FI	Dual purpose	Soft, lustrous	27.5 µ
Hampshire	GB	Downs breed	Medium-strong, matte	28.5 µ
Ile de France	FR	Dual purpose	Medium-fine (Friendly wool)	26.5 µ
Jacob	EN/SP	Dual purpose	Medium-strong, multi coloured	30 µ
Karakul	US/ UZB	Carpet variety	Strong, coloured, hair-like	30.5 µ
Montadale*	US	Dual pupose	Long staple relatively soft	29.5 µ
Ryeland*	GB	Meat breed	Medium, springy, chalky, coloured	28.5 µ
Shetland	GB	North Atlantic	Varies - very fine to coarse, coloured	30 µ
Shropshire	GB	Downs breed	Medium, boucy, elastic, sticky, less matte for a down variety	28.5 µ
Southdown	GB	Downs breed	Fine to medium, dense, chalky	27 µ
Suffolk	GB	Downs breed	Medium, dense, resilient	29 µ

BREEDS OVER 30 MICRONS

Breeds	Origin	Type	Wool Description	Micron (µ)
Berrichon du Cher	FR	Dual purpose	Semi fine, white	31 µ
Blackface (Scottish)	GB	Mountain breed	Strong, long staple	34 µ
Border Cheviot	GB	Downs breed	Long, strong, matte	30.5 µ
Border Leicester	GB	Wool breed	Long, strong lustrous	34.25 µ
British Milk Sheep	GB	Milk breed	Medium-strong, semi-lustrous (Friendly wool)	29.5 µ
Coopworth	NZ	Dual purpose	Medium	34.5 µ
Cotswold	GB	Wool breed	Long, lustrous and silvery	37.5 µ
English Leicester	GB	Wool breed	Dense, lustrous	39 µ
Lincoln	GB	Wool breed	Strong, lustrous	39.25 µ

ANIMAL WELFARE

FIVE FREEDOMS

IWTO Specifications for Wool Sheep Welfare
The International Wool Textile Organization aligns their Wool Sheep Welfare standards with the Terrestrial Animal Health Code (TAHC). The TAHC is a set of standards developed by the World Organization for Animal Health that aims to improve animal health and welfare. The standards are described as the Five Freedoms.

1. Freedom from hunger, thirst, and malnutrition – through ready access to fresh water and a diet sufficient to maintain full health and vigour.
2. Freedom from discomfort – through provision of an appropriately sheltered and comfortable environment.
3. Freedom from pain, injury, and disease – by prevention or rapid diagnosis and treatment.
4. Freedom to express normal patterns of behaviour – through provision of sufficient space, suitable facilities, and company of the animal's own kind.
5. Freedom from fear and distress – ensuring conditions and treatments imposed avoid mental suffering.

For more information on the Terrestrial Animal Health Code developed by the World Organization for Animal Health visit: https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/

CODE OF PRACTICE FOR THE CARE AND HANDLING OF SHEEP

The Code of Practice for the Care and Handling of Sheep, developed by the National Farm Animal Care Council (NFACC), forms the backbone of the Animal Welfare component of this document. The Sheep Code of Practice aligns with global standards developed by the Terrestrial Animal Health Code developed by the World Organization for Animal Health.

To consult the full Sheep Code of Practice visit www.nfacc.ca/sheep-code

ENVIRONMENTAL CONDITIONS

Producers must:

- Promptly assist individual sheep displaying signs of heat or cold stress.
- Monitor sheep entering the flock that come from a different environment or production system during the acclimation period and take action to help promote their health and welfare as required.
- Develop a contingency plan for extreme and sudden changes to weather conditions and be prepared to put the plan into action within hours. Be prepared to relocate the sheep, giving priority for shelter to the most vulnerable.

High Temperature, and Humidity, and Provision of Shade
Producers must plan for elevated heat conditions and take steps to mitigate heat stress by:

- Monitoring frequently for individual animals showing signs of heat stress
- Providing shade
- Ensuring adequate access to clean, fresh drinking water (demands for water will increase during hot weather

- Avoiding the handling and moving of sheep during the heat of the day
- Allowing sheep to rest during the heat of the day.
- Selecting an appropriate shearing season.

Provision of Shelter during Cold and Windy, and Cold and Wet Conditions
- Sheep must have access to shelter, either natural or man-made, that provides appropriate relief for the regional and seasonal climatic conditions and is appropriate for the individual production system.
- Producers must plan the lambing period for the available shelter and to match local climatic conditions.
- Producers must plan for extreme weather events and winter management.

Facilities

Housing and Handling for all Sheep
- Barriers, pen dividers, other penning or handling structures, must be suitable for sheep and maintained and cleaned to minimize potential illness and injury.
- All applicable equipment and services including water bowls and troughs, ventilating fans, heating and lighting units, milking machines, fire extinguishers and alarm systems must be inspected and cleaned regularly and kept in good working order.
- Feeding equipment must be suitable and safe for the type of sheep.
- Sheep must not be housed on solid concrete floors without providing adequate bedding.

For sheep handling:

- Producers and stockpeople must have access to equipment for safe handling, treatment, restraint, segregation, loading and unloading of sheep.
- Handling area must have surfaces that provide good traction.
- Handling systems must be designed to utilize natural sheep behaviour and managed to minimize unnecessary noise. (Refer to Section 5.1 Handling, Grouping and Moving Animals).
- Equipment must be maintained in good repair.

In housing, grazing and loafing areas:

- There must be sufficient space for all animals to simultaneously lie down and ruminate, stand up, turn around, adopt resting postures and move around easily.
- Producers must be able to make provisions for a hospital pen/area when required.
- All sheep must have access to a well-drained lying area. Constantly standing in mud is not acceptable.
- Housed sheep must have access to a dry lying area.

TEMPERATURE, HUMIDITY AND AIR QUALITY

- Indoor air quality and temperature must be maintained at levels to promote good health and welfare of sheep.
- When ammonia concentrations at sheep level exceed 25ppm, take immediate action.
- Producers must consider prevailing winds when constructing shelter for sheep to ensure adequate airflow and protection from cold winds.

Social Environment and Enrichment
- Sheep must have visual contact with other sheep.

Lighting
- Sheep housed indoors must be exposed to a natural daylight cycle (using either artificial or natural light), except for breeding animals under a controlled light regime.
- Lighting must be sufficient to allow appropriate care and inspection by stock people.

Bedding and Manure Management

- Bedding must be provided in all buildings used for rearing sheep, except for systems using slotted floors.
- Bedding must be clean and dry.
- Sheep must not be housed on solid concrete floors without providing adequate bedding.
- When lambing inside in cold temperatures, extra bedding must be provided.
- Where waste is stored, it must be stored in a manner to avoid run off getting into sheep housing areas, water sources, or feed and bedding supplies; or attracting scavengers to the housing area.

FEED AND WATER

Nutrition and Feed Management

- Ensure sheep have sufficient access to feed (including salt and minerals) of adequate quality and quantity to maintain them in good health, fulfill their nutritional and physiological needs and promote a positive state of well-being and vigour. The quality and quantity of feed required will depend on factors such as: age, frame size and body condition, reproductive status, health status, level of production, competition, and weather.
- Where salt and mineral are supplemented, it must be formulated specifically for sheep and suited to the geographical region.
- Except for feedlot lambs, sheep must have access to forage.
- All sheep kept in confinement must be inspected at least once a day to ensure the availability of feed and water.
- Monitor animal performance, behaviour, body condition score and health on an ongoing basis and adjust the feeding program accordingly if the average body condition score of the flock falls below the target for the stage of production (refer to Table 3.1) seek the help of a nutritionist or veterinarian if required.
- Take corrective action when the body condition score for individual sheep with a score of less than 2 out of 5 for meat breeds and 1.5 out of 5 for dairy/prolific breeds of sheep.
- Producers must provide alternative feed for winter-grazing sheep that no longer have easy access to forages due to heavy or crusted snow or severe weather conditions.
- Particular attention must be paid when feeding a high energy diet to prevent health problems such as grain overload, bloat, or other diseases. Diet changes must be made gradually.
- Take all reasonable steps to prevent exposure of sheep to toxins and to feed with physical qualities that could cause injury or limit intake.

Artificial Rearing

- Newborn lambs that are taken from their dams must receive colostrum within six hours of birth.
- Milk replacer used must be formulated for lambs.
- Artificially reared lambs must receive a volume and quality of milk replacer to promote health, growth, and vigour.
- Prior to being weaned, lambs must be consuming adequate amounts of clean water and solid feed daily to ensure health, growth, and vigour.

Water

- Sheep must have daily access to a source that provides sufficient clean and palatable water to satisfy their water intake needs.
- Watering systems must be suitable for the sheep.
- Snow is not an acceptable source of water for wethers, feedlot lambs and lactating ewes.
- Ice alone is not an adequate source of water whether outside or in watering devices.
- Where hand-watering is employed, producers must provide enough water and sufficient access to meet consumption demands of all individual sheep.
- Producer must ensure all sheep in the flock can easily walk to and access an adequate source of water.
- Troughs must be designed and installed in such a way as to ensure young lambs cannot get into them and drown.
- Inspect watering devices daily to ensure they are functioning and not frozen.

HEALTH MANAGEMENT

Relationship of Animal Health to Animal Welfare

- Keep accurate and detailed animal health records.

Stockmanship Skills Related to Animal Health and Welfare

- All people working with sheep must have access to a copy of the Sheep Code of Practice.
- Producers must have the resources for and knowledge of the basics of care as stated in the Sheep Code of Practice and ensure such care is provided.
- Stockpeople must be familiar with and provide the basics of care as stated in the Sheep Code of Practice.
- The stockperson responsible for the monitoring and care of the sheep must be knowledgeable of basic sheep behaviour and common signs of illness and injury.
- Stockpeople must take responsibility to become competent across a range of health and welfare skills, including body condition scoring.
- All producers are responsible for ensuring all stockpeople working with the sheep are trained.
- All producers and stockpeople must understand the reporting requirement for reportable diseases and immediately consult the flock veterinarian when suspected cases occur.
- Sheep must be monitored at intervals sufficient to ensure well-being in accordance with all sections of the Sheep Code of Practice.
- The frequency of inspection will depend on factors that affect sheep welfare such as housing, lambing, predation, fly-strike, introduction of new sheep and adverse weather conditions and must be at least daily.

Veterinary Care and Flock Management Programs

- All producers must have a valid veterinary-client-patient relationship (VCPR) with a licensed veterinarian.
- Producers must have a flock health and welfare plan.

Sick, Injured or Cull Animals

- All stockpeople must be knowledgeable of normal sheep behaviour and signs of illness, injury and disease, or work in conjunction with an experienced stockperson.
- Stockpeople must not cause, nor allow unnecessary pain or unnecessary distress by leaving a sheep to suffer.
- Sick, injured, or diseased sheep must receive prompt treatment and nursing care or be euthanized immediately. The treatment must be appropriate for the condition. If in doubt about the sheep's health or the most effective treatment, consult a veterinarian without delay.
- For sick, injured, or diseased sheep that are not responding to treatment producers must, without delay, obtain veterinary advice on appropriate care and treatment or euthanize the sheep.
- Monitoring of sick, injured or diseased sheep must be appropriate for the condition and at least daily.
- Sick, injured, or diseased animals must be segregated where it is advantageous for treatment or to limit disease transmission.

Fly-Strike

- Sheep affected by fly-strike must receive prompt treatment.
- Producers must understand the basic biology of the blowflies that cause strikes.
- Producers must determine the relative risk of fly-strike.
- Producers must take steps to reduce the attraction of flies to sheep.
- Monitor flock for fly-strike as soon as fly season begins and during prolonged damp and humid weather.

Parasite Control

- Producers must understand the basic biology of parasites that affect sheep.
- Stockpeople must monitor flock for signs of internal/external parasitism.
- Parasite control and treatment strategies must be developed and implemented on-farm.

- Parasite control and treatment strategies for tapeworms in dogs must be developed and implemented on farm.

Lameness
- Producers must monitor flock closely for lame sheep.
- Stockpeople must be able to recognize lameness, assess severity and take prompt action to resolve the lameness as quickly as possible.
- Producers must avoid maintaining sheep in wet or muddy conditions for long periods of time.
- Producers must consult their flock veterinarian regarding appropriate treatment and control strategies, which may include pain control.
- Chronically lame sheep must be culled, euthanized or under the direct care of a veterinarian.

HUSBANDRY PRACTICES

Handling, Grouping and Moving Animals
- All stockpeople must be competent in sheep handling techniques and understand sheep behaviour or be under the direct supervision of an experienced stockperson.
- Stockpeople must always work calmly and quietly with sheep; this includes minimizing noise.
- Plan procedures to minimize the frequency, duration, and degree of restraint.
- Sheep must be always handled in such a way as to minimize the risk of pain, injury, or distress.
- Electric prods are ineffective and must not be used on sheep.
- Mistreating animals is unacceptable.
- Electro-immobilization must not be used.
- Stockpeople using dogs to move sheep must be trained to handle dogs or be under the supervision of a trained dog handler.
- Dogs must be under good command and must not be allowed to force the sheep too fast nor to continue to force the sheep when they have nowhere to go.
- Dogs must not be allowed to nip or bite the sheep.
- Dogs must not be allowed to work the sheep without the handler present.

Identification
- Producers must ensure all materials used to mark sheep for identification purposes are designed for use in sheep or are non-toxic.
- Sheep identification must be performed or supervised by a competent stockperson in a way that causes minimum handling stress.
- Proper restraint and good hygiene must be used when tagging, notching, or tattooing.
- Producers must ensure applicators are sharp and that all related equipment is in good working order and maintained according to the manufacturer's instructions.
- Producers must ensure all identification requirements are met for all sheep leaving the farm.

Tagging
- Use a tag suitable for the age, size, and breed of sheep.
- Maximum two tags per ear to avoid interfering with the ear's natural position.
- Ensure the tag is positioned according to manufacturer's instructions.
- Branding is only an allowable practice if specifically required by export regulations. Where export regulations require branding, choose freeze branding instead of hot iron branding, if allowable. Use pain control, in consultation with your flock veterinarian to mitigate pain associated with branding. Branding must be performed by a competent operator. Branding must not be done on wet sheep.
- Predation Control
- Producers must be aware of predation risks in their area and develop and implement a strategy for minimizing the risk of predation.
- Producers must provide prompt and appropriate care for sheep that have been attacked by predators.
- Shearing and Crutching
- All wool sheep must be shorn at least annually and as frequently as necessary, to mitigate animal health and welfare concerns.

- Shearing must be performed by, or under the direct supervision of a competent shearer using techniques designed to minimize animal stress and injury.
- Shearing of pregnant ewes in the last month of gestation must only be done by an experienced shearer.
- All shearing related injuries must be attended to promptly and according to the flock health and welfare plan.
- Farms must have a suitable area that can be set up for shearing that is adequate in size, clean and well-lit to ensure the well-being of both the sheep and the shearer.
- All shearing equipment and clothing that moves between farms with the shearer must be cleaned and disinfected between flocks at a minimum and disinfected between animals within a flock if there is known disease transfer risk.
- When planning shearing, producers must take the time of year, expected weather, local insect season and available shelter into consideration and take steps to prevent the potential negative outcomes associated with shearing.

Hoof Trimming

- Hooves must be inspected regularly and trimmed as required to maintain hoof health and sheep well-being.
- Hoof trimming must be performed by, or under the supervision of competent personnel, using accepted techniques.
- Personnel trimming hooves must have the ability to identify signs of footrot and other diseases.
- Trimming equipment must be clean and well-maintained.
- Equipment must be disinfected between flocks and between sheep within a flock, where warranted, due of the presence of disease.

Castration

- The decision to castrate must be based on a welfare risk/benefit analysis rather than as a routine; include the basis for this decision as part of the flock health and welfare plan.
- Castration must be performed by or under the direct supervision of competent personnel using proper, clean, sanitized, and well-maintained tools, and accepted techniques.
- Producers must consult with their flock veterinarian who can provide an appropriate pain control protocol for castration.
- Producers must monitor for signs of post-operative complications and take appropriate corrective action.
- Short scrotum castration must not be practiced.

Tail Docking

- The decision to tail dock must be based on a welfare risk/benefit analysis rather than as a routine; the basis for this decision should be part of the flock health and welfare plan.
- Tail docking must be performed by, or under the direct supervision of, competent personnel using proper, clean, sanitized, and well-maintained tools, and accepted techniques.
- Producers must monitor for signs of post-operative complications and take appropriate corrective action.
- Tail docking using a surgical technique must be done by a licensed veterinarian with anesthesia and analgesia.
- Tail docking for lambs over six weeks of age must be done by a licensed veterinarian with anesthesia and analgesia.
- Rubber rings must not be applied beyond six weeks of age.
- Docked tails must cover the vulva in ewes and the equivalent length in rams. Tails must be docked no shorter than the distal end of the caudal fold.

Mulesing

- Mulesing must not be performed. As of 2023, Canada does not have activity in sheep breeds where mulesing is at issue.

Dehorning/Horn Trimming

- Horned sheep, especially rams, must be inspected regularly to ensure that neither the tip, nor any other part of the horn is in contact with the face.
- Minor horn trimming (removal of tips) must be performed by, or under the direct supervision of, a competent stockperson.
- Consult with a veterinarian regarding concerns about horns on sheep. If disbudding, dehorning, or substantial horn trimming (removal of more than just the tip) is necessary; it must be performed by a licensed veterinarian using anesthesia and perioperative analgesia.

Breeding

- Producers must make responsible and informed decisions when selecting breeds and matching rams with ewes, to reduce the risk of lambing difficulties.
- Producers need to be aware of the risk of genetic disorders that might be associated with different breeds and genetic lines and take steps to avoid propagation of such abnormalities.
- Producers must plan breeding such that appropriate supervision and shelter at lambing will be available.
- Producers must carefully consider the knowledge, skills and resources required before using an accelerated lambing system.
- If performed vasectomies, laparoscopic artificial insemination, and embryo transfers are considered surgical procedures and must be done by a veterinarian.
- Electroejaculation is a procedure that must only performed by a veterinarian.
- Rams must be managed considering the risk of aggressive behaviour to avoid risk of injury due to fighting.
- During the breeding season, producers must increase the frequency of monitoring of rams for injuries, health, and lameness.

Pregnancy, Lambing and Neonatal Care

- Monitor body condition scores and health on an ongoing basis during gestation and adjust the feeding program to maintain suitable body condition scores; seek the help of a nutritionist or veterinarian if required.
- Supervise lambing and take timely action as required, while keeping disruption and disturbances to a minimum.
- All stockpeople must be able to recognize the signs of lambing difficulty and know when and how to provide appropriate assistance and when to seek assistance from an experienced producer or veterinarian.
- All stockpeople who will be involved with caring for sheep affected by vaginal or uterine prolapse must be competent or be under the direct supervision of an experienced stockperson who is competent with managing these conditions. Other obstetrical surgeries must be performed by a veterinarian.
- Embryotomy must only be performed on dead lambs.
- Good hygiene and sanitation must be practiced when lambing assistance is required.
- In confinement systems, a clean dry area for lambing must be provided.
- Newborn lambs must be monitored for evidence that they have suckled and for signs of starvation, hypothermia, and frostbite. Prompt appropriate corrective action must be taken.
- Promptly provide newborn lambs that do not nurse voluntarily within 6 hours of birth with sufficient colostrum to help protect them from disease during their post-natal development.
- All milk replacers used for lambs four weeks of age or younger must have been formulated for lambs.

Transportation

Fitness for transport

- The fitness for transport of every animal must be evaluated within the context of each trip.
- Unfit animals must not be transported, except for veterinary treatment or diagnosis and only if special provisions are met.
- Compromised animals must not be sent to auction markets or collection yards.
- Compromised animals, if transported for slaughter, must go directly to a local abattoir.

- Sheep with injury or obvious clinical signs of disease must not be sent to auction or other sales.
- Sheep that are in the last 10% of their gestation period must not be transported.
- Neonatal lambs unaccompanied by their dam must not be transported off farm until their navel is healed and they reach seven days of age.
- Producers must take expected weather conditions into consideration when making shipping arrangements.

Arranging Transport

- Producers must be familiar with federal and provincial transport regulations.
- Producers must ensure that a competent stockperson oversees loading and unloading.

Preparing Sheep for Transport

- Sheep must be fed within the five-hour period immediately prior to being loaded unless the expected duration of the animal's confinement on the vehicle is less than 24 hours from the time of loading.
- Sheep must have access to water until time of loading.
- Lactating dairy ewes must be milked out immediately before being transported.
- Heavily lactating ewes must be dried off before shipping to auction/collection yards unless they have suckling lambs accompanying them or are intended for a production/replacement sale.
- Ensure all departing sheep and lambs are identified with an approved Canadian Sheep Identification Program (CSIP) form of identification.

Loading and Unloading

- The requirements for loading and unloading procedures and equipment as described in the Health of Animals Regulations must be complied with6.
- Sheep must never be handled by grabbing their wool as this causes pain and bruising.
- Appropriate methods must be used for moving sheep; electric prods must not be used on sheep.
- Producers must confirm that trucks are in good repair, clean and adequately bedded.
- Producers must evaluate the need for feed and water after unloading animals on farm.

For more information on the legal requirements for shipping sheep, consult The Health of Animals Regulations at: www.laws-lois.justice.gc.ca/PDF/C.R.C., c. 296.pdf

Euthanasia

Criteria for Euthanasia

- Sheep must be euthanized without delay if experiencing pain or distress and does not have a reasonable expectation of improvement and or appropriate veterinary diagnosis and treatment is not feasible.
- All farms with employees must have a written euthanasia action plan for each phase of production that indicates the criteria for deciding when to euthanize an animal and the appropriate method(s).
- Producers not familiar with euthanasia decision making and/or methods must consult with a veterinarian regarding euthanasia.
- All stockpeople must recognize when an animal needs to be euthanized, what method should be used, appropriate tool and who has been designated to perform euthanasia.

Methods of Euthanasia

- An acceptable method for euthanizing sheep must be used.
- The method of euthanasia must be quick, cause minimal stress, pain, and result in rapid loss of consciousness followed by death without the animal regaining consciousness.
- Every farm must have the ability to euthanize animals.
- All individuals performing euthanasia must have the required skills, knowledge, abilities, access to

appropriate tools and be competent to perform the procedure.
- All stockpeople must be trained on the Euthanasia Action Plan and associated euthanasia methods.
- All equipment used for euthanasia, such as firearms or captive bolt devices must be maintained according to manufacturer's instructions to ensure proper function.
- Unnecessary handling and movement of sheep prior to euthanasia must be avoided. Animals must not be dragged, prodded, forced to move on broken limbs, or made to move when pain and suffering will occur.

Confirmation of Death

- If there are any indications of returning consciousness, the euthanasia procedure or an alternate one must be repeated immediately.
- Monitor the animal until death is confirmed by lack of respiration, lack of heartbeat and dilated pupils.
- Death must be confirmed before moving, leaving, or disposal of the animal.
- All carcasses should be disposed of according to all federal/provincial/territorial and municipal regulations.

WOOL CARE

CONTAMINATION

Natural contamination in wool takes the form of feces and urine stains, pigmented and medullated fibres. Acquired contamination in wool includes vegetable matter and other hair or animal fibres (example: hair from hair breed sheep, dog hair or horse/donkey hair, alpaca fibre), as well as man-made products such as wool packs, baling twine, broken shearing combs, needles, cigarette butts and other bits of yarns or fabric. Applied contamination of wool includes spray-on paint, residue from pesticides, parasite treatment and topical medications.

Contamination of wool impacts the long-term sustainability and profitability of the Canadian wool industry. Wool with excessive contamination results in lower yields after scouring and greater fiber loss through the processing pipeline. Excessive contamination diminishes the value of wool at the farm gate and drives up the cost of wool products on the market because more fibre is lost in processing. With small adjustments to on-farm management, wool preparation and shearing, producers can greatly reduce the negative impact of contamination in their wool clip.

WOOL HARVESTING

Wool Harvesting includes shearing, wool handling (skirting, sorting, and packaging) and grading. Wool harvesting plays an important role in the wool pipeline to market. The quality of the wool harvest has a direct impact on animal health and welfare, wool quality, and ultimately the future viability of the wool industry.

Canada has between 95 and 150 full-time, part-time, and seasonal shearers. Canada does not have a recognized shearing association although there is some interest in developing one. Many Canadian shearers agree that standardized shearing protocols and education programs that foster access to courses, workshops, foreign apprenticeships, and competitions would be an asset to the entire industry.

Canada does very little scientific grading. Instead, experienced wool handlers use sensory assessment to sort wool. Visual, touch and smell evaluation of wool help wool graders sort wool. An experienced wool handler is considered an effective substitute for a certified wool grader at this time in the Canadian wool however, qualified wool graders predicted to be demand. Scientific testing of wool (core testing) is sent to foreign wool testing labs in the United States, New Zealand, and Wales.

There is no part of a sheep's fleece that is valueless or useless. All wool has an appropriate application. The poorest quality wool is now finding its value in pelletizers that convert dirty wool into fertilizer or slug repellant. The highest quality wool makes its way to yarn, garment, and interiors products.

SHEARING FOR IMPROVED WOOL VALUE

- Ensure that the facility is clean, well-lit, and well-ventilated. The facility should be large enough to accommodate the number of sheep being shorn. It should also have adequate space for the shearers, wool handlers, and other personnel involved in the process. Consider incorporating existing paddocks, laneways, and barnyards into the handling system to allow for ample space when the flock is held in the yards for extended periods of time.
- Sheep should be healthy and free from disease. They should be shorn at least once a year, preferably before lambing season. Shearing before lambing is a practice that benefits the welfare of the sheep as well as making management easier and increasing flock productivity. Shearing should not be done during extreme weather conditions such as high temperatures or heavy rain.

- Ensure that all equipment is in good working order before the day of shearing. This includes shearing machines, combs, cutters, and other tools used in the process. It is also important to have adequate supplies of wool bags, twine, and other materials needed for packaging and storing the wool.
- Ensure that there are enough shearers, wool handlers, and other personnel available on the day of shearing. It is important to have enough people to handle the number of sheep being shorn. Consider hiring additional personnel if necessary.
- Shearing can be dangerous if appropriate safety measures are not taken. Ensure that all personnel involved in the process are aware of safety procedures and have access to appropriate safety equipment such as gloves, eye protection, and ear protection.

SHEARING CODE OF PRACTICE AND STORAGE

To enable Canadian wool growers to achieve better wool preparation and higher financial returns the Canadian Cooperative Wool Growers recommends the following guidelines. Producers should also implement biosecurity measures to prevent and control the spread of disease.

- All sheep need to be emptied out before shearing (example no feed or water to be administered to the sheep for a minimum of 12 hours prior to shearing). By carrying out this practice the sheep's stomach and bladder will be empty and therefore the wool does not become contaminated with dung and urine. The sheep will also sit better for shearing as they do not struggle the same which enables the shearing process to be easier for both the shearer and the sheep. Never shear wet wool or pack wet wool.
- The belly wool needs to be kept separate from the fleece wool. The shearer should remove and throw the belly aside as the sheep is being shorn. Belly wool to be packed separately.
- All short, stained wool and tags need to be removed from the crutch area as the sheep is being shorn. This wool is kept separate from all other types of wool and packed separately.
- All fleeces should be thrown onto a wool table to enable the skirting of the fleeces to be performed in a proficient manner. Chaffy or bury wool should be skirted from the fleece and packed separately.
- The board should be swept and kept clean between sheep as well as during the shearing of the sheep.
- All fleeces should be shaken to remove any second cuts before rolling and pressing the fleeces.
- When pressing the wool all the different categories of wool are to be pressed separately. There should be no mixing of the different wool types during shearing.
- All bags are to be sewn with butcher's twine. Do not use baling twine, wire, electric fence wire, or polypropene twine to sew the wool bags and these materials are considered contaminants and will affect the outcome of wool through different transformation processes such as dyeing.
- All bags need to be identified as to their contents.
- Where possible during shearing the level of straw needs to be kept to a minimum and away from the shearing area to keep the contamination level to a minimum.
- Coloured & Blackface sheep are to be separated and shorn last so as not to contaminate the white wool with coloured fibres.
- Maintaining a clean shearing board and floor is an important and continuous process. It must be done before, during and after shearing to ensure a quality clip.
- Wool should be packed in approved packaging and then stored in a dry environment to preserve optimum quality. Wet wool has no value and wool bags are not water proof.

For more information on shearing and wool handling visit: https://wool.ca/page/wool-preparation-guide.

FARMING SYSTEMS

Production systems in Canada vary by region. Québec and Ontario producers use a mating system that aims to achieve one lambing every 8 months for each ewe of the flock (a system named “intensive” or “accelerated”). In addition to increasing productivity, this system also allows the distribution of lamb marketing over different periods of the year. In the other provinces, most of the producers breed ewes once every 12 months, usually in the fall, to get only one birth per ewe each year (this system is called “extensive”).

The extensive system favours the use of pasture and reduces production costs and work hours of producers, but it often causes problems with predators (coyotes, wolves). In some provinces farther east, the often-difficult environmental conditions related to severe temperatures make it necessary to use buildings. In intensive production regions, producers tend to keep their sheep inside barns during the entire year in a controlled environment where the handling of animals is easier. Keeping the sheep inside limits losses to predators, allows better control of diet than in the free pasture system and limits the risk of diseases such as foot rot. Nevertheless, these systems involve higher production costs than extensive systems.

The adult sheep is a ruminant, like the cow. It must therefore be fed mainly with forage. At some stages of production, when the animal’s nutritional needs are higher (mating, gestation, lactation), grain (corn, barley, oats) is added to the daily ration. A vitamin and mineral supplement is given as well to make up for mineral and vitamin deficiencies in forage, which are often a consequence of the type of soil where it is grown.

MANUFACTURING AND SUPPLY CHAIN

GRADING

The complexity of wool processing necessitates wool grading before it is sold. Medium wool goes to the woolen system and becomes rustic sweaters, knitting yarn and tweed fabrics. Finer wool enters the worsted system, undergoing an additional process called combing and drawing which removes short ends and further straightens the long, smooth fibres. This wool makes the finest of wool fabrics. Coarse wool is streamed into the carpet system.

Prior to the Covid-19 pandemic, most wool grading happened at Canadian Co-operative Wool Growers in Carleton Place, Ontario. Upon arrival wool was weighed, graded, and core tested. Grading is a hands-on process, where every fleece is assessed on the grading line. Raw wool is spread out, inspected by hand, and classified by average diameter and length of the fibre, colour, yield, and contamination. From Carleton Place the graded grease wool is packed in 1,000–1,200-pound bales and shipped to domestic and world markets.[1]

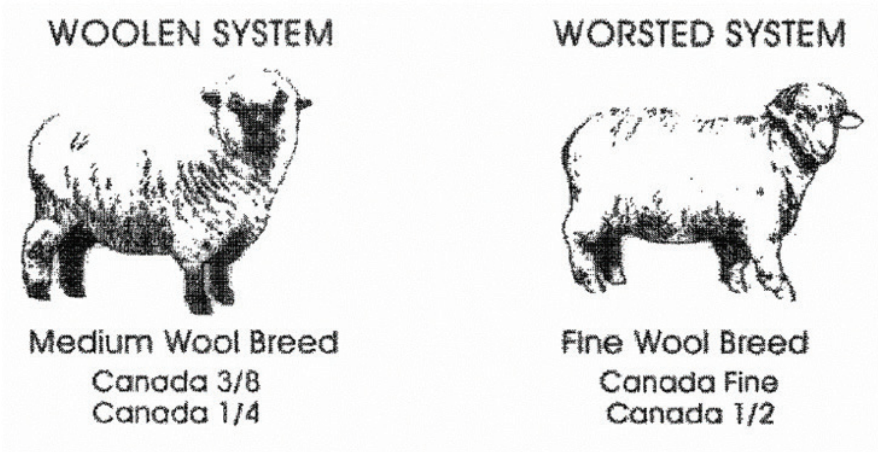

Image courtesy of Canadian Cooperative Wool Growers

SCOURING

- Small capacity scouring is 1kg – 99 kg /day.
- Medium capacity scouring is 100 kg – 2,500+ kg/day

Canada has small-scale scouring capacity through mini-mill services and in vertically integrated enterprises. There is some medium-scale wool scouring capacity in eastern and Atlantic Canada offering commercial scouring services. More medium-scale wool scouring capacity would be beneficial in western Canada. Canada has very little demand or need for high- or ultra-high-capacity scouring.

1 Source: Canadian Cooperative Wool Growers

MILLING

Mini-mills are located across Canada predominantly in rural areas. Most of Canada's mini mills are manufactured by Belfast Mini Mills Ltd. In Belfast, Prince Edward Island. Belfast Mini Mills, LTD. manufactures a full line of cottage industry fiber spinning machinery. The machinery enables the processing of raw animal fibers or man-made fibers into yarn.

Mid-Scale spinning, dyeing, weaving, and felting is available across Canada, with the greatest concentration of processing found in eastern and Atlantic Canada. Many of Canada's existing mill operations are legacy businesses now being managed by second, third and fourth generation family members.

WEAVING, KNITTING, FELTING, TUFTING

Weaving and knitting capacity in Canada is generally artisanal to small capacity. There are some examples of vertically integrated weaving and knitting centres, and some medium capacity weaving centres but generally speaking, these companies are using foreign wools and synthetic fibres due to uniformity issues and compliance with their machinery. Canada has felting at an artisanal, small scale and commercial/industrial capacity felting. Canada is home to North America's last remaining carpet tufting company.

MANUFACTURING FORECAST

New generations of investors in sustainable textile are showing interest in rekindling Canada's milling heritage. In the next 5 years, Canada will see new processing centers with enhanced equipment and capacity. Canada's recent involvement in the global wool industry has opened avenues for acquiring appropriate-scale scouring, weaving and knitting capacity. Trends toward all-natural products and locally sourced materials that tell the Canadian story will drive new trends.

BUSINESS AND ECONOMICS

INTRODUCTION

Canada has considerable roadblocks to overcome for a viable wool industry despite its niche quantity of high-quality wool that shows strong marketability potential.

Some of those obstacles include:
- Wool contamination and irregularities
- Limited access to appropriate milling in remote areas
- High transportation costs
- Skilled labour and knowledge

PATHWAYS TO MARKET

Wool Export Markets
Prior to 2020, Canada had a single outlet for sourcing and selling large volumes of wool. Across Canada, sheep producers would bring wool to regional wool depots where it was routinely collected and shipped to a central clearing house operated by the Canadian Cooperative Wool Growers. Here the wool was weighed, sorted, graded, baled, core tested, and sold to foreign interests at commodities market pricing. Until recently, this was still the most common route for moving wool off Canadian farms. Covid-19 and other global shifts have recently made this path more complicated, leaving producers exploring new options for off-loading wool.

Economic Considerations for Wool Export Market
Exporting wool to foreign markets is a simple solution for moving large volumes of wool. The downside of exporting wool is that its value is established by the global wool market which is variable and ultimately offer only very low returns for the producer. Inflation, increase in harvesting and shipping costs have meant that producers often lose money using this pathway.

Artisanal Market
Canada continues to have a strong artisanal wool sector. Some producers sell wool in small volumes (>100 kg) at the farm gate direct to hand spinners and other artisans who will undertake their own wool processing. Other producers are packaging their wool in various ways (greasy, clean, carded, spun, felted, or turned into finished products) to sell at fairs, markets, online through their own websites or on sales platforms like Etsy, or in their on-farm boutiques and kiosks. Typically, small-scale processing is serviced through commission milling at mini-mills dotted in rural communities across Canada.
A growing aspect of the artisanal sector is “indie-dyeing”. Craftspeople source undyed skeins of yarn to custom dye using plant or natural dyes. There appears to be a growing demand for natural coloured knitting yarn made of Canadian wool for these initiatives. The target clientele is high-end knitting stores, knitting clubs, and artisans who will further transform the skeins after they are dyed.

Economic Considerations for Artisanal Market
Artisanal processing (small scale processing) is more costly because of its low volume capacity, longer wait times and higher labour demands than commercial processing. Correspondingly, wool products in this sector are more expensive for the consumer and therefore the target clientele is niched. With that said, there continues to be upward trends in consumer spending on artisanal wool and natural products. The driving factor for these products is the “story” behind the product. Local, regional, small-scale, breed specific etc.

Commercial Market
Canada has some commercial processing capacity, but it would be best described as "light-commercial" or medium-capacity commercial processing, especially when compared to the processing capacity in countries like China and India.

Canada's commercial processing includes commission milling, vertical integration, and supplier services. Commission milling centres offer the service of transforming wool for a price per pound or kilogram. Vertical integration includes companies who possess all the equipment required to produce a certain product or range or products. Supplier services are companies that possess specialized equipment or skills to provide one component or service to a larger product/initiative (example: manufacturers of upholstery piping used in furniture or finishing services that create edging, hems, tagging etc…)

Commercial Market for Economic Considerations:
Canada's commercial mills face a few key issues: lack of skilled labour, ability to compete on price with off-shore processing, and succession planning.

Most medium capacity woolen mills are in rural or semi-rural areas. Them employ 25 and 40 employees. To increase capacity and become more competitive on timelines, a third shift needs to be added to the workday. With limited access to skilled labour, and mills being situated in remote areas, it is seldom possible to achieve the coveted "third shift". In recent years, Canada has relaxed restrictions on foreign skilled workers in the textile industry. Mills are now permitted to have a maximum of 15% of its labour force from outside Canada. But even offering a third worker shift per day, a mill will have difficulty competing on price with off-shore processing. Mills have thus far successfully defended their higher production costs because they have specific experience with Canadian wool, and their businesses tell a local story. Add to that, high global shipping rates and slowed supply chains overseas, there is a strong business case to be made for Canadian processing.

Pelletizing Market

Wool pelletizing companies nationwide offer a market route for soiled, short, discoloured, weak wool that would otherwise be composted. Wool pellets reduce the amount of water, petroleum-based fertilizers and pesticides needed for growing plants. When pelletized, wool helps regulate water in the soil, reducing the need for watering and increasing aeration. Pelleted wool is sold as a slug repellent and as a slow-release fertilizer with essential and micronutrients.

Economic Considerations for Pelletizing Market
Wool as fertilizer and slug repellent is a relatively new market segment. Canada does not have much commercial wool pellets on store shelves. Pellets are considered a specialty garden product available through direct-to-consumer sales channels, in specialty garden centres or through online reseller platforms like Amazon.ca. Some government tightening has happened in some Canadian provinces around classifications of fertilizers. Wool pellets have been the subject of some review. Overall, pelletizing less desirable wool appears to be a very good way to manage previously unusable wool.

EDUCATION, EMPLOYMENT, SKILLS, AND LABOUR

INTRODUCTION

In recent decades, Canada has lost much of its traditional wool knowledge. Some education programs at private and public colleges, and universities are reinvesting in textile programs but there remains a lack of training for next generation shearers, wool handlers, graders, classers, textile processing skills at the commercial level. Until more education is made available domestically, Canada must rely on skilled personnel from immigrating to Canada and/or create opportunities for Canadians to study abroad.

SKILLED LABOUR

Canada is one of the largest economic and industrial countries in the world. It requires additional labour and skilled support to maintain its current standards. Canada has created employment opportunity for eligible workers around the world who want to move to Canada as labourer in agriculture and textile processing. Under new legislation, Canadian companies are now permitted to have up to 15% of their workforce comprised of foreign workers. To be eligible to immigrate to Canada as a skilled labourer in agriculture or textile processing there are language, age, education, and adaptability requirements.

HUMAN RIGHTS AND TRAFFICKING

Human trafficking takes place within and outside of Canada. It is also a global issue that occurs in virtually all countries. The National Strategy to Combat Human Trafficking (National Strategy) is Canada's five-year National Strategy to strengthen Canada's response to human trafficking and support broader Government of Canada commitments, including preventing and addressing gender-based violence, and supporting the safety and security of Indigenous peoples, migrants, and temporary foreign workers.

For more information on Canada's Action Plan to combat human trafficking and foreign worker violations visit: https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ntnl-ctn-pln-cmbt/index-en.aspx

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ANNEX

ALL BREEDS MATRIX

All Registered Breeds (in alphabetical order)	Origin	Type	Wool Description	Micron (µ)	Average Staple Length		Average Fleece Weight	
					in	cm	lb.	kg
Arcott, Canadian	CAN	Tri purpose	Soft, lustrous	25 - 33 µ	2.5 - 3.5 in	6 - 9 cm	4.5 - 5.5 lb	2 - 2.4 kg
Arcott, Outaouais	CAN	Tri purpose	Variable	25 - 33 µ	2.5 - 3.5 in	6 - 9 cm	4.5 - 5.5 lb	2 - 2.4 kg
Arcott, Rideau	CAN	Tri purpose	Variable	25 - 33 µ	2.5 - 3.5 in	10 - 13cm	4.5 - 5.5 lb	2 - 2.4 kg
Berrichon du Cher	FR	Dual purpose	Semi fine, white	30 - 32 µ	3 - 3.5 in	8 - 9 cm	6.5 - 9 lb	3 - 4 kg
Blackface (Scottish)	GB	Mountain breed	Strong, long staple	28 - 40+ µ	6 - 14 in	15 - 36 cm	3 - 6.5 lb	1.25 - 3 kg
Bluefaced Leicester	GB	Wool breed	Fine, semi lustrous	24 - 28 µ	3 - 6 in	8 - 15 cm	2 - 4.25 lb	1 - 2 kg
Border Cheviot	GB	Downs breed	Long, strong, matte	28 - 33 µ	4 - 5 in	10 - 13 cm	5 - 10 lb	2.25 - 4.25 kg
Border Leicester	GB	Wool breed	Long, strong lustrous	30 - 38.5 µ	4 - 10 in	10 -25 cm	8 - 12 lb	3.75 - 5.5 kg
British Milk Sheep	GB	Milk breed	Medium-strong, semi-lustrous (Friendly wool)	28 - 31 µ	4.5 - 7 in	11 - 18 cm	9 - 11 lb	4 - 4.5 kg
Charollais	FR	Meat breed	Medium-fine, dense (Friendly wool)	23 - 27 µ	1.5 - 2.5 in	4 - 6 cm	4.5 - 5.5 lb	2 - 2.5 kg
Clun Forest	GB	Downs breed	Medium, dense	25 - 33 µ	2.5 - 5 in	6 - 13 cm	4.5 - 9lb	2 - 4 kg
Columbia	US	Dual purpose	Medium, heavy	23 - 31 µ	3 - 6 in	8 - 15 cm	10 - 16lb	4.5 - 7.25 kg
Coopworth	NZ	Dual purpose	Medium	30 - 39 µ	5 - 8 in	13 - 20 cm	8 - 18 lb	3.75 - 8.25 kg
Corriedale	NZ	Dual purpose	Bright, soft	25 - 35 µ	3 - 6 in	8 - 15 cm	10 - 20 lb	4.5 - 9 kg

*Denotes breed is recognized by Canadian Sheep Breeders Association but no examples of this breed are currently registered by Canadian Livestock Records Corportation.
**Denotes breed is registered in Canada as members of US or foreign breed associations.

ALL BREEDS (CONTINUED)

All Registered Breeds (in alphabetical order)	Origin	Type	Wool Description	Micron (µ)	Average Staple Length		Average Fleece Weight	
					in	cm	lb.	kg
Cotswold	GB	Wool breed	Long, lustrous and silvery	33 - 42 µ	7 - 15 in	18 - 38 cm	9 - 20 lb	4 - 9 kg
Dorper / White Dorper	ZA	Hair breed						
Dorset / Polled , Horned	AU/US	Meat breed	Bright white, dense	26 - 33 µ	2.5 - 5 in	6 - 13 cm	4.5 - 9 lb	2 - 4 kg
East Friesian	GER/ NL	Dual purpose	Fine, white or black	26 - 38 µ	3 - 6 in	8 - 15 cm	9 - 13 lb	4 - 6 kg
English Leicester	GB	Wool breed	Dense, lustrous	32 - 46 µ	5 - 14 in	13 - 36 cm	5 - 18 lb	2.25 - 8.25 kg
Finnsheep	FI	Dual purpose	Soft, lustrous	22 - 33 µ	3 - 6 in	8 - 15 cm	4 - 8 lb	1.75 - 3.75 kg
Hampshire	GB	Downs breed	Medium-strong, matte	24 - 33 µ	2 - 4 in	5 - 10 cm	4.5 - 10 lb	2 - 4.5 kg
Icelandic**	IS	North Atlantic	Dual coated	19 - 31 µ	2 - 18 in	5 - 46 cm	4 - 7 lb	1.75 - 3.25 kg
Ile de France	FR	Dual purpose	Medium-fine (Friendly wool)	23 - 30 µ	2.75 - 3.5 in	7 - 9 cm	6.5 - 13 lb	3 - 6 kg
Jacob	EN/SP	Dual purpose	Medium-strong, multi coloured	25 - 35 µ	3 - 7 in	8 - 18 cm	3 - 6 lb	1.25 - 2.75 kg
Karakul	US/ UZB	Carpet variety	Strong, coloured, hair-like	25 - 36 µ	6 - 12 in	15 - 30 cm	5 - 10 lb	2.25 - 4.5 kg
Katahdin	US	Hair breed						
Kerry Hill	GB	Dual purpose	Medium, dense, white	26 - 29 µ	2.5 - 5 in	6 - 13 cm	5 - 6.5 lb	2.25 - 3 kg
Lincoln	GB	Wool breed	Strong, lustrous	33.5 - 45 µ	7 - 15 in	18 - 38 cm	11 - 16 lb	5 - 7.25 kg
Marshall Romney								

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**Denotes breed is registered in Canada as members of US or foreign breed associations.

ALL BREEDS (CONTINUED)

All Registered Breeds (in alphabetical order)	Origin	Type	Wool Description	Micron (µ)	Average Staple Length		Average Fleece Weight	
					in	cm	lb.	kg
Merino*	SP	Wool breed	Fine, thick, bulky	20 - 26 µ	2 - 5 in	5 - 13 cm	6.5 - 40 lb	3 - 18 kg
Montadale*	US	Dual pupose	Long staple relatively soft	25 - 34 µ	3 - 5 in	8 - 15 cm	7 - 12 lb	3.25 - 5.5 kg
Oxford	GB	Downs breed	Dense, medium, soft chalky	28 - 34 µ	3 - 5 in	8 - 13 cm	6.5 - 12 lb	3 - 5.5 kg
Perendale*	NZ	Dual purpose	Lofty, high bulk, chalky, friendly fibre	28 - 37 µ	4 - 6 in	10 - 15 cm	7.5 - 11 lb	3.5 - 5 kg
Polypay	US	Dual purpose	Fine, soft,	22 - 29 µ	3 - 5 in	8 - 13 cm	7 - 11 lb	3.25 - 5 kg
Rambouillet	FR	Wool breed	Fine, even, bouncy, fairly chalky, matte	18 - 24 µ	2 - 4 in	5 - 10 cm	8 - 18 lb	3.75 - 8.25 kg
Romnelet								
Romney	GB	Wool breed	Medium coarse, silky, lustrous white or coloured	26 - 37 µ	4 - 8 in	10 - 20 cm	8 - 12 lb	3.75 - 5.5 kg
Rouge de l'Ouest*	FR	Meat breed	Dense, fine	23 - 26 µ	1.5 - 2 in	4 - 5 cm	3.5 - 6.5 lb	1.5 - 3 kg
Romanov	RUS	Hair breed	Double coated, coarse, black fibres	20.9 u + 71.9 o	4 - 5 in	10 - 13 cm	6 - 13 lb	2.75 - 6 kg
Ryeland*	GB	Meat breed	Medium, springy, chalky, coloured	25 - 32 µ	2 - 5 in	5 - 13 cm	4.5 - 9 lb	2 - 4 kg
Shetland	GB	North Atlantic	Varies - very fine to coarse, coloured	20 - 40 µ	2 - 10 in	5 - 25 cm	2 - 5 lb	1 - 2.25 kg
Shropshire	GB	Downs breed	Medium, boucy, elastic, sticky, less matte for a down variety	24 - 33 µ	2.5 - 5 in	6 - 13 cm	4.5 - 14 lb	2 - 6.25 kg
Southdown	GB	Downs breed	Fine to medium, dense, chalky	23 - 31 µ	1.5 - 4 in	4 - 10 cm	4 - 8 lb	1.75 - 3.75 kg
South African Meat Merino	ZA	Meat breed	Medium to strong - no current information	28 - 33 µ	2.5 - 4 in	6 - 10 cm	9 - 11 lb	4 - 5 kg

*Denotes breed is recognized by Canadian Sheep Breeders Association but no examples of this breed are currently registered by Canadian Livestock Records Corportation.
**Denotes breed is registered in Canada as members of US or foreign breed associations.

ALL BREEDS (CONTINUED)

All Registered Breeds (in alphabetical order)	Origin	Type	Wool Description	Micron (µ)	Average Staple Length		Average Fleece Weight	
					in	cm	lb.	kg
Suffolk	GB	Downs breed	Medium, dense, resilient	25 - 33 µ	2 - 3.5 in	5 - 9 cm	4 - 8 lb	1.75 - 3.75 kg
Texel	NL	Meat breed	Medium, coarse, bulky	26 - 36 µ	3 - 6 in	8 - 15 cm	7 - 12 lb	3.25 - 5.5 kg
Targhee		Dual pupose	Fine, bright, matte	21 - 28 µ	3 - 5 in	8 - 13 cm	10 - 22 lb	4.5 - 10 kg

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Sources:

- Canadian Sheep Breeders Association
- Canadian Cooperative Wool Growers
- The Field Guide to Fleece: 100 Sheep Breeds & How to Use Their Fibers by Carol Ekarius and Deborah Robson

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