



NATIONAL FARM ANIMAL CARE COUNCIL
CONSEIL NATIONAL POUR LES SOINS AUX ANIMAUX D'ÉLEVAGE

CODE OF PRACTICE

FOR THE CARE AND HANDLING OF

SHEEP



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Preface

The National Farm Animal Care Council (NFACC) Code development process was followed in the development of this Code of Practice. This *Code of Practice for the Care and Handling of Sheep* replaces its predecessor developed in 1995 and published by the Canadian Agri-Food Research Council.

The NFACC Code development process aims to:

- link Codes with science
- ensure transparency in the process
- include broad representation from stakeholders
- contribute to improvements in farm animal care
- identify research priorities and encourage work in these priority areas
- write clearly to ensure ease of reading, understanding and implementation
- provide a document that is useful for all stakeholders.

The Codes of Practice are nationally developed guidelines for the care and handling of farm animals. They serve as our national understanding of animal care requirements and recommended practices. Codes promote sound management and welfare practices for housing, care, transportation and other animal husbandry practices.

Codes of Practice have been developed for virtually all farmed animal species in Canada. NFACC's website provides access to all currently available Codes (www.nfacc.ca).

The Codes of Practice are the result of a rigorous Code development process, taking into account the best science available for each species, compiled through an independent peer-reviewed process, along with stakeholder input. The Code development process also takes into account the practical requirements for each species necessary to promote consistent application across Canada and ensure uptake by stakeholders resulting in beneficial animal outcomes. Given their broad use by numerous parties in Canada today, it is important for all to understand how they are intended to be interpreted.

Requirements - These refer to either a regulatory requirement, or an industry imposed expectation outlining acceptable and unacceptable practices and are fundamental obligations relating to the care of animals. Requirements represent a consensus position that these measures, at minimum, are to be implemented by all persons responsible for farm animal care. When included as part of an assessment program, those who fail to implement Requirements may be compelled by industry associations to undertake corrective measures, or risk a loss of market options. Requirements also may be enforceable under federal and provincial regulation.

Recommended Practices - Code Recommended Practices may complement a Code's Requirements, promote producer education and can encourage adoption of practices for continuous improvement in animal welfare outcomes. Recommended Practices are those which are generally expected to enhance animal welfare outcomes, but failure to implement them does not imply that acceptable standards of animal care are not met.

Broad representation and expertise on each Code Development Committee ensures collaborative Code development. Stakeholder commitment is key to ensure quality animal care standards are established and implemented.



Preface (continued)

This Code represents a consensus amongst diverse stakeholder groups. Consensus results in a decision that everyone agrees advances animal welfare but does not imply unanimous endorsement of every aspect of the Code. Codes play a central role in Canada's farm animal welfare system as part of a process of continuous improvement. As a result, they need to be reviewed and updated regularly. Codes should be reviewed at least every five years following publication and updated at least every ten years.

A key feature of NFACC's Code development process is the Scientific Committee. It is widely accepted that animal welfare Codes, guidelines, standards or legislation should take advantage of the best available research.

A Scientific Committee review of priority animal welfare issues for the species being addressed provided valuable information to the Code Development Committee in developing this Code of Practice. The Scientific Committee report is peer reviewed and publicly available, enhancing the transparency and credibility of the Code.

The *'Code of Practice for the Care and Handling of Sheep: Review of scientific research on priority issues'* developed by the sheep Code of Practice Scientific Committee is available on NFACC's website (www.nfacc.ca).



Introduction

In Canada, a number of sheep breeds and their crosses are managed under a variety of systems appropriate to the type of sheep, topography, local climate and resources available to the producer. These systems include but are not limited to range grazing, brush grazing, pasture grazing, total confinement, seasonal confinement, hybrid yarding, feedlot and dairy. There are a number of federal, provincial/territorial and municipal regulations across the country that affect sheep farming. Producers must be aware of and abide by these regulations.

Appropriate husbandry, handling and management are essential for the health and well-being of sheep. The sheep Code of Practice provides guidance to owners and employees for the welfare of sheep in their care. Owners and attendants must collectively possess the ability, knowledge and competence necessary to maintain the health and welfare of their sheep in accordance with this Code. Key knowledge required would include an understanding of the basic needs and behaviour of sheep, along with farm protocols and processes. All people working with sheep must have access to a copy of this Code.

Most husbandry systems impose some restrictions on the freedoms of sheep. However, sheep production should promote good welfare and should not cause unnecessary discomfort or distress. Producers should consider the following:

- Company of flock mates
- Emergency preparedness for fire, extreme weather events, mechanical failure, electrical failure, feed supply/access issues
- Feed and water to maintain health and vigour
- Flock health management system that includes veterinary care, disease prevention and control strategies and timely individual care
- Freedom of movement and exercise for normal behaviour
- Handling and conditions to avoid pain, fear and stress
- Neonatal care of lambs
- No unnecessary surgical alterations
- Predator and pest control
- Shelter.

Whenever the use of technology increases on the farm, consideration should be given to its effect on animal welfare¹. Automation often controls temperature, ventilation, handling and feed and water supply.

All flock sizes require adequate human resources to ensure attentive observation, care and the welfare of individual animals. There must be adequate staff and time to inspect, service and maintain all necessary equipment for routine care of the sheep.

Resources and facilities must be available to ensure consistent access to feed and water, appropriate shelter for the sheep, and disease prevention or treatment. Sick, injured or distressed animals must receive prompt and appropriate attention, treatment, nursing care or be euthanized, regardless of cost.

This Code is not intended to describe all production and management practices relevant to each stage of sheep production. Instead, principles applicable to all sectors of the industry are presented, along with some sector specific considerations.

¹ The National Farm Animal Care Council supports the following definition of animal welfare: Animal welfare means how an animal is coping physically, physiologically and psychologically with the conditions in which it lives. Physically includes pain and injury; physiologically includes environmental or disease stressors; and psychologically includes stressors that affect the senses, especially those that result in fear, fighting, distress or stereotypic behaviours due to either frustration or boredom. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry, and humane treatment.



Introduction (continued)

Anyone building new, modifying or assuming management of existing sheep facilities will need to be familiar with all local, provincial and federal requirements, including those for construction, environmental management and other areas outside the scope of this document. Individuals requiring further details should refer to local sources of information such as universities, agricultural ministries and industry resources.

The sheep Code of Practice reflects current sheep management practices. It identifies welfare hazards, opportunities and methods to promote well-being. The authors recognize that there is more than one way to provide good animal welfare for sheep.

In this Code the word sheep refers to sheep of all ages. Where special provisions for young animals apply the word lamb has been used. This Code applies to all sheep on farms in Canada.



Glossary

Analgesic(s): an agent that alleviates pain without loss of consciousness.

Anesthetic(s): an agent that induces loss of feeling or sensation, especially the loss of pain.

Awns: one of the slender bristles that terminate the glumes of the spikelet in some cereal and other grasses.

Cast: when a sheep is somewhat or fully on their back rendering them unable to regain footing.

Clamp: a tool used in castration that crushes the tissue and blood vessels leading into the testicles and stops the blood supply to the testicle. (e.g. Burdizzo is one brand of a clamp).

Comb lifter: an aluminum plate, which is fitted to the bottom of the shearing comb, to leave an insulating cover of wool on the sheep.

Confined or housed sheep: for the purpose of this Code means sheep that are continuously reared within a building or yarded area.

Cover comb: a shearing comb that leaves an insulating cover of wool on the sheep.

Creep feed: a highly palatable, solid nutritious feed offered to lambs before weaning.

Crutching: the removal of wool from around the tail and between the rear legs of a sheep and for lambing can also include the flank and around the udder to facilitate suckling.

Dags: clumps of manure stuck to the wool of a sheep, which may lead to fly-strike.

Dystocia: difficult delivery or parturition.

Embryotomy: dismemberment of a dead fetus while it is still in the uterus or vagina. Also more correctly known as fetotomy.

Fleece: the wool covering of a sheep.

Freshly shorn: refers to sheep up to three weeks post shearing.

Gentling: repeated tactile, visual and auditory contact with a human to foster positive human-sheep interactions.

Hyperthermia: abnormally high body temperature.

Hypothermia: abnormally low body temperature.

Isolation: social isolation of sheep. This is extremely stressful and must be avoided. If a sheep has to be kept apart from other sheep to prevent it from transmitting a disease to another animal, the effects of social isolation can be reduced by maintaining visual contact with other sheep.

Lee side: side of a hill that is out of the prevailing winds.

Mulesing: the process of removing the skin folds (i.e., wrinkles) around the breech area to stop wool growth, thereby preventing fly strike. **Mulesing is not an acceptable practice in Canada.**



Glossary (continued)

NSAID: non-steroidal anti-inflammatory drug; a class of drugs that can provide analgesia, anti-inflammatory and fever-reducing effects. Used for the treatment of acute or chronic conditions where pain and inflammation are present.

Perinatal period: the period of time starting one month prior to lambing and lasting until one month post-lambing.

Plan: a list of steps with timing and resources used to achieve an objective. Plans can be formal and written or informal.

Predator: any animal that preys on another species. For sheep this may include but is not limited to: coyotes, wolves, foxes, bears, cougars, lynx, eagles, turkey vulture, ravens, crows, domestic dogs.

Privacy screens: partitions, usually along a wall, forming an open fronted cubicle, used in lambing facilities that allows ewes private space in which to lamb and bond with lambs and not mix with the general population. Generally made from bales, wooden dividers, plastic panels, etc.

Producer: for the purposes of this Code defines the person with the decision making power for that operation; (e.g. flock owner or manager).

Puberty: for females is when a ewe reaches sexual maturity and exhibits estrus (heat) for the first time (5 – 12 months of age); for males it is the age at which the ram's reproductive organs become functional, his secondary sex characteristics develop and he is ready to successfully mate ewes (5 – 7 months of age).

Quarantine: the action of restricting sheep new to the flock to a location that is physically separate from other livestock for a period of time. The purpose of separating sheep is usually to prevent them from transmitting a disease to other animals, either because they are known to be diseased or because their disease status is currently unknown.

Recommended Practices: Code Recommended Practices may complement a Code's Requirements, promote producer education and can encourage adoption of practices for continuous improvement in animal welfare outcomes. Recommended Practices are those which are generally expected to enhance animal welfare outcomes, but failure to implement them does not imply that acceptable standards of animal care are not met.

Requirements: These refer to either a regulatory requirement, or an industry imposed expectation outlining acceptable and unacceptable practices and are fundamental obligations relating to the care of animals. Requirements represent a consensus position that these measures, at minimum, are to be implemented by all persons responsible for farm animal care. When included as part of an assessment program, those who fail to implement Requirements may be compelled by industry associations to undertake corrective measures, or risk a loss of market options. Requirements also may be enforceable under federal and provincial regulation.

Stockperson: for the purposes of this Code defines anyone on the farm who works with the sheep (e.g. producers, managers, employees, family or other hired help).

Trailing: moving sheep by foot from one area to another via trail, road or pasture.

Veterinarian: a person licensed to practice veterinary medicine.



Glossary (continued)

Veterinary-Client-Patient Relationship (VCPR): Health Canada considers a “valid VCPR” to exist when the following conditions apply:

- The client [Owner or owner’s agent of the animal(s)] has given the responsibility of medical care to the veterinarian and has agreed to follow the instructions of the veterinarian; and
- the veterinarian has assumed the responsibility from the client for making clinical judgment regarding the health of the animal(s), the need for medical treatment and for ensuring the provision of ongoing medical care for the animal(s); and
- the veterinarian has sufficient knowledge of the health status of the animal(s) and the care received. The knowledge has been obtained through a recent examination of the animal(s) and the premises where it is (they are) kept or through a history of medically appropriate and timely examinations and interventions; and
- the veterinarian is readily available or has made the necessary arrangements with another veterinarian, for ongoing medical care in case of adverse reactions or therapy failure.
(www.hc-sc.gc.ca/dhp-mps/vet/label-etiquet/faq_eldu-umdde-eng.php#q14).

Weaning: the practice of removing lambs from the milk diet provided by the ewe or by a milk replacement diet.

Wethers: castrated male sheep.

Wool-blindness: when excessive wool growth near the eyes interferes with the normal sight of a sheep.

Wool break: a marked thinning of the individual wool fibre diameter producing distinct weakness in one part of the fleece.

1

Environmental Conditions

Sheep in Canada are reared in a variety of production systems. Housing conditions impact the welfare of the sheep. Housing and shelter needs will vary depending on region, climate, season, lambing season, breed and the type of production system (1). When the adaptability, physical attributes and behaviour patterns of sheep are taken into consideration, various sheep management systems have the capacity to provide good welfare of the animals kept within them, provided adequate resources can be applied as needed (2).

The Canadian industry includes confinement, extensive, dairy, feedlots and hybrid operations. The details of the operation and management of that system both influence sheep welfare.

1.1 Introduction

The relationship between an animal and its environment is important for its welfare. With proper care and management sheep are able to adapt physiologically and behaviourally to cope with the wide range of Canadian climatic conditions. Provision of shelter and shade are important for protection from the effects of adverse weather conditions as described in this section.

Types of shelter will vary with the production system and the farm management.

Weather conditions can affect the welfare of fit and normal livestock, but have a greater impact on those more vulnerable because of their age (e.g. newborn lambs) or condition (e.g. freshly shorn sheep, animals suffering illness or injury).

A sheep's ability to cope with sudden changes in weather, or extreme weather events varies with many factors:

- age (especially lambs)
- degree of fleece cover (shearing)
- body condition (score)
- access to feed, water and shelter
- degree of acclimation (genetics, flock and previous exposure)
- health status.

For example, mature ewes in full fleece and in good condition can withstand a wider range of temperatures than freshly shorn ewes, new born/young lambs or compromised sheep of any age. Sheep acclimatized to particular environmental temperatures/conditions will face challenges if suddenly required to adjust to extremes of temperature outside the range to which they are accustomed (i.e. hot to cold or cold to hot).

REQUIREMENTS

Producers must promptly assist individual sheep displaying signs of heat or cold stress.

Sheep entering the flock that come from a different environment or production system must be monitored closely during the acclimation period and action taken 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.

RECOMMENDED PRACTICES

- a. select a breed or type of sheep that is suitable for the location, climate and management system.

1.1.1 High Temperature, and Humidity, and Provision of Shade

Sheep are susceptible to heat stress. In hot conditions sheep will graze early and late in the day, seek shade and drinking water, increase their respiration rate and may start to pant (3). The greatest risk for heat stress is in hot and humid conditions (4). (See *Appendix A: Livestock Safety Index Chart*). Provision of shade gives protection from solar radiation and reduces the risk of heat stress. Access to shade will improve animal comfort and may improve weight gain, milk production and reproduction.

Signs of heat stress in sheep can include (4):

- continual panting
- rapid breathing
- weakness
- inability to stand
- elevated rectal temperature.

If the body temperature continues to rise, the sheep will eventually collapse and die.

Shearing removes the protection from solar radiation (i.e. sunburn and radiant heat) provided by the fleece.

REQUIREMENTS

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 (e.g. allowing access to treed area, bringing in wagons, erecting a canopy, stacking bales)***
- ***ensuring adequate access to clean, fresh drinking water (demands for water will increase during hot weather) (See Section 3.2 Water)***
- ***avoiding the handling and moving of sheep during the heat of the day***
- ***allowing sheep to rest during the heat of the day (e.g. allow rest breaks as needed if trailing sheep long distances)***
- ***selecting an appropriate shearing season.***

1.1.2 Provision of Shelter during Cold and Windy, and Cold and Wet Conditions

Healthy mature sheep in full fleece and in good body condition with access to feed, water and a choice of appropriate shelter can cope well in cold conditions. However, freshly shorn ewes, newborn lambs, or compromised sheep at any age will require additional protection.

When conditions are cold for the sheep they will (5):

- face away from the prevailing winds
- seek shelter from the wind
- huddle together
- shift positions within the group
- shiver.

Wind combined with cold, wet conditions can compromise the welfare of sheep.

- Cold, wet and windy conditions reduce the insulation value of the fleece.
- Sheep can experience wind chill.
- Wind chill can have a severe impact on the effective temperature experienced by sheep and cause hypothermia.
- Newborn and very young lambs, freshly shorn sheep and compromised sheep are more susceptible to hypothermia.

Sheep must have access to shelter. Shelter can be provided by any natural or man-made structure that acts as a barrier to wind. This can be provided by a building, shed, or portable shelter. Tree lines, bales, the lee of a hill, etc. can also provide windbreaks.

Planning for cold, stormy weather events and providing an appropriate location for the sheep are important factors for minimizing the negative effects of cold conditions.

REQUIREMENTS

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. Properly designed and maintained hedgerows and windbreaks can be adequate, as can natural land features (e.g. lee side of a hill, bush, gully, coulees) for certain classes of animals.

Producers must plan the lambing period for the available shelter and to match local climatic conditions (e.g. provide shelter for young lambs and freshly shorn sheep).

Special considerations for management and shelter during lambing will be required under some conditions. (See Section 5.11 on Pregnancy, Lambing and Neonatal Care).

When planning for extreme weather events and winter management, a producer must consider and be able to:

- ***manage their flock to minimize the risk of hypothermia***
- ***monitor flock closely for signs of cold stress and take immediate action to provide relief if it occurs***
- ***relocate sheep to a sheltered area or shed***
- ***provide more feed (energy)***
- ***provide extra bedding where appropriate***
- ***manage timing of shearing events to minimize risk of hypothermia (e.g. if bad weather is predicted, make alternate arrangements such as delaying shearing or increasing available shelter).***

RECOMMENDED PRACTICES

- a. consult a veterinarian to establish a protocol for treatment options for sheep showing signs of hypothermia and include this in the flock health and welfare plan
- b. if adverse conditions are expected postpone shearing
- c. use a cover comb (or comb lifter) to provide some protection against cool temperatures, insects and solar radiation as this leaves more wool than a regular comb.

2

Facilities

2.1 Housing and Handling for all Sheep

Sheep in Canada are raised in different types of systems. The main ones include: outdoor, indoor, total confinement and hybrid systems that use both outdoor rearing and some housing. All facilities used in the rearing of sheep must be suitable for sheep. Describing all types of facilities used is beyond the scope of this Code.

There are plenty of resources available for producers wanting details relating to siting and construction of sheep facilities, including floor space allowances, bunk space allowances and heights, etc. Some of these resources include:

- Canadian Sheep Federation's Virtual Toolbox (www.cansheep.ca)
- Ontario Sheep Marketing Agency production manual (www.ontariosheep.org)
- Alberta Lamb Producers production manuals (www.ablamb.ca)
- Canada Plan Service (www.cps.gov.on.ca)
- Le Centre de référence en agriculture et agroalimentaire du Québec Guide: L'élevage du mouton (www.craaq.qc.ca)
- Centre d'expertise en production ovine du Québec (www.cepoq.com)

Additional resources:

- Modern Shepherd program offered through Dalhousie University Faculty of Agriculture (www.dal.ca)
- Shepherding 101: Getting Started in the Sheep Industry offered through Olds College (www.oldscollege.ca)

Sufficient floor space is required for all sheep to be able to lie down at the same time in a normal resting posture; adjust their posture; turn around, move freely around the pen/enclosure; seek shelter, food and water, and a comfortable location to rest and ruminate without interference from other sheep (1). Sheep should not be overcrowded and exposed to an increased risk of injury, disease or thermal distress due to inadequate space. The amount of a space required will vary depending on the size of the sheep, fleece length, environmental conditions, ventilation and floor characteristics. Stocking density should be such that weight gain and duration of time spent lying is not adversely affected.

Feed systems must be suitable for the type of sheep. Feeder design and height must ensure that the sheep can easily obtain feed comfortably, without injury using a standing feeding posture. The feeding equipment should be designed and managed to avoid entrapment. There must be sufficient feed space to allow sheep to eat adequate amounts; the amount of space required per sheep will vary with sheep size, fleece length, presence of horns, type of feed and feeding system. When sheep are offered feed together, there must be sufficient trough/feeder space to ensure that each sheep is able to feed comfortably and obtain sufficient food. Competition and aggression should be avoided.

The height above ground of feeding equipment should be adjusted according to the height of the sheep so that the sheep can feed comfortably in a standing posture without injury. Behavioural signs indicative of an inappropriate trough height include: inability to obtain food, eating with the front feet off the ground, eating while kneeling or lying down, difficulty swallowing because the neck is extended or the weight of the neck is supported on the trough and attempts to climb into the trough (6). The trough should be high enough to prevent contamination from feces and bedding.

Water is one of the key considerations for sheep facilities. It is imperative that sheep have access to a source of clean palatable water. (For more information relating to water, please see *Section 3.2 Water*).

Figure 1: Ideal dimensions for the feeder openings relative to size of sheep; feeder openings in these positions will allow sheep to eat comfortably and top bar will prevent sheep from climbing into feeder.

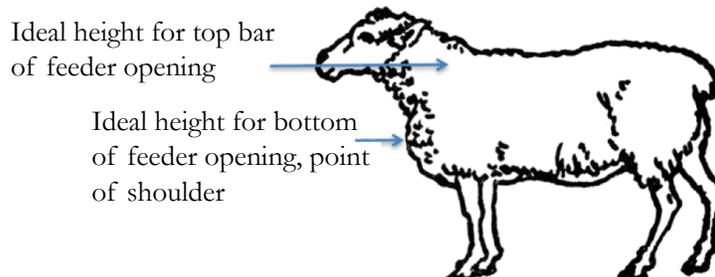


Table 2.1 shows the minimum recommended floor space requirements for sheep. Table 2.2 below shows recommended minimum feed space allotments.

Table 2.1: Minimum Recommended Floor Space Requirements for Sheep

	Ewes or Rams	Feeder Lambs
Feedlot m ² /head [ft ² /head]		
Hard surfaced	1.4 [16]	0.6 [6.5]
Soil*	6.5 [70]	2.8 [30]
Open front shed floor area m ² /head [ft ² /head]		
Pregnant ewe	1.4 [15]	0.6 [6.5]
Ewe and lamb(s)	1.5 [16]	
Ram	1.0 [11]	
Dry ewe	0.93 [10]	
Ceiling height (min)	2.7m (9 ft)	2.7m (9 ft)
Slotted floors m ² /head [ft ² /head]		
	0.65 [7]	0.4 [4.3]
% floor area slotted	100%	100%
Slot width (mm) [in]	19 [0.75]	16 [0.6]
Slat width (mm) [in]	50-75 [2-3]	50-75 [2-3]

* Soil-surfaced feedlots should be used only where annual precipitation is less than 500 mm (20 in). Provide a paved feeding strip next to each feed bunk. This paved strip should be at least 1.8 m (6 ft) wide or as wide as the tractor used for cleaning. The strip should slope 1:25 away from the feed bunk. Source: Canadian Farm Buildings Handbook, Research Branch, Agriculture Canada, Publication, 1822E, 1988, pg. 40.

Table 2.2: Recommended Minimum Feed Space Allotments

	Feed Space (length per animal)	
	Ewes and Rams	Feeder Lambs
Hand Feeding	400mm (16in)	300mm (12in)
Self Feeding	150mm (6in)	100mm (4in)

Linear space needs to be adjusted for larger or smaller sheep and degree of fleece cover.

Sick/Hospital Pens

Accessible pens should be available to house sick or injured sheep so that they can be easily and regularly observed and receive additional care as required. The use of sick pens allows extra resources (e.g. extra environmental protection, additional space, additional bedding, easy access to water and feed) to be easily provided. Sick animals can be more susceptible to cold so provision of supplemental heat may be required. The use of a sick pen can isolate diseased animals from normal animals, provide increased resources and protection from other animals and where possible sheep should not be visually isolated (7).

Facility Layout and Emergency Considerations

When designing, building or modifying sheep facilities it is important to seek advice regarding the most suitable design for the sheep to be housed, along with any federal, provincial or regional requirements, including fire or other potential emergency situations. All facilities should have provision for the sheep to be released and evacuated quickly in the event of an emergency. Consideration should be given to installing fire alarm systems that can be heard and acted upon at any time of the day or night. Having separate storage facilities for combustible materials will help to reduce potential risk of fire in the facility.

REQUIREMENTS

Barriers, pen dividers, other penning or handling structures, must be suitable for sheep and maintained and cleaned to minimize potential illness and injury (e.g. ensure there are no sharp edges and projections that might injure sheep).

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. (See also Section 4.2 Stockmanship Skills Related to Animal Health and Welfare).

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.

RECOMMENDED PRACTICES

- a. consider the amount of space needed for moving sheep and or equipment easily when designing and setting up facilities
- b. slope or mound feedlot pens, loafing areas and yards appropriately to provide dry areas and promote drainage
- c. allow space for sick/hospital pens when building or setting up a facility
- d. consider biosecurity when designing and managing animal facilities
- e. plan exit doors for emergencies and to provide protection from snow/ice slides from roofing
- f. consider alleyways and movement pathways within structures
- g. construct internal surfaces of housing and pens of materials which can be cleansed and disinfected or be easily replaced when necessary
- h. consider housing and feeding needs when developing on-farm emergency plans.

2.1.1 Temperature, Humidity and Air Quality

Air quality is very important for sheep welfare (2).

The quality of the air and environmental conditions inside the housing will vary depending on external temperature and humidity, ventilation, stocking rates (number of animals per cubic metre of air) and bedding management. Air circulation, dust levels, temperature, relative air humidity and gas concentrations must be kept within limits that promote the health and well-being of the sheep. A well-designed ventilation system that is well maintained and operated properly will help to optimize air quality in the housing. The ventilation system, whether natural or mechanical, should:

- provide adequate fresh air at all times
- distribute fresh air uniformly without causing drafts
- exhaust the respired moisture
- remove odours and gases (8).

In confinement operations, ventilation systems ensuring adequate airflow to avoid excessive heat build up are necessary to minimize the risk of heat stress (4). When ambient temperatures are high increased airflow at the animal level may assist convective cooling.

Shearing sheep prior to moving into housing can reduce the potential of thermal stress occurring and help in reducing the level of humidity.

Efforts to minimize additional moisture in the facility will help to avoid high humidity, which can be detrimental to sheep welfare. Bedding management can impact humidity levels. Bedding should be changed or topped with fresh bedding regularly to avoid moisture build up in sheep housing. In facilities with high-moisture feeding systems, more bedding will be required to manage humidity levels in the housing. Changes to diets, such as going to a high moisture feed may also affect humidity levels and require changes to ventilation management.

Sheep are able to withstand low temperatures reasonably well if they have shelter from wind and precipitation, are in good health and have ready access to sufficient appropriate feed. (See *Section 1.1.2 Provision of Shelter during Cold and Windy, and Cold and Wet Conditions* for more detail). Other than for some newborn lambs, properly designed and maintained sheep housing, does not require supplemental heat for the welfare of the sheep. (See also *Section 5.11 Pregnancy, Lambing and Neonatal Care*).

Excessive ammonia inside buildings can pose a health threat to both sheep and animal handlers. Very high concentrations e.g. 45ppm can affect growth and are aversive to sheep, but some detrimental effects can occur at about 15ppm of exposure in as little as 12 days (9). Effective ventilation avoids damaging ammonia levels (1). There are no guidelines for acceptable levels of ammonia in livestock buildings, but the Occupational Health and Safety guidelines cite an exposure level of 25ppm for humans for an 8-hour workday and a short-term exposure level of 35ppm (10). If ammonia is detectable by the human nose upon entry into the housing, it is generally considered to be at a level that requires action to be taken.

REQUIREMENTS

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.

RECOMMENDED PRACTICES

- a. seek competent advice on the design, construction or modification of buildings
- b. consider local topography when siting buildings or altering accommodations
- c. take action if ammonia is detectable by people entering the building
- d. check for drafts at animal level and adjust ventilation to eliminate drafts at animal level.

2.1.2 Social Environment and Enrichment

Sheep are social animals (11). They show flock behaviour as protection against predation. For ewes and lambs, the strong social bond that forms between a dam and her lambs can remain intact until separation. Subgroups can form within the flock and two or more sheep can also form a social bond (12) and become distressed if separated. The ability of sheep to recognize the faces of numerous other sheep and to interpret the emotional relevance of these facial features is beneficial during social interactions and the formation of social bonds (13,14). In some circumstances sheep will compete by pushing to gain access to food, but if resources such as food and space are not limited, overt dominance behaviour and fighting are not normally apparent. Fighting to establish a social hierarchy occurs more in single-sex, single-age groups than in mixed-sex groups of varying ages (15). Although there is limited information on the provision of enrichment devices and procedures, they can be beneficial in some circumstances (16). Providing visual contact with other sheep is essential to avoid isolation stress (17).

REQUIREMENTS

Sheep must have visual contact with other sheep.

2.1.3 Lighting

Sheep are seasonal animals and sensitive to photoperiod.

Sheep must be provided with an appropriate period of rest from artificial lighting (e.g. 6 hours), but they must not be kept in permanent darkness (18).

Light is also required to facilitate proper care of the animals by the stockperson, so that sheep kept in buildings can be thoroughly inspected at any time and the sheep can be handled appropriately during emergencies, shearing and during daily care routines (1). Throughout the hours of daylight, the level of indoor lighting, natural or artificial, should be such that all housed sheep can be seen clearly by the stockperson.

Appropriate lighting for handling areas is also important for the welfare of sheep. Sheep prefer moving from darker to lighter areas. Shadows can startle sheep and make moving them more difficult.

Exterior lighting of facilities can help minimize predator problems, but care must be taken to avoid affecting the diurnal cycle of the sheep.

REQUIREMENTS

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 stockpeople.

RECOMMENDED PRACTICES

- a. ensure six hours of darkness in a 24-hour period for housed sheep.

2.1.4 Bedding and Manure Management

All sheep housing areas, regardless of system, should be well-drained to avoid wet conditions that can create welfare and health challenges (i.e. foot rot) for the sheep.

Bedding provides warmth, insulation and comfort for sheep (19). Bedding should be provided in all buildings used for rearing sheep, with the exception of systems using slotted floors, to create a clean, comfortable, dry surface.

Various materials can be used as bedding for sheep. Straw, wood shavings, paper products, peat and hemp are all examples of effective bedding options (1).

In bedded pack systems, it is important to add fresh bedding material as necessary to promote good welfare of the sheep. Wet bedding begins fermenting and produces moisture, which can contribute to humidity build up in the barn.

Bedding is particularly important during lambing. Bedding in lambing pens should be clean and dry and replaced regularly.

Manure and waste presents a risk for spread of disease or other contaminants. Waste may be an attractant for scavengers, predators and pests. Waste management plans establish what is to be done with the various wastes generated at the site, including manure. Waste management plans should include details on removal, transportation, storage and disposal of manure focused on minimizing potential risks associated with the waste. (Refer to the National Sheep On-farm Biosecurity Standard available from the Canadian Food Inspection Agency; visit their site: www.inspection.gc.ca).

REQUIREMENTS

Bedding must be provided in all buildings used for rearing sheep, with the exception of 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.

RECOMMENDED PRACTICES

- a. establish a waste management plan that includes details and procedures for waste removal, storage, transport and disposal.

3 Feed and Water

Desired outcome: Sheep are in optimum health and body condition.

3.1 Nutrition and Feed Management

Sheep need to be monitored on a regular basis and feed resources must be well managed and readily available according to the animals' changing needs and environmental conditions. Sheep that are not fed adequately will lose body condition and will not perform to their capacity.

Body condition scoring (BCS) is a tool widely used by livestock producers as an aid to flock management (20). On-farm husbandry and management directly influence body condition; therefore, condition scoring can be a key tool for on-farm assessment and management of sheep welfare. Both emaciation (a BCS of less than 2 out of 5) and obesity (BCS of 4 or greater out of 5) can compromise the health and welfare of the individual sheep and the flock. Ewe condition has a major effect on lamb development and survival. Obesity is a particular welfare concern for pregnant ewes, which may experience reduced appetites and be at risk for developing pregnancy toxemia. Emaciation may result from inadequate feed intake, chronic disease, or teeth problems (21). Target body condition scores will vary depending upon stage of production (*Table 3.1* and *Appendix B: Body Condition Scoring*). Body condition scoring also allows producers to optimize the utilization of feed resources and animal productivity. In annual lambing systems the weaned ewe has approximately 14 weeks to regain condition lost during lactation. In accelerated systems the interval between weaning and breeding is very short. It is therefore important to the ewes' well-being, to attempt to maintain a consistent body condition for accelerated flocks. Be aware that body condition scores are most applicable to mature sheep and may be of little use for lambs under 6 months of age.

Table 3.1: Body Condition Score Targets for Breeding Flock on an Annual Production System

Stage of production	Body Condition Score
Breeding	3
Early – mid gestation	3
Lambing	3+
Ewe at weaning	2+
Rams – pre-breeding	3+

- *Individual variation in body condition is expected in any population, the target scores are intended to be the flock average not individual animal scores*
- *Aim to have as many sheep as possible at condition scores stated for each stage of production*
- *Ewes in accelerated flocks should be maintained at a consistent body condition score*
- *Some dairy and prolific breeds carry a higher percentage of internal fat compared to meat breeds and target body condition scores need to be adjusted accordingly (e.g. dairy ewe scoring a 2.5 will have same amount of total body fat as a meat breed scoring 3 (22)).*

Feeding space required depends on: type of feed, feeding frequency, presence of horned animals, animal size and group size. Increased animal density in the pen increases competition among sheep for access to feed, water and resting areas. Reduced space per animal at the feed bunk also increases competitive interactions among sheep, reduces bunk attendance times and increases the time spent waiting for access to feed. This might not cause problems for dominant animals, but it does directly affect subordinate animals and can result in uneven feed intakes and reduced growth. (For more information on feeding space requirements see *Section 2 Facilities*).

Sudden changes in diet composition can have a negative impact on the health and welfare of sheep. Changes to diet composition should be introduced gradually to allow sheep to adapt and prevent digestive problems (such as acidosis or grain overload) that can be associated with a change in diet. The fibre content of the concentrates will vary with the degree of processing of the grains in a diet. Some studies suggest that there are fewer digestive upsets and that lambs perform better if whole grains are used (23).

When feeding total mixed ration (TMR) mixes, haylage and silage, sheep should be provided with fresh feed and any which is stale or contaminated should be removed from troughs before more is added. Feed should be palatable and of good quality. It is especially important to dispose of silage that has deteriorated in storage or in the feed trough.

Provincial technical specialists, nutritionists and veterinarians are a useful source of assistance when determining feed programs or trouble-shooting nutrition related concerns.

REQUIREMENTS

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.

With the exception of 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. (See also Section 4.4 Sick, Injured or Cull Animals).

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 (e.g. weeds toxic to sheep, lead batteries, fertilizer, treated seed, antifreeze, nitrates) and to feed with physical qualities (e.g. awns) that could cause injury or limit intake.

RECOMMENDED PRACTICES

- a. test nutrient content of feed ingredients used and balance rations as necessary; consult a nutritionist for advice
- b. become familiar with potential micronutrient deficiencies or excesses in the geographic area and use appropriately formulated supplements
- c. manage feedstuffs in a way to maintain quality and minimize spoilage.

3.1.1 Colostrum Consumption

The early nutritional status of lambs has a marked influence on their later productivity. Colostrum is the first milk produced by newly lambed ewes and is characterized by high energy and antibody content. Colostrum intake affects the immediate and future health and welfare of lambs. (See *Section 5.11 Pregnancy, Lambing and Neonatal Care* for requirements relating to colostrum consumption).

3.1.2 Artificial Rearing

With time and access to a fibrous diet, ruminants develop the ability to digest plants based diets; however, neonatal ruminants are not initially capable of digesting starch and sucrose (24). Therefore, lambs that are artificially reared require a milk replacer that is high in milk fat and has good quality milk-based protein in the first weeks of life. Lambs being artificially reared should have a good quality milk substitute available until they are able to consume sufficient solid feed for their needs. Lambs weaned between 15 and 30 days of age and weighing between 7 and 13.5kg (15 and 30lbs.) need specialized care by a competent person aware of their extra needs.

A lamb creep ration, high quality roughage (e.g. hay) and clean fresh water should be available on a free choice basis by one week of age to promote rumen development.

REQUIREMENTS

Newborn lambs that are taken from their dams must receive colostrum within six hours of birth. (See also Section 5.11 Pregnancy, Lambing and Neonatal Care).

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.

RECOMMENDED PRACTICES

- a. follow proper sanitation procedures for milk feeding equipment and utensils
- b. keep feeders and water containers clean and remove any stale feed or milk. Automatic feeding equipment should be cleaned and sanitized at regular and frequent intervals
- c. use feeding practices that will reduce the risk of abomasal bloat. This includes ad lib feeding of cold fresh milk replacer, use of acidified milk replacer, or other methods as recommended by the flock veterinarian or nutritionist.

3.2 Water

Consumption of sufficient water is essential for bodily functions and plays an important role in temperature regulation. It is imperative that all sheep in the flock can easily walk to and access an adequate source of water. The water source must be within a reasonable distance of their location.

Consumption of water may vary greatly depending on the type and size of the sheep, physical state, health, level of activity, dry matter intake, quality of water, temperature of water and the environmental temperature. The water intake requirement is affected by the amount needed for body growth, fetal growth or lactation and that lost in urine, feces, respiration and sweat. Anything that influences these needs will influence the requirement. As a general rule, voluntary water consumption is 2 or 3 times dry matter consumption and increases with high-protein and salt-containing diets.

During the winter, it is important that feed intake is not limited by a lack of water as there are increased energy needs during periods of cold temperatures. There is limited research on snow as a sole water source for sheep; however, there are many on-farm examples where snow is being used during winter grazing and out-wintering away from buildings. This remains a contentious issue and relevant research on the welfare impact of this practice is required. Successful management of snow-only systems relies on attentive observation not only of the sheep, but also the quantity of snow and its quality (e.g. reasonably loose versus hard packed). Reduced water intake is a risk factor for urinary calculi in wethers.

Water quality is important to sheep. Water quality may affect feed consumption and animal health since poor water quality can result in reduced water and feed consumption (25). Sheep are adaptable to a certain amount of variation in water quality and composition given time to adjust to the change. They do tend to be persistent in their habits; it can be a problem to get sheep to consume water from a different source with a sudden or short-term change (e.g. newly purchased animals unaccustomed to chlorinated water, may not drink sufficient amounts if only chlorinated water is available).

Watering systems must be suitable for sheep (e.g. placed at appropriate heights and run with appropriate water pressure).

Lactating sheep require more water than dry ewes. Dairy sheep require more water than non-dairy flocks to meet their needs. Dairy operations have high water demands (e.g. sanitation, equipment).

REQUIREMENTS

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.

Snow is acceptable as a sole water source for the breeding flock if:

- ***it provides sufficient water each day to satisfy their water intake needs***
- ***the sheep do not show signs of dehydration***
- ***the sheep are gradually acclimated early in the cold season***
- ***the sheep are healthy, non-lactating and maintain a good body condition i.e. a score of 3 or higher***
- ***feed intakes remain at levels that promote health and welfare***
- ***the sheep have the physical ability to move to clean snow and eat it***
- ***the snow is not hard packed, trampled or soiled***

- ***all sheep, their environment and snow conditions are monitored daily and***
- ***a back-up water source can be made available without delay, either by moving the sheep to an area with a source of water or by hauling water if the snow source becomes unsuitable because of trampling, soiling or winter thaws etc.***

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.

RECOMMENDED PRACTICES

- a. Provide water at all times, especially during lactation.

4 Health Management

4.1 Relationship of Animal Health to Animal Welfare

Animal health is an important component of animal welfare. Animal health can be affected by many factors, including: nutrition, ventilation, housing and management practices. An animal's well-being is impacted by pain and discomfort. Health issues can cause pain and discomfort. Good animal welfare, therefore, requires good animal health.

Prevention is always preferred to treatment. Flock health and welfare plans and biosecurity protocols can help prevent and contain diseases.

On-farm record keeping relating to health issues, like the incidence or prevalence of diseases, serve as tools to help assess animal health and welfare on an individual basis and overall flock health status. On-farm record keeping could take a number of forms ranging from a pocket notebook to a computerized record keeping system. Records could include: diagnosis, treatment, drug administration, vaccination, reproductive events and mortality.

Health problems that are caught and dealt with quickly will affect fewer animals (26).

REQUIREMENTS

Keep accurate and detailed animal health records.

RECOMMENDED PRACTICES

- a. participate in continuing education activities related to animal health and welfare
- b. participate in animal health/surveillance programs.

4.2 Stockmanship Skills Related to Animal Health and Welfare

On-farm management practices influence animal health, animal welfare and productivity. Stockmanship skills are important for maintaining animal health and welfare on the farm (27).

Familiarity with sheep behaviour will ensure workers have a better chance of identifying abnormal behaviour quickly. Health problems that are identified and dealt with quickly will affect fewer animals.

REQUIREMENTS

All people working with sheep must have access to a copy of this Code.

Producers must have the resources for and knowledge of the basics of care as stated in this Code and ensure such care is provided.

Stockpeople must be familiar with and provide the basics of care as stated in this Code.

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 this Code.

The frequency of inspection will depend on factors that affect sheep welfare at any particular time, such as housing, lambing, predation, fly-strike, introduction of new sheep and adverse weather conditions and must be at least daily.

RECOMMENDED PRACTICES

- a. incorporate written best management practice protocols within the flock health and welfare plan
- b. ensure staff are trained in and apply best management practices.

4.3 Veterinary Care and Flock Management Programs

Veterinarians are an important resource for helping producers establish and implement effective flock health and welfare plans. A valid **veterinary-client-patient relationship (VCPR)** helps ensure that your veterinarian will be familiar with your flock and management practices, in the event that a problem occurs. In a VCPR relationship the producer and veterinarian make collaborative decisions on health, management and welfare outcomes for sheep based on their joint assessment of the situation. A valid VCPR is essential for producers to obtain prescription only drugs.

A flock health and welfare plan should cover the yearly production cycle (28). The complexity of a flock health and welfare plan will differ depending on the flock size and circumstances; in a small flock, a structured discussion between the producer and veterinarian may be sufficient. In a larger flock with employees, it should take the form of a written set of standard operating procedures (SOPs) available to all stockpeople. The plan should be reviewed annually.

Suggested elements of an effective plan include:

- a record keeping system with associated benchmarks and targets
- a schedule for flock inspection/shepherding
- breeding management
- nutritional/pasture management
- disease prevention and management
- a risk benefit analysis of painful husbandry procedures
- a pain control strategy
- a plan for reducing lamb mortality
- SOPs for decision making for medical emergencies, culling and euthanasia
- managing biosecurity threats (refer to the National Sheep On-farm Biosecurity Standard available from the Canadian Food Inspection Agency; visit their site: www.inspection.gc.ca)
- an emergency action plan (e.g. for flood, fire, market breakdown)
- a corrective action plan for key problems.

Sufficient records to allow assessment of flock performance must be maintained as part of a flock health and welfare plan.

REQUIREMENTS

All producers must have a valid veterinary-client-patient relationship (VCPR) with a licensed veterinarian. (See Appendix C: Accessing Veterinary Services).

Producers must have a flock health and welfare plan.

RECOMMENDED PRACTICES

- a. prepare a written health and welfare plan for each flock. It should be developed with appropriate veterinary and technical advice and reviewed and updated annually
- b. participate in an established flock health program.

4.4 Sick, Injured or Cull Animals

Through good management it is possible to maintain a flock with low incidence of sickness and injury. When sickness and/or injury do occur, providing sheep with comfort and appropriate care are priorities for sheep welfare. Consulting with a veterinarian about the inclusion of pain control, fever relief and inflammation control (e.g. use of non-steroidal anti-inflammatory drugs [NSAIDs]) in a treatment plan can facilitate welfare and positive outcomes for the sheep.

Where any flock of sheep exists there will be incidents of illness, injury, or reasons for removing animals from the flock. In general, producers provide immediate response and medical treatment. When treatment fails or is not feasible sheep should be culled or euthanized (see *Section 6.1.1 Fitness for Transport*). The flock should be monitored regularly and individual animals to be culled should be identified early and before welfare or production issues occur. Surgeries other than those specifically listed in the *Section 5 Husbandry Practices* section and first aid must be performed by a veterinarian.

Sick, injured, or diseased sheep should be identified and treated, euthanized, or slaughtered on-farm without delay. If in doubt about the sheep's health or the most effective treatment, consult a veterinarian without delay. If a sheep does not respond to treatment, seek veterinary advice, or euthanize without delay.

Disease detection in sheep requires careful observation to detect subtle changes in behaviour (29). Sheep tend not to display overt signs of illness. Everyone responsible for sheep care should be able to recognize both normal behaviour and signs of sickness, injury or disease. Health problems will be identified earlier if stockpeople monitor the flock regularly and not just at feeding time.

The following signs may indicate illness, injury, or disease in sheep (29):

- depressed appetite
- not chewing properly or are salivating excessively
- not chewing their cud
- separated from the group or are slow to get up to follow the flock
- depression:
 - head hanging down
 - ears droopy
 - eyes dull or sunken
 - hunched stance (back arched with front feet and back feet placed close together beneath the animal)
 - sudden lack of maternal interest
- look empty or shrunken (flanks are sunk in and hook bones are easily seen)
- manure stains on their fleece indicating diarrhea, with or without blood
- straining

- look “too full,” especially on the left side, which may indicate bloat
- noisy breathing, coughing, snotty noses, or grunting respiration
- grinding their teeth or lip curling
- lameness or odd gait, either staggering or circling, or those that are holding their head in an abnormal position
- reluctant to move readily; they may show signs of lameness or stiffness
- spending excessive time recumbent
- not coming up to feeder or standing at feeder but not eating
- display abnormal excitement or agitation
- display signs of excessive itchiness and wool chewing
- abnormal appearance of udder or genitalia
- abnormal discharges or odour

Sheep displaying any of these signs require a thorough examination and assessment. (See *Appendix D: Individual Examination and First Aid*).

Keeping records is an important practice for animal health and welfare and food safety. Producers are encouraged to establish a record keeping system suitable for their farm. The Food Safe Farm Practices (FSFP) program has record keeping templates available. Records are important for disease prevention, disease surveillance, consistency and continuity of treatment, food safety and traceability, breeding selection and improvements in production.

To access the record keeping templates, contact the Canadian Sheep Federation for information or access the templates at: www.cansheep.ca

REQUIREMENTS

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.

Surgeries other than those referenced in Section 5 Husbandry Practices and first aid, must be performed by a licensed veterinarian.

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.

RECOMMENDED PRACTICES

- a. keep up-to-date with diseases of livestock and the preventative strategies and remedial treatments available
- b. observe flocks in confinement at least daily, more often during late gestation through early lactation
- c. configure pens and yards to facilitate easy visual inspection of all areas used by the sheep
- d. keep records of disease occurrence and all treatments provided
- e. maintain records of reasons for culling, euthanasia, or death on farm to identify trends and reduce on-farm mortalities.

The list of topics covered in Section 4.4 (including 4.4.1, 4.4.2 and 4.4.3) is not exhaustive but provides information on topics that are particularly relevant to sheep.

4.4.1 Fly-Strike

Fly-strike is a serious welfare issue for sheep (30). Fly-strike occurs when the eggs of blowflies are laid and hatch in moist or manure-stained wool and the maggots migrate to the skin and begin feeding on the flesh of the live animal. The maggots create painful multiple wounds, which, if undetected, can debilitate the animal to the extent that it eventually dies of shock, secondary infections and blood poisoning.

In Canada, there is no approved product to prevent or treat fly-strike; therefore, producers must rely on sound practices to reduce risk.

An important skill is identification of fly-strike. Common indicators of fly-strike include:

- a small visible damp spot
- severe irritation/scratching
- biting or rubbing the hindquarters
- difficulty keeping up with the flock.

The risk of fly-strike is influenced by weather, management strategies that impact the number of flies, geographical region and individual animal parameters (e.g. wet conditions, dags on hindquarters, head wounds in rams and footrot).

REQUIREMENTS

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 based on:

- ***predisposing environmental factors***
- ***predisposing sheep traits***
- ***relative risk factors (dags and long tails; wet wool in warm, humid conditions; footrot; open wounds)***
- ***the seasonal presence of blowflies.***

Producers must take steps to reduce the attraction of flies to sheep:

- ***consider the risk of fly-strike in the risk/benefit analysis when deciding to tail dock (Refer to Section 5.7 Tail Docking for more information)***
- ***preventing diarrhea or treating it quickly if cases do occur and crutching accordingly***
- ***cleaning and treating wounds quickly***
- ***shearing animals before fly season.***

Monitor flock for fly-strike as soon as fly season begins and during prolonged damp and humid weather.

For information on treating fly-strike refer to:

- Canadian Sheep Federation's Virtual Toolbox www.cansheep.ca
- Ontario Sheep Marketing Agency production manual www.ontariosheep.org
- Alberta Lamb Producers production manuals www.ablamb.ca
- Le Centre de référence en agriculture et agroalimentaire du Québec Guide: L'élevage du mouton. www.craaq.qc.ca
- Centre d'expertise en production ovine du Québec www.cepoq.com

RECOMMENDED PRACTICES

- a. be aware of advances in fly-strike control and treatment options
- b. consider implementing a baiting system for specific fly species.

4.4.2 Parasite Control

Parasites can be a major issue for sheep flocks in Canada. There are two main classifications of important parasites in this area: internal parasites (endoparasites) and external parasites (ectoparasites).

Parasites cause a range of welfare problems including disease, emaciation, anemia, irritation and can kill animals if left unchecked (26). Preventing and controlling parasites is important for sheep welfare, economic reasons and welfare of other species (e.g. dogs and *Cysticercus ovis* (*C. ovis*)) (31). Resistance to treatment is a significant consideration when developing parasite control strategies. It is important to work in conjunction with the flock veterinarian to accurately assess the problem and develop specific control and treatment strategies.

For information on parasite control see:

- Handbook for the Control of Internal Parasites of Sheep (2012), Contact person: Dr. Paula Menzies, Dept. Population Medicine, Ontario Veterinary College, University of Guelph (www.ontariosheep.org).
- Gestion intégrée du parasitisme gastrointestinal chez les moutons (2007), Centre d'expertise en production ovine du Québec (CEPOQ) (www.cepoq.com).
- Don't risk zero income from your lambs! Alberta Sheep Smart Factsheet. Alberta Lamb Producers (www.ablamb.ca).

REQUIREMENTS

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; work with the flock veterinarian to develop a control strategy tailored to the farm location and management.

Parasite control and treatment strategies for tapeworms (i.e. *Cysticercus ovis*) in dogs must be developed and implemented on farm.

RECOMMENDED PRACTICES

- a. include parasite control and treatment strategies in the written flock health and welfare plan.

5

Husbandry Practices

5.1 Handling, Grouping and Moving Animals

Sheep are handled and subjected to different management procedures. These procedures are undertaken for health reasons (e.g. vaccination, dipping, foot bathing) and for production reasons (e.g. shearing and sorting). Many of these handling and management procedures are stressful to sheep (33).

Understanding the behaviour of sheep facilitates handling, leading to reduced stress and injury and improved handler safety (34).

Sheep are sensitive to the predictability and familiarity of their environment. Sudden changes can easily startle sheep. The handling environment will affect their responses. Sheep are social animals with very strong flocking and following instincts. These behaviours can be utilized to facilitate handling procedures (11,33). Handling sheep in groups reduces stress to individuals (35). Good handling facility design should make use of the natural behaviour of sheep. Sheep have a flight zone in which they try to distance themselves from the handler. A safe distance to follow behind the flock is about three body lengths (3-4 metres). Using positive reinforcement during handling (e.g. a food reward), habituating sheep to the handling area and using familiar handling system layouts; can help to reduce the stress of handling procedures and the use of dogs and humans as fear inducing stimuli (33). Unfamiliar humans, movement, shouting and proximity to dogs, particularly if barking, can cause fear (33).

Reducing the fearfulness of sheep when handled can increase handling efficiency, reduce the incidence of injuries, create a calmer flock and improve performance. Sheep are capable of learning from one experience and can remember good and bad experiences. Previously learned aversion to a stressful handling procedure might diminish over time if it is not repeated (35). Sheep have a strong ability to recognize individual people (36,37,38). Fostering positive human-sheep interactions (e.g. providing some gentling with humans) is therefore important for animal welfare.

Use the minimal amount of restraint possible when handling sheep (e.g. hand restraint under the jaw). Do not lift, drag or pull sheep by the fleece, tail, legs, ears, neck or horns as this can cause pain and bruising. In an open area a crook can be used to catch a sheep by the neck or leg.

A well-trained dog can save a producer a great deal of effort when herding and moving sheep. Herding dogs can represent a threat and induce fear in sheep, especially in sheep unfamiliar with them. If using herding dogs, it is essential that they be well trained. Most breeds of herding dogs have strong instincts to stalk and chase livestock. If these instincts have not been properly channeled through training, herding dogs will generally do more harm than good by chasing sheep erratically, running through the flock, or becoming overly aggressive towards the sheep. Dogs may become overly excited with sheep in confined areas, particularly if the flock is not moving well. Therefore it is critical that where dogs are used in confined spaces they must be appropriate (i.e. dogs that bark rather than eye dogs). The sheep will remember the frightening experience and may be reluctant to enter the handling system the next time. If a trained dog is purchased, be sure to take some time to learn commands that the dog already knows; improperly trained people may be just as frustrating for dogs, as poorly trained dogs are to shepherds.

REQUIREMENTS

All stockpeople must be competent in sheep handling techniques and have an understanding of sheep behaviour, or be under the direct supervision of an experienced stockperson.

Stockpeople must work calmly and quietly with sheep at all times; this includes minimizing noise (e.g. from people, herding dogs and equipment) as much as possible.

Plan procedures to minimize the frequency, duration and degree of restraint.

Sheep must be handled at all times in such a way as to minimize the risk of pain, injury, or distress. For example sheep must not be:

- **dragged or lifted by the fleece, tail, legs, ears, neck or horns**
- **grabbed by the fleece**
- **held on their side or back for more than a few minutes at a time especially if the rumen is full or if they are heavily pregnant.**

Electric prods are ineffective and must not be used on sheep.

Mistreating animals is unacceptable. This includes, but is not limited to: kicking, striking, slamming gates on sheep.

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.

RECOMMENDED PRACTICES

- a. use a well-designed, easily operated handling system, designed specifically for sheep, that is appropriate in size and scale to suit the flock numbers
- b. ensure handling facilities and equipment are in place and in good working order
- c. familiarize sheep with the handling facilities to help facilitate willingness of the sheep to enter the handling system
- d. consider positive reinforcement (e.g. feed rewards) to encourage positive response for future handling
- e. take advantage of the natural behaviour to encourage free movement (See *Appendix E: Understanding Sheep Behaviour*)
- f. employ methods on farm (i.e. gentling) to help sheep become accustomed to the presence of people
- g. minimize isolation of individual sheep
- h. working sheep with dogs can be stressful and should be limited to times where their use is necessary.

5.2 Identification

Animal identification is essential to many aspects of a successful sheep operation; from animal health and on-farm management to food safety and quality assurance. Identification can be temporary or permanent. The most common forms of permanent identification for sheep are ear tagging, notching and tattooing. In Canada, all sheep must be identified with an approved ear tag before leaving the farm of origin (39). For more information on the Canadian Sheep Identification Program visit www.cansheep.ca.

There will be some stress associated with catching and handling a sheep for identification, but this is transient. There is immediate pain when a sheep is tagged, notched, or tattooed, but long-term pain is unlikely unless the site is damaged or becomes infected (40,41). Employing proper hygiene practices and well-maintained, sharp application equipment helps reduce the potential for infections related to identification methods. Proper handling and restraint help minimize the risk of ear damage during application. Tags must be suitable for the age and breed of sheep. Tag should be inserted at the correct location, avoiding significant blood vessels and ideally not introduced on days when fly activity is high (42).

Hot iron or freeze branding are not commonly used practices on Canadian sheep farms; and are not recommended as identification methods. Currently sheep being exported to some regions are required to bear a permanent identification mark in some circumstances. Until these regulations change, branding is an allowable practice only if required by export regulations.

REQUIREMENTS

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 the minimum of handling stress.

Proper restraint that is appropriate for the size of the sheep must be used when tagging, notching or tattooing.

For permanent identification methods, it is important to practice good hygiene because the skin on the ear will be broken. Ensure the applicators, ears and the stockperson's hands are clean and dry before the procedure.

Producers must ensure applicators are sharp and that all related equipment is in good working order and maintained according to the manufacturer's instructions.

When using tags:

- ***use a tag suitable for the age, size and breed of sheep***
- ***use two tags maximum per ear to avoid interfering with the ear's natural position***
- ***ensure the tag is positioned correctly (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.

Producers must ensure all identification requirements (i.e. Canadian Sheep Identification Program [CSIP], export requirements) are met for all sheep leaving the farm.

RECOMMENDED PRACTICES

- a. apply identification at times when fly activity is low
- b. consult with a veterinarian if infection or other problems develop.

5.3 Predation Control

Predation of livestock by wild, feral, or domestic animals can have severe consequences on animal welfare, by causing fear, stress, pain, or injury. In many cases sheep that have been attacked are not killed, but are left with significant injuries. The sheep that are not injured are likely to experience considerable stress from being chased (2). Domestic dogs may chase and attack sheep as part of their normal behaviour; and therefore, they must be considered as potential predators.

Sheep are vulnerable to predators because they do not have an effective way of defending themselves from an attacking predator. Their behaviour has evolved to provide vigilance to predation that makes them fearful of sudden unfamiliar events and this can cause them to run away from the predator and either flock together or scatter. All classes of sheep are susceptible to predation.

There are many management practices that producers can employ to try to reduce the threat of predation to their flock. Check with local or provincial authorities for possible predator control methods suitable for a specific area. Potential methods of predator control include: supervision, fencing, confinement, moving sheep to a less vulnerable area, repellants, livestock guardian animals and lethal control. In areas of high predation, even with predator control strategies, predation incidents cause significant welfare challenges to sheep. In these areas, it may be necessary to consider the feasibility of a sheep operation.

When predator attacks do happen, producers must deal with the situation promptly and in such a way to minimize pain and suffering for the animal. Predation control strategies should be re-evaluated when a kill occurs to assess if predator control can be improved in any way.

REQUIREMENTS

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. (See Section 4.4 Sick, Injured or Cull Animals and Section 7 Euthanasia for more information).

RECOMMENDED PRACTICES

- a. include a predation control strategy within the flock health and welfare plan
- b. use predation control measures appropriately to avoid non-predators being exposed to traps, relaxed cable restraints, snares, etc.
- c. consider the feasibility of keeping sheep in areas of lower predation or changing the production system to reduce the risk of predation
- d. recognise the signs of predation and examine dead or injured sheep to identify likely predators
- e. report predation incidents to the appropriate authorities (e.g. provincial agency).

5.4 Shearing and Crutching

Shearing has been shown to be stressful for sheep; however, a bulky fleece can interfere with the mobility of sheep and predisposes them to casting. It also helps to minimize external parasites, wool blindness and fly-strike (43). Having too much wool increases the susceptibility of the sheep for overheating.

Shearing must be done at least annually. Crutching is commonly done prior to lambing. In some situations additional trimming at other times of the year to prevent fly-strike or wool blindness may be desirable. Shearing may be done using hand operated shears or powered devices (e.g. electrical).

Taking animals off feed and water for six to 12 hour prior to shearing will reduce rumen and bladder fill thus reducing the animal's discomfort and soiling of the shearing area which can be a safety concern. This will also reduce the restraint time because the sheep are less likely to struggle.

Shearing must be performed by, or under the direct supervision of a competent shearer, using techniques designed to minimize animal stress (44). (See *Section 5.1 Handling, Grouping and Moving Animals*). It is important to be aware of the risk of spreading disease between flocks or between animals within a flock during shearing. 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.

Shearing removes the most of the insulation used for protection from bad weather, wind and solar radiation. Wool also protects sheep from biting insects. Therefore, it is important to consider the time of year, expected weather, local insect seasons and available shelter when planning shearing.

In Canada, accessing professional shearers can be challenging in some areas, so it is important to plan ahead (45).

REQUIREMENTS

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 (e.g. hypothermia, sunburn, biting insects, health problems).

RECOMMENDED BEST PRACTICES

- a. consider using a cover comb or comb lifter to leave an insulating layer of wool, if shearing must take place during poor weather conditions or shelter is limited
- b. provide extra feed, shelter and shade for sheep after shearing
- c. take steps to reduce rumen and bladder fill prior to shearing
- d. crutch full-fleece ewes if they can not be shorn prior to lambing.

5.5 Hoof Trimming

Hoof care is an important aspect of animal management. Hoof health can affect an animal's performance, disease resistance and welfare. Hooves should be regularly checked for disease and excess growth (46).

Hoof trimming is done:

- to prevent lameness
- to create a flat sole surface, removing trapped mud and feces and reducing the possibility of infection
- to promote proper hoof growth in young animals.

Hoof growth is influenced by both animal factors (e.g. breed, structure and shape of hoof, colour of the hoof) and environmental factors (e.g. soil moisture and characteristics [terrain], diet, housing). The need for and frequency of, hoof trimming will vary depending on the specific conditions.

REQUIREMENTS

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 because of the presence of disease.

RECOMMENDED PRACTICES

- a. avoid hoof trimming immediately before shearing to reduce the chance of injury to sheep and shearers
- b. avoid hoof trimming during periods of stress (e.g. late gestation, hot weather)
- c. trim hooves when they are soft (e.g. due to heavy dew or rain).

5.6 Castration

Ram lambs are normally castrated for management reasons. When male and female lambs are reared together there is a risk of unwanted reproduction (2,47). There is a traditional perception that some consumers find meat from rams less acceptable than meat from wethers due to taint (48). However, there is a growing population of Canadian consumers that prefer meat from intact rams.

Producers should consider carefully whether castration is necessary within any given flock. Castration is unlikely to be necessary where lambs will be finished and sent to slaughter before reaching puberty. The procedure should only be carried out where lambs are not likely to be slaughtered before puberty and where it is necessary to avoid welfare problems associated with intact males. If lambs are likely to be finished in a feedlot they should be castrated at a young age.

All methods of castration at any age cause pain (33). Pain relief reduces the impact of castration on suffering and should be used when and wherever possible.

Drugs effective for pain mitigation in food animals are available in Canada but their use in lambs constitutes an extra-label drug use and these drugs must be prescribed and dispensed by a veterinarian. Desensitization of the scrotum and its contents can be achieved by the use of an injectable local anaesthetic and post-operative analgesia can be achieved when a non-steroidal anti-inflammatory drug (NSAID) is administered at the time of the procedure (49). However, there are a number of challenges in applying anesthesia and analgesia to large numbers of animals in field situations. These challenges include the practical difficulty of safely and effectively administering local anesthesia to lambs in medium to large flocks, the difficulty of using current drug formulations and the reluctance of veterinarians to dispense large volumes of drugs to farmers for extra-label use (46). Notwithstanding these concerns, pain relief reduces the impact of castration on suffering and should be applied whenever it is safe and effective to do so. **Veterinarians must work with sheep producers to develop practical, safe and effective protocols for reducing pain resulting from castration and these protocols should form part of each farm's health and welfare plan.** (See Canadian Veterinary Medical Association [CVMA] position statement on: Castration of Cattle, Sheep and Goats)(50). The sheep industry should work with all relevant stakeholders including the CVMA to address the challenges faced by the industry in applying pain relief to large numbers of animals in field situations.

There are currently three main methods of castration; rubber ring, clamp and surgical. The evidence on the relative severity of pain associated with the different methods of castration is not clear. Producers should discuss the effectiveness and welfare implications of developments in castration technology with their veterinarian. Some interpretations suggest that surgical castration causes more pain and distress than other methods and that the use of a clamp (e.g. burdizzo) causes less pain than other methods (33). With surgical castration there is a risk of hemorrhage, intestinal prolapse and infection.

Castration using rubber rings is acutely painful. The pain associated with the use of rubber rings can be mitigated by any or all of the following (33):

- combining the use of a rubber ring with a clamp
- injecting local anesthesia into the scrotal neck and cord or the testis
- using an analgesic (e.g. non-steroidal anti-inflammatory drugs [NSAID]).

There are advantages to castrating lambs at a young age. Practice shows that young lambs heal faster and demonstrate less disruption in growth. As the lambs age, the size of the scrotum increases and associated structures which when constricted by rubber rings, can give rise to chronic inflammation and pain until healing occurs (49). To minimize disruption of the ewe/lamb bond and to avoid disruption of colostrum intake, it is commonly recommended that lambs not be castrated during the first 24 hours after birth. Castration should be carried out as soon as possible after the lamb is 24 hours old.

Short scrotum castration, a method where the testes are pushed against the body wall and the ring applied below the testes so the scrotum dies and drops off but the testes survive, is not an acceptable practice in Canada. If ram lambs are castrated in this manner, most are infertile, but they still exhibit ram-like behaviours (51) (e.g. riding behaviour and aggression). There is a risk that the ram may be fertile, leading to unwanted reproduction and related welfare concerns.

REQUIREMENTS

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.

All castration must meet the method, age range and pain control use requirements stipulated below in Table 5.1.

Table 5.1: Castration method, age range and pain control use requirements

Method	Age range
Rubber ring (confinement and semi-confinement systems)	24 hours – 10 days
Rubber ring (pasture lambing system*)	24 hours – 6 weeks
Surgical	24 hours – 4 weeks
Burdizzo (clamp)	1 week[^] – 6 weeks
Surgical	Older than 4 weeks, anesthesia and analgesia required
Burdizzo (clamp)	Older than 6 weeks, anesthesia and analgesia required

* Pasture lambing system – refers to large scale systems where ewes are maintained and lamb on pasture or range

[^] Each cord should be crushed separately. Use caution to avoid crushing the boundary between the two sides of the scrotum. Do not crush the septum or tissue between the testicles.

Castration of rams beyond 10 weeks of age must be done by a veterinarian using anesthesia and perioperative analgesia.

RECOMMENDED PRACTICES

- leave ram lambs intact in management systems where rams are weaned early, reared separately, marketed prior to puberty and not sold into feedlots
- avoid castrating lambs on rainy days in pasture situations
- castrating using rubber rings should be performed between 24 hours – 7 days of age
- administer pain relieving drugs (anesthetics and/or analgesics) when and wherever possible
- ensure tetanus vaccinations for ewe flock is up to date
- collaborate with the flock veterinarian to formulate practical, safe and effective protocols for reducing pain resulting from castration and these protocols should form part of each farm's health and welfare plan.

5.7 Tail Docking

Tail docking in sheep is done for health and hygiene reasons (47). Some studies have shown that tail docking can reduce the risk of fly-strike in situations where fly-strike is likely to occur (33). Fly-strike is a risk in most parts of Canada. Docking tails also helps to address food safety concerns, as there is generally a decrease in dag (manure build up) on a docked animal, helping to avoid contact of the meat with bacteria at processing (52).

Tail docking is painful (33). Producers should consider the welfare of the sheep when deciding whether or not to tail dock (52). It is not necessary to tail dock short-tailed breeds and may not be necessary to tail dock breeds with hair (no wool) tails. A contributing factor to the need for tail docking is the lack of access to an approved insecticide with long residual activity to reduce the risk of fly-strike. Pain relief reduces the impact of tail docking on welfare and should be used when and wherever possible.

Drugs effective for pain mitigation in food animals are available in Canada but their use in lambs constitutes an extra-label drug use and these drugs must be prescribed and dispensed by a veterinarian. Desensitization of the tail can be achieved by the use of an injectable local anesthetic and post-operative analgesia can be achieved when a non-steroidal anti-inflammatory drug (NSAID) is administered at the time of the procedure (49). However, there are a number of challenges in applying anesthesia and analgesia to large numbers of animals in field situations. These challenges include the practical difficulty of safely and effectively administering local anesthesia to lambs in medium to large flocks, the difficulty of using current drug formulations and the reluctance of veterinarians to dispense large volumes of drugs to farmers for extra-label use (46). Notwithstanding these concerns, pain relief reduces the impact of tail docking on suffering and should be applied whenever it is safe and effective to do so. **Veterinarians must work with sheep producers to develop practical, safe and effective protocols for reducing pain resulting from tail docking and these protocols should form part of each farm's health and welfare plan.** (See Canadian Veterinary Medical Association [CVMA] position statement on: Pain Control in Animals)(53). The sheep industry should work with all relevant stakeholders including the CVMA to address the challenges faced by the industry in applying pain relief to large numbers of animals in field situations.

There are five main methods for tail docking; hot iron, rubber ring, rubber ring combined with clamp, crush and cut, and surgical method. The evidence on the relative severity of pain associated with various methods of tail docking is not clear. Some research indicates that these pain responses are not as apparent with the hot iron method as compared to rubber ring, rubber ring and clamp, or surgical method (33).

The pain associated with rubber rings can be reduced by (33):

- a. combining the use of a rubber ring with a clamp
- b. using local anesthesia at the site before the rubber ring is applied
- c. using an analgesic (e.g. non-steroidal anti-inflammatory drugs [NSAID]).

Docking a tail too short can lead to more problems than not docking (e.g. increased risk of rectal prolapse and fly-strike). Tail docking at the fourth tail joint causes fewer problems than those that are docked at a shorter length (33).

REQUIREMENTS

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 (e.g using a blade alone) 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. (See Appendix F: Tail Docking).

RECOMMENDED PRACTICES

- a. base the decision to tail dock on a welfare risk/benefit analysis rather than doing out of routine; the basis for this decision should be part of the flock health and welfare plan
- b. tail dock using rubber rings should be performed between 24 hours – 7 days of age
- c. use the hot iron method when and where ever possible
- d. administer pain relieving drugs (anesthetics and/or analgesics) when and where ever possible
- e. consider performing tail docking and castration at the same time.

5.8 Mulesing

Mulesing has never been, nor is currently a practice used in Canadian sheep production. Regardless, mulesing is not acceptable.

REQUIREMENTS

Mulesing must not be performed.

5.9 Dehorning/Horn Trimming

Many of the common breeds raised in Canada are polled, so dehorning is not needed in most circumstances. Dehorning and disbudding are not recommended practices for sheep (54).

For some horned sheep, it may be necessary to trim the tips of the horns to prevent injury from ingrowing horns or interference with sight or normal eating and drinking. The amount of horn trimmed should be kept to a minimum to avoid damage to soft internal horn tissue, which is sensitive and bleeds easily. Consult your veterinarian regarding the choice of an appropriate tool.

In certain circumstances, it may be necessary to trim a substantial portion of the horn, or completely dehorn a sheep. A licensed veterinarian must perform such procedures.

REQUIREMENTS

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.

5.10 Breeding

Sheep are seasonal breeders. The length of the breeding season varies by breed, with photoperiod being the most important contributing factor. The natural breeding seasons generally ranges between August and January, but in some breeds may be considerably longer or year-round. Natural breeding, artificial insemination (AI) and embryo transfer (ET) are breeding methods used; with natural breeding being most common in Canada. There are conventional production systems, where ewes lamb once a year and there are accelerated lambing systems where ewes are bred both within and outside of the normal breeding season so that, in their lifetime, ewes may lamb more frequently than once per year. There are several accelerated systems used in Canada, each resulting in a different lambing interval (55).

Breeding decisions

The management, marketing and breeding objectives of the farm will dictate which breeds are best suited to a particular operation (56). Breeding records are essential to support sound decision making with respect to breeding. Individual sheep identification is important for managing breeding and keeping accurate records. Making responsible mating decisions, considering the ewe and ram genotype, phenotype, and their previous progeny, can help reduce the risk of lambing difficulties due to congenital defects, dystocia due to large lambs and other welfare concerns related to mating of poorly matched animals. Where possible use proven rams known to produce lambs that do not lead to dystocia.

Producers should plan mating periods to ensure the time of lambing suits the production system on the farm, taking into consideration expected weather conditions, available shelter and available labour. In accelerated flocks or those breeding out of season to meet specialized market demands, there are increased demands for sound management and labour; therefore, only experienced producers should consider these types of systems.

Further reading resources include:

- Canadian Sheep Federation's Virtual Toolbox (www.cansheep.ca)
- Ontario Sheep Marketing Agency production manual (www.ontariosheep.org)
- Alberta Lamb Producers production manuals (www.ablamb.ca)
- Le Centre de référence en agriculture et agroalimentaire du Québec Guide: L'élevage du mouton (www.craaq.qc.ca)
- Centre d'expertise en production ovine du Québec (www.cepoq.com)

Ram Management

Ram lambs produce viable sperm and can impregnate ewes from as young as four months of age but in any case by the time they reach 40 to 60% of mature body weight. As with ewes, the breed, season of birth, environment and nutritional status will affect the exact timing of puberty (57). To prevent the negative welfare effects of unplanned matings, it is essential that intact rams and ram lambs are reared separately from ewes and ewe-lambs from the onset of puberty. Rams may display aggressive behaviour with other rams and with stockpeople; avoid housing old and young rams together as older, more dominant rams may injure the lambs. Rams must not be kept visually isolated from other sheep except where it is advantageous for treatment or to limit disease transmission.

Introducing a new ram to the flock requires careful management. Travel and arrival in new surroundings is stressful for rams. New arrivals should be quarantined as part of the farm biosecurity program and to allow them to adjust to the new environment. After the quarantine period, careful management strategies are needed over several days to prevent injury, fighting and aggressive behaviour among rams while they establish a dominance hierarchy (58). Restricting the area rams have available for fighting. Adding objects (e.g. round bales, plastic barrels) to the space can be a useful management strategy to reduce the risks associated with aggressive behaviour.

Further reading resources include:

- Canadian Sheep Federation's Virtual Toolbox (www.cansheep.ca)
- Ontario Sheep Marketing Agency production manual (www.ontariosheep.org)
- Alberta Lamb Producers production manuals (www.ablamb.ca)
- Le Centre de référence en agriculture et agroalimentaire du Québec Guide: L'élevage du mouton. (www.craaq.qc.ca)
- Centre d'expertise en production ovine du Québec (www.cepoq.com)

Controlling estrus

It is sometimes necessary to manipulate the cycle of the ewes so they can breed out of season, or to synchronize estrus. Typical reasons for controlling the estrus cycle include out of season breeding for marketing purposes, breeding in accelerated flocks, or synchronizing when using reproductive technologies for genetic improvement. Little scientific information is available on the welfare implications of estrus control and accelerated lambing.

There are several methods that can be used singly or in combination to stimulate the onset of estrus. Hormones can be administered orally, by injection, or using an intravaginal device. Non-hormonal methods include using the ram effect and photoperiod adjustment. If considering setting up programs for breeding out of season and synchronizing ewes it is essential producers consult with experienced producers and the flock veterinarian about the best practices and the resources required to successfully conduct such a program.

Laparoscopic artificial insemination and embryo transfer are considered surgical procedures and must be performed by a veterinarian.

REQUIREMENTS

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 (human and physical) required before using an accelerated lambing system (e.g. breed selection, maintenance of ewe body condition, care of low birth weight lambs and provision of extra supervision and care).

If performed vasectomies, laparoscopic artificial insemination and embryo transfer, 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 taking into account 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.

5.11 Pregnancy, Lambing and Neonatal Care

Breeding, management and feeding programs that promote unassisted lambing foster animal well-being and reduce the need for help at lambing time (35).

Pregnancy

Adequate nutrition throughout gestation is important to assure proper placental and fetal growth. Balanced nutrition, coupled with proper management during gestation is important for fetal development, lamb vigour and survival at birth. Additionally, proper nutrition during gestation is important to prevent nutritional disorders, which may impact the health and performance of the ewe and her lambs and influences milk production of the ewe (59). (See *Section 3 Feed and Water* for more information on nutrition and body condition). Pregnancy diagnosis using ultrasound is a useful tool for managing the nutrition of pregnant ewes to avoid large single lambs or avoid under feeding ewes pregnant with multiples.

Shearing or crutching ewes with long fleece prior to lambing helps to reduce the risk of disease transmission, improves colostrum consumption and facilitates suckling.

Lambing

The vast majority of lambs are born without incident. However, the welfare of both ewes and lambs can be compromised through difficulty at birth, also known as dystocia. Difficult births can affect the lamb's development in the post-natal period. Following a difficult birth, lambs may be delayed in performing natural behaviours like raising their heads, standing and suckling. Ewes may also have a delay in performing natural behaviours (e.g. standing, grooming the lamb) following a long labour. The risk of dystocia can be influenced by many factors including: breed (ewe and ram), litter size, birthweight, age of the ewe, nutrition during gestation and sex of lambs (in some breeds) (33). Responsible planning and breeding management can help reduce the incidence and severity of dystocia.

Assistance may be required for ewes experiencing a difficult birth. Knowing when and how to provide assistance during lambing is an important management skill. Signs that a ewe may require lambing assistance include (29):

- the ewe has been straining for more than 30-40 minutes without progress
- the water bag is visible and no progress has been made after 30 minutes
- a limb or tail appears alone and no progress is being made after several minutes of straining
- the lamb appears to be stuck. There has been no progress for several minutes since the limbs have appeared
- the head of the fetus is visible with no limbs present
- if the ewe is weak or exhausted.

If lambing indoors, a clean dry area in which to give birth must be provided. (Refer to *Section 2 Facilities* for further reading resources on lambing facility design). In a pasture setting, ewes should be disturbed as little as possible. All lambing should be supervised so problems can be given prompt attention.

Neonatal Care

The starvation-mismothering-exposure complex is a common cause of death in neonatal lambs. These three causes of death can act independently but often there is some association between them (33).

Colostrum intake is essential for the health and well being of all lambs. Lambs are born with very few body reserves and need the high-energy colostrum soon after they are born. Colostrum contains antibodies to help protect the newborns from various diseases. Lambs that do not receive colostrum will generally die (23). The timing of first colostrum is particularly important since the lambs' ability to absorb colostrum is substantially reduced six to eight hours after birth. The ability of the lamb to defend itself against infectious diseases is directly related to the amount, quality and timing of colostrum intake. The result of inadequate colostrum intake is a low concentration of circulating immunoglobulin (Ig) in the blood of a lamb, a condition known as 'failure of passive transfer'.

Maternal (ewe-lamb) bonding is very important for lamb welfare and survival. The behaviour of the ewe before, during and after lambing can affect lamb mortality. Mismothering generally will lead to death of the newborn through starvation. Maternal behaviour may be affected by breed, lambing facility design, stockmanship and management practices on the farm. For lambing in confinement, claiming pens or privacy screens are important for establishing the maternal bond.

Newborn lambs are susceptible to hypothermia especially when still wet from the birthing process. Lamb mortality usually results from exposure and starvation. There are a number of management procedures to reduce the risk of starvation-mismothering-exposure complex. Frostbite is also a risk in extremely cold conditions, plan to mitigate frostbite risk (e.g. extra shelter and bedding). Prompt action is required to prevent lamb mortality.

Newborn lambs are highly susceptible to a number of infectious diseases, including joint ill. Dipping navels can help reduce the risk.

All stockpeople must be able to recognize problems during the perinatal period and know when and how to provide appropriate assistance. Inexperienced stockpeople should seek guidance and training on this topic. Lambing management and neonatal care should be included in flock health and welfare plans. All stockpeople must also be aware of their limitations and seek veterinary advice if uncertain in any way. (See *Appendix G: Lambing and Neonatal Care*).

REQUIREMENTS

During gestation, monitor body condition scores and health on an ongoing basis 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. (See requirements in Section 4.4 Sick, Injured and Cull Animals). 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. (See Appendix G: Lambing and Neonatal Care).

All milk replacers used for lambs four weeks of age or younger must have been formulated for lambs.

RECOMMENDED PRACTICES

- a. scan (ultrasound) females for pregnancy diagnosis at 45-60 days of gestation to better manage pregnant ewes
- b. seek veterinary advice for pain management for obstetrical problems such as dystocia and prolapse
- c. ensure the ewe is capable of producing sufficient high quality colostrum through management of nutrition and udder health during the final 6 weeks of gestation
- d. ensure all stockpeople can palpate udders and identify ewes that have poor udder health
- e. ensure all stockpeople can identify lambs that have not suckled and early signs of hypothermia. Be prepared to implement corrective actions promptly (e.g. have a warming box, stomach tube and supplemental colostrum readily available [60,61], seek expert advice e.g. veterinary or specialist) on appropriate management procedures to (a) reduce the risk of hypothermia and (b) treat hypothermic lambs (see *Appendix G: Lambing and Neonatal Care*).

- f. ensure adequate colostrum consumption, either directly from the ewe or by bottle or tube feeding:
 - i. 50ml per kg of bodyweight within two hours of birth
 - ii. 200ml per kg of bodyweight within the first 24 hours
- g. seek veterinary advice regarding risks associated with supplemental colostrum
- h. treat navels at birth of lambs born in confinement to reduce the risk of joint ill
- i. use claiming pens or privacy screens in indoor systems to allow the maternal bond to be firmly established before the ewe and her lambs are mixed with other ewes and their lambs
- j. euthanize lambs with frostbitten feet
- k. keep mortality records to help identify possible causes and solutions. If newborn lamb mortality is high (>10%) set goals to reduce it by conducting post-mortems, reviewing management procedures in consultation with the flock veterinarian and update the flock health and welfare plan.

5.12 Dairy Sheep – Milking Procedures

Milking management is a critical point on dairy sheep farms. Procedures and time allocated to adaptation to milking machines, training to milking parlour and type of milking (i.e. hand or machine milking), can markedly affect the welfare, health and production performance of dairy sheep. As dairy sheep are highly productive, particular attention must be paid to nutrition during pregnancy and lactation (See *Section 3.1 Nutrition and Feed Management*). Sheep behaviour in the milking parlour is likely to be influenced by both genetic factors and their previous handling experience (62).

The milking system, including milking procedures, udder and milker hygiene, and milking system function are important for the health and welfare of dairy ewes. Sound sanitation practices reduce the risk of environmental mastitis. Malfunction of the milking system, due to incorrect installation, lack of maintenance, or improper use, can cause animal stress during milking and mammary gland diseases. Stray voltage in barns can also cause stress for the sheep. Vacuum level, pulsation and milking units are the main elements of the milking system. They are closely related to each other and influence milk ejection. These three factors must be well balanced, in order to promote welfare of the dairy ewes and optimal functioning of the milking system (60).

REQUIREMENTS

Producers must ensure that milking machines are functioning correctly by carrying out proper maintenance and adjustment of vacuum levels, pulsation rates and ratios, in accordance with the manufacturers' recommendations.

Pens, ramps, milking parlours and milking machines must be suitable for sheep and be inspected and maintained to prevent injury, disease and distress.

To prevent mastitis, proper dairy hygiene must be practiced; before, during and after milking, and must include facilities sanitation.

Milking must be frequent enough to ensure that the ewes are not left with unrelieved, distended udders. Milking should be carried out at least daily.

All stockpeople milking ewes must be competent, or under the direct supervision of a competent milker.

Handling of the ewes must be done in a calm quiet manner to minimize fear.

Stockpeople must develop protocols to train ewes in their first lactation to the system and use patience in their handling.

Ewes under treatment with drugs that require milk withdrawal must continue to be milked regularly.

RECOMMENDED PRACTICES

- a. develop good milking practices including:
 - high standards of hygiene
 - carefully handling teats to avoid injury
 - examining the foremilk for signs of ill health
 - avoiding excessive stripping (63)
 - following a regular routine
 - ensure the interior of the milking parlour is free of protrusions or other hazards and that gates and restraining devices of individual holding units operate safely
 - keep records of udder health problems and treatment, abnormal milk and milk production and quality
 - include a mastitis control strategy in your flock health and welfare plan
 - annual inspection of milking equipment by a qualified person.

5.13 Dairy Sheep – Early Weaning of Lambs

Dairy lambs are either removed from their mothers shortly after colostrum consumption and reared on milk replacer, or are weaned at a later age (usually 30 days).

Dairy sheep producers removing lambs shortly after birth should refer to *Section 3.1.2 Artificial Rearing* for more information.

REQUIREMENTS:

Early weaned lambs (e.g. around 30 days) must be consuming adequate amounts of clean water and solid feed daily to ensure health, growth and vigour.

6

Transportation

Each person responsible for transporting animals in Canada, or arranging for their transport must ensure that the entire transportation process (including loading, transit and unloading) does not cause suffering, injury, or death of the animals.

The federal requirements for animal transport are covered under the *Health of Animals Regulations (Part XII)*. The Canadian Food Inspection Agency (CFIA) enforces them with the assistance of other federal, provincial and territorial authorities. Some provinces also have additional regulations related to animal transport.

Transportation begins with the decision to ship an animal. The producer is responsible for ensuring animals are fit for transport, selecting the mode of transport and selecting a carrier that follows Canada's animal transport requirements.

If you are responsible for transporting animals, you must be familiar with, and follow, Canada's animal transport requirements. If you do not comply with the regulations, you could be fined or prosecuted. If your actions or neglect are considered animal abuse, you could also be charged and convicted under the criminal Code of Canada and/or provincial regulations.

The scope of the sheep Code of Practice ends at the farm gate, but includes requirements and considerations that affect the transportation process. The "Code of Practice – Transportation" should be used as a reference document for the actual transportation process.

6.1 Pre-Transport Decision Making

The responsibility for ensuring that animals are fit for transport lies with the party that is shipping (or causing to be loaded) the animals. To assess fitness for transport those responsible for arranging transport need to be aware of how long the animals may be in transit. If in doubt, assume the longest travel that might occur. Transit time includes intermediate stops, such as auction markets or assembly yards. Those arranging shipping will also need to know whether the transporter needs to provide additional services (e.g. feed, water, rest, milking, etc.) during transit.

Auction markets or collection stations are not considered final destinations. Sheep and lambs shipped off farm may travel through multiple stops for days before reaching a slaughter plant or final destination. Producers need to consider this as part of the fitness assessment for transport and where the final destination may be.

6.1.1 Fitness for Transport

Animals which are to be shipped must be deemed fit for transport.

You must assess and be sure each animal is fit to withstand the stress of the intended journey. **If you are unsure if an animal is fit for the trip**, contact your flock veterinarian or the CFIA before preparing the animal for shipping (62).

There are three categories for defining fitness for transport: **(a) fit**, **(b) unfit** and **(c) compromised**.

- a. A **fit animal** is one that is deemed to be able to withstand the stress of the intended journey and can be transported without experiencing suffering.
- b. An **unfit animal** is one that exhibits signs of infirmity, illness, injury or has a condition that indicates that it cannot be transported without suffering. This includes non-ambulatory. “Non-ambulatory” means unable to stand without assistance or to move without being dragged or carried. Non-ambulatory animals are also called “downers”. (Refer to *Appendix H: Guidelines for Transporting Sheep*).

For examples of conditions that render an animal unfit for transport refer to the transport decision-making tree (Refer to *Appendix H: Guidelines for Transporting Sheep*). On the recommendation of a veterinarian an unfit animal may be transported for veterinary care¹.

For animals that cannot be transported in their current state, you must delay the transport until the animal is fit for the trip, provide appropriate health intervention, or euthanize them. (Refer to *Section 7 Euthanasia*).

Unfit animals include:

- non-ambulatory (downers)
- animals that are extremely thin or weak
- animals that are lame in one or more limbs to the extent that they exhibit signs of pain or suffering and halted movements, or a reluctance to walk, or are lame to the extent that they cannot walk on all four legs
- any animal that would endure unnecessary suffering during the transportation process
- any condition associated with pain that will be aggravated by transport.

For more information refer to: www.inspection.gc.ca

- c. A **compromised animal** is an animal with reduced capacity to withstand transportation. It may exhibit signs of infirmity, injury, or a condition that indicates it has a reduced capacity to withstand transport (65). Sound flock health and management practices (See *Section 4 Health Management*) help to eliminate most cases of compromised animals.

Compromised animals may only be transported with special conditions and provisions that help to prevent injury or suffering.

The following four special provisions must be met when transporting a compromised animal:

- It is transported locally and directly to the nearest suitable place, other than an assembly centre, where it can receive care and attention, or be promptly humanely slaughtered or euthanized;
- It is individually loaded and unloaded without having to negotiate any ramps inside the conveyance;
- It is isolated, or it may be penned with one familiar companion animal. If a sheep needs to be segregated on the load, it must have visual contact with another sheep; and
- Measures are taken that are necessary to prevent the animal’s suffering, injury or death during loading, confinement, transport and unloading.

Note: To prevent suffering, other special provisions, such as additional bedding, may be required, depending on the condition of the compromised animal.

¹ Section 139 (2) in Part XII (Transport of Animals) of the Health of Animals Regulations specifies four conditions when transporting unfit animals for veterinary care (65). Refer to Appendix H: Guidelines for Transporting Sheep.

Always ask a veterinarian if you are unsure about the appropriate special provisions, when moving a compromised animal.

Determining if an animal is fit for transport is the responsibility of the producer. Transporters have the right and legal requirement to refuse to load an animal that they recognize as unfit.

REQUIREMENTS

The fitness for transport of every animal must be evaluated within the context of each trip. (Refer to Appendix H: Guidelines for Transporting Sheep).

Unfit animals must not be transported, except for veterinary treatment or diagnosis and only if special provisions², including the recommendation of a veterinarian, 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. (Refer to Appendix H: Guidelines for Transporting Sheep).

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 transported³.

Neonatal lambs unaccompanied by their dam must not be transported off farm until their navel is healed and they reach seven days of age.^{4,5}

Producers must take expected weather conditions into consideration when making shipping arrangements.

RECOMMENDED PRACTICES

- a. clearly identify and provide documentation for animals that show signs of a previous infirmity/ current health condition at time of loading; for example a veterinary note explaining the condition and treatment given
- b. identify problems early so the animals can be treated or shipped as appropriate, before the condition worsens
- c. respect the health of the national flock by shipping only healthy animals to auction markets, breeding stock sales and livestock sales; avoid shipping animals with infectious conditions
- d. market cull animals from the flock when they are fit
- e. consider that sheep and lambs shipped off farm may travel through multiple stops for days before reaching a slaughter plant or final destination.

² Section 139 (2) in Part XII (Transport of Animals) of the Health of Animals Regulations specify four conditions when transporting unfit animals for veterinary care (65). Refer to Appendix H: Guidelines for Transporting Sheep.

³ Section 136 (1) in Part XII (Transport of Animals) of the Health of Animals Regulations defines animals in the last 10% of gestation as “unfit” (65).

⁴ Section 141 in Part XII (Transport of Animals) of the Health of Animals Regulations mandates conditions that must be followed when livestock of less than 8 days of age are transported (65).

⁵ Section 143 (1) in Part XII (Transport of Animals) of the Health of Animals Regulations limits the time that ruminants that are too young to be fed exclusively on hay and grain can be in transport to a duration of 12 hours (from time loading begins to the time animal is unloaded) (65).

6.1.2 Arranging Transport

Producers are responsible to ensure that the people they are hiring for transporting animals are trained and competent. Each person involved in the handling or transporting of sheep should be properly instructed and be skillful in handling sheep. Employers are responsible for ensuring that personnel directly involved with the transport of sheep are adequately trained and knowledgeable of their care.

REQUIREMENTS

Producers must be familiar with federal and provincial transport regulations.

Producers must ensure that a competent stockperson oversees loading and unloading.

RECOMMENDED PRACTICES

- a. select reputable transporters; follow these guidelines when selecting a carrier:
 - if you have never used a particular transporter before, ask for a list of references that provides information on other sheep and/livestock shippers that have used that carrier
 - make sure the carrier has appropriate experience to address specific needs (e.g. short vs. long distance hauls)
 - does the carrier utilize formal training methods for their drivers in the care, handling and transportation of animals?
- b. train staff in loading and unloading sheep
- c. ensure all required paperwork (e.g. livestock manifests, bills of lading, emergency contact info) is completed and provided to the transporter
- d. ensure loading facilities are compatible with the type of trailer being used by the transporter
- e. ensure the following information is discussed and agreed upon between transporter and shipper (Refer to *Appendix I: Livestock Transport Consignment Form*):
 - number of sheep to be shipped
 - type of sheep (e.g. ewes, rams, lambs, etc.)
 - time and point of loading
 - destination
 - special requirements, if any, of the animals being transported
 - protection for sheep, especially young lambs and freshly shorn sheep, appropriate for the weather conditions. (Refer to *Appendix A: Livestock Safety Index Chart*).

6.1.3 Preparing Sheep for Transport

Management practices focused on meeting the health and welfare needs of the sheep will help ensure animals are fit for transport.

REQUIREMENTS

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 ewes⁶ must be milked out immediately before being transported.

⁶ Section 142 in Part XII (Transport of Animals) of the Health of Animals Regulations specifies conditions that must be met when transporting lactating animals (65). Refer to Appendix H: Guidelines for Transporting Sheep.

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.

RECOMMENDED PRACTICES

- a. ensure all documentation is completed to avoid unnecessary delays at inspections stations or other checkpoints along the way, or for shipments leaving the province or country.

6.2 Loading and Unloading

Loading, unloading can be the most stressful aspects of transport (66). Any efforts by the shipper and the transporter to reduce stress during these times will improve welfare.

Properly designed handling systems and loading ramps help to improve the ease of loading and reduce stress and the chance of injury during loading or unloading. People involved with loading and unloading should have sound knowledge of sheep behaviour and understand how those natural behaviours can be used to assist the loading/unloading process.

REQUIREMENTS

The requirements for loading and unloading procedures and equipment as described in the Health of Animals Regulations must be complied with⁷.

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.

RECOMMENDED PRACTICES

- a. ensure loading areas are uniformly lit, or go from dimmer to brighter lighting but not drastic change; a light in the trailer can help encourage sheep to enter
- b. move sheep in groups appropriately sized for the compartments on the hauler
- c. allow sheep to move at a pace that capitalizes on their strong instinct to follow the leader
- d. load sheep calmly and quietly
- e. consider the appropriate loading densities and the factors that influence densities (e.g. weather, fleece length, length of journey).

⁷ Section 145 in Part XII (Transport of Animals) of the Health of Animals Regulations mandates that a fixed or movable ramp, gangway, chute, step or apparatus used for loading sheep must be used in a manner that is not likely to cause the animal's suffering, injury or death. The following conditions must be met (65):

- it can bear the weight to which it is subjected without collapsing, twisting, breaking or bending;
- it cannot have a slope greater than 35 degrees;
- it has side rails of sufficient strength and height to prevent animals from falling off;
- it is placed so that no unprotected gap exists between the ramp and the vehicle;
- it has a surface that is designed, constructed and maintained to prevent the animal from tripping, slipping and falling.

7

Euthanasia

On-farm euthanasia of animals is necessary when medical care to alleviate pain and suffering is not feasible, or there is no reasonable prospect for recovery.

Education, attitude and behaviour can greatly influence the timeliness, effectiveness and humaneness of the euthanasia procedure. Stockpeople that have received comprehensive training that covers all aspects of euthanasia have greater confidence to make timely decisions on when to euthanize an animal and the skills to perform the procedure competently (29).

7.1 Criteria for Euthanasia (Decision Making)

Comfort and confidence with making decisions about euthanasia can be improved by developing an on-farm euthanasia action plan (protocol).

Euthanasia action plans (67) or protocols for on-farm euthanasia of sheep should be developed in consultation with a veterinarian and include:

- identification of the person(s) that will be performing euthanasia
- euthanasia training
- access to proper and appropriately maintained equipment
- emergency euthanasia in remote locations
- criteria to guide euthanasia decisions:
 - is the animal in pain or distress?
 - is the animal likely to recover?
 - can the sheep be provided with appropriate care (e.g. shelter, food and water)
 - is the animal show clinical signs a reportable disease? (See *Section 4.0 Health Management*).

REQUIREMENTS

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. (Refer to Appendix K: Examples of Decision Tree for Euthanasia).

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). (Refer to Appendix J: Signs of Pain in Sheep, Appendix Lb: Euthanasia Action Plan for Sheep and Goats).

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.

7.2 Methods of Euthanasia

All methods of euthanasia must be quick, cause minimal stress and pain, and result in a rapid loss of consciousness followed by death without the animal regaining consciousness (68).

When choosing a method of euthanasia also consider the following (69):

- human safety
- ability to easily restrain the sheep
- appropriateness for the type of sheep (e.g. animal age, weight or horns)
- degree of difficulty of the procedure
- procedural costs
- emotional effects on the operators or observers
- disposal options.

Table 7.1: Identifies the acceptable methods of euthanasia for sheep

Method of Euthanasia	Suitable for:	Procedure and Equipment
Firearm	All animals	Minimum of .22 caliber firearm using “long-rifle” hollow-nosed ammunition and .22 magnum for horned animals; or shotgun with appropriate ammunition (See <i>Appendix L: Euthanasia</i>)
Penetrating captive bolt* followed by a secondary method	All animals	Restrain if necessary Use appropriate cartridge, charge and bolt length for the animal (Manufacturer’s manual) Accurate marksmanship is critical for ensuring loss of consciousness (See <i>Appendix L: Euthanasia</i>) Confirm insensibility then follow with immediate bleeding out or pithing to ensure death
Non-penetrating captive bolt guns (Controlled blunt force trauma)	Lambs (under 15kg (33lbs. [70])	Confirm insensibility then follow with immediate bleeding out to ensure death
IV Barbiturate overdose	All animals	Must be administered under the direction of veterinarian Restraint if needed Carcass is toxic; safe disposal is required
Blunt force trauma followed by bleeding out	Neonatal lambs up to 5 days of age and under 9kg (20lb.) only	Sufficiently strong blow accurately placed on top or back of the head Palpate or visually confirm the skull is crushed Confirm insensibility then follow with immediate bleeding out to ensure death

* Penetrating captive bolt guns specifically designed for euthanasia are available and should be used according to manufacturer’s instructions

REQUIREMENTS

An acceptable method for euthanizing sheep must be used. (See Table 7.1 and Appendix L: Euthanasia).

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 (i.e. readily available tools or ready access to someone who does).

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. (See Appendix L: Euthanasia).

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.

RECOMMENDED PRACTICES

- a. restrain as necessary for euthanasia; choose the safest and least stressful method of restraint possible
- b. consider, in consultation with a veterinarian, using sedation to help minimize fear (71).

7.3 Confirmation of Death

Death is a process and does not necessarily occur immediately. Acceptable methods either cause immediate death or render the sheep insensible/unconscious, followed by death (29). It is essential that sheep being euthanized are rendered unconscious immediately and remain so until dead.

Indicators of lack of consciousness include:

- lack of corneal reflex
- collapse or lack of attempts to right itself
- lack of coordinated movement
- lack of jaw tone
- lack of rhythmic breathing (gasping is not rhythmic breathing).

The presence of any eye movement or blinking is evidence of regaining consciousness. If any sign of rhythmic breathing, blinking or coordinated movement is detected, the animal is not unconscious. The method must be repeated immediately.

Indicators necessary to confirm death:

- lack of heartbeat
- lack of breathing
- dilated pupils (not to be used as a stand alone indicator).

REQUIREMENTS

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.



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Livestock Safety Index Chart

The Livestock Temperature Humidity Index* (THI Table 1) was introduced by American animal scientists to alert producers of potential heat stress periods for livestock. The THI combines the effects of temperature and humidity into one value. The Livestock Safety Index (LSI) contains three stress categories (temperature given in Celsius [°C]):

- **Livestock Alert** - LSI 24-25.5: when the index reaches this range, heat stress will first appear. Precautionary measures should be taken to reduce heat stress conditions in confinement housing or livestock trailers.
- **Livestock Danger** - LSI of 26-28: an index in this category is dangerous for confined animals.
- **Livestock Emergency** - LSI of 29 or higher: These conditions are most likely to occur when air temperature exceeds 32°C (90°F). No cloud cover and little air movement are additional hazards found in such heat stress weather. Livestock should not be worked or shipped when the index reaches this level.

Table 1: Livestock Temperature Humidity Index* (THI) at specific temperatures and relative humidity levels.

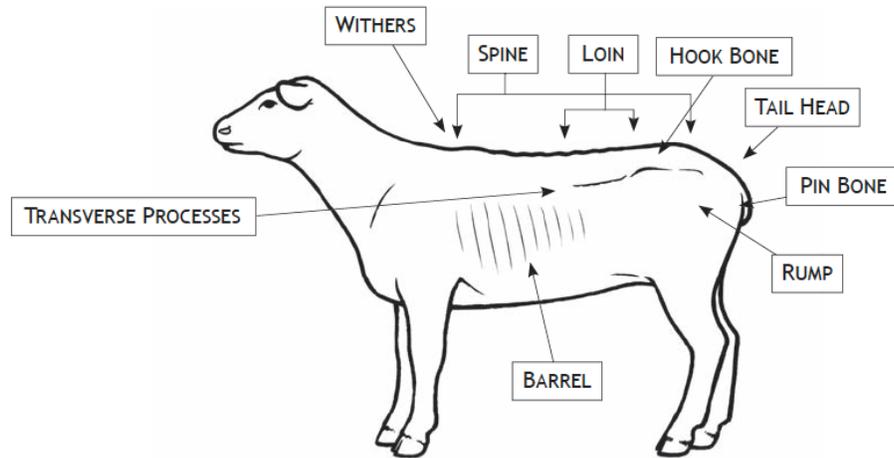
Ambient air		Relative Humidity (%)							
Temp. °F	Temp. °C	20	30	40	50	60	70		
100	37.8	26	29	30	31	33	34		
98	36.7	26	28	29	31	32	33		
96	35.6	26	27	28	30	31	32		
94	34.4	26	27	28	29	31	32		
92	33.3	25	26	27	28	29	30		
90	32.2	25	26	26	27	28	29		
88	31.1	24	24	26	27	27	28		
86	30	23	24	25	26	27	27		
84	28.9	22	23	24	25	26	27		
82	27.8	22	23	23	24	25	26		
80	26.7	21	22	23	23	24	24		
78	25.6	20	21	22	23	23	24		
76	24.4	19	21	21	22	22	23		
Livestock Safety Index (°C)		Normal <23		Alert 24-25.5		Danger 26-28		Emergency >29	

* The Livestock THI was adapted from the human Humidex Chart, which can be found at: www.ccohs.ca/oshanswers/phys_agnets/humidex.html



Body Condition Scoring

Illustration of a sheep with a BCS score of 2.¹



CROSS SECTION OF THE LOIN AREA

BODY CONDITION SCORING OF SHEEP

Throughout the production cycle, sheep producers must know whether or not their sheep are in condition (too thin, too fat, or just right) for the stage of production: breeding, late pregnancy, lactation.

Weight at a given stage of production is the good indicator, but as there is a wide variation in mature size between individuals and breeds, it is extremely difficult to use weight to determine proper condition. Body condition scoring describes the condition of a sheep, is convenient and is much more accurate than a simple eye appraisal.

A body condition score estimates condition of muscling and fat development. Scoring is based on feeling the level of muscling and fat deposition over and around the vertebrae in the loin region (Figures 1-3). In addition to the central spinal column, loin vertebrae have a vertical bone protrusion (spinous process) and a short horizontal protrusion on each side (transverse process). Both of these protrusions are felt and used to assess an individual body condition score.

FIGURE 1

Feel for the spine in the centre of the sheep's back, behind its last rib and in front of its hip bone.

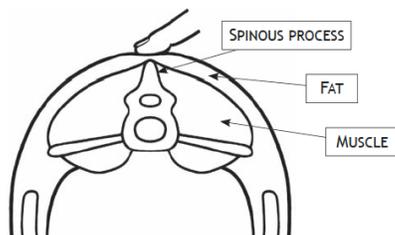


FIGURE 2

Feel for the tips of the transverse processes.

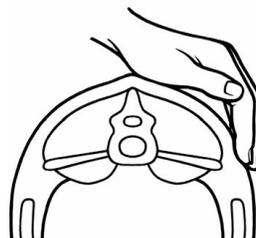
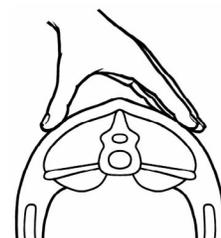


FIGURE 3

Feel for fullness of muscle and fat cover.



¹ The source of the materials is www.agriculture.alberta.ca. The use of these materials by the National Farm Animal Care Council (NFACC) is done without any affiliation with or endorsement by the Government of Alberta. Reliance upon NFACC's use of these materials is at the risk of the end user.



Body Condition Scoring (continued)

BODY CONDITION SCORES FOR SHEEP

Overview of all the body condition scores for Sheep

BCS 1

WHOLE BODY

- Emaciated
- Boney processes can be easily felt

SPINE

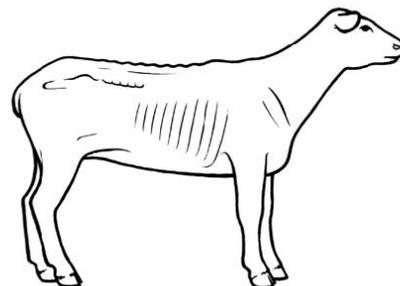
- Dorsal spinous processes are sharp and prominent
- Easily felt through skin

LOIN

- No fat cover
- Loin muscles very shallow

TRANSVERSE PROCESSES

- Transverse processes sharp
- Easy to pass fingers underneath them



BCS 2

WHOLE BODY

- Thin
- More difficult to feel between each process

SPINE

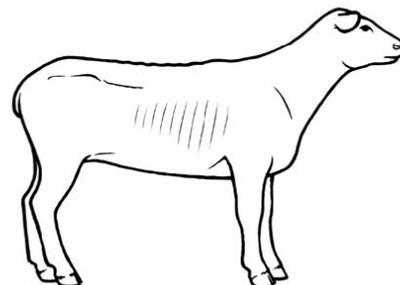
- Dorsal spinous processes still prominent, but not as sharp

LOIN

- Loin eye muscle fuller
- Virtually no fat cover

TRANSVERSE PROCESSES

- Transverse processes rounder on edges
- Slight pressure needed to push underneath them



BCS 3

WHOLE BODY

- Average

SPINE

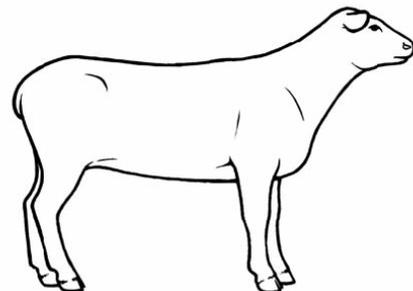
- Spinous processes smoother and less prominent
- Some pressure required to feel between them

LOIN

- Loin muscle full, some fat cover

TRANSVERSE PROCESSES

- Transverse processes smooth
- Firm pressure needed to push fingers under edge





Body Condition Scoring (continued)

BCS 4

WHOLE BODY

- Fat
- Fat accumulations over tail head

SPINE

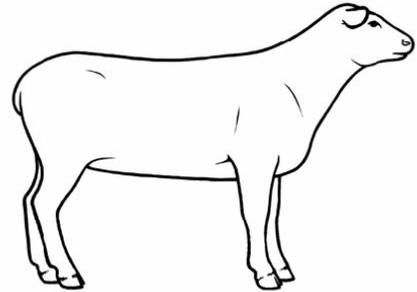
- Considerable pressure needed to feel dorsal spinous

LOIN

- Loin eye muscle full with discernible fat cover

TRANSVERSE PROCESSES

- Transverse processes can't be felt



BCS 5

WHOLE BODY

- Obese
- Fat pad over tail head

SPINE

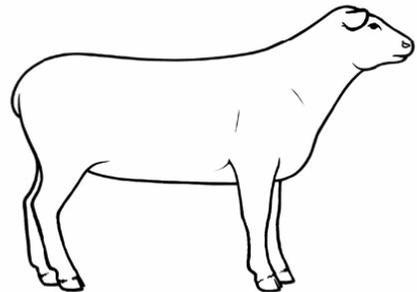
- Dorsal spinous processes can't be felt
- Depression often present where they would normally be felt

LOIN

- Loin eye muscle very full
- Thick covering of fat

TRANSVERSE PROCESSES

- Transverse processes can't be felt



NOTE: There can be extreme differences between breeds when body condition scoring sheep. Some maternal breeds lay down a lot of internal fat, not detectable externally. Whereas, the more muscular, meat terminal breeds can appear to have better condition over the loin area than the less muscular breeds.



Accessing Veterinary Services

Provincial Veterinary Organizations

These veterinary organizations may be able to help you locate veterinarians in your area if you are having finding a flock veterinarian. Some of the websites have search engines where you can search yourself, for others, you will have to call and ask.

College of Veterinarians of British Columbia

Suite 107, 828 Harbourside Drive
North Vancouver, BC V7P 3R9
www.cvbc.ca/cfm/index.cfm
E-mail: reception@cvbc.ca
Telephone: 604-929-7090
Toll free in BC: 800-463-5399
Fax: 604-929-7095

Alberta Veterinary Medical Association (ABVMA)

#950 Weber Centre, 5555 Calgary Trail NW
Edmonton, Alberta T6H 5P9
www.abvma.ca
E-mail: avma@avma.ab.ca
Telephone: 780-489-5007 or toll free 800-404-2862
Fax: 780-484-8311

Saskatchewan Veterinary Medical Association (SVMA)

102 - 108 Research Drive
Saskatoon SK S7N 3R3
www.svma.sk.ca
E-mail: svma@svma.sk.ca
Telephone: 306-955-7862
Fax: 306-975-0623

Manitoba Veterinary Medical Association (MVMA)

6014 Roblin Blvd.
Winnipeg, Manitoba R3R 0H4
www.mvma.ca
General E-mail: adowd@mvma.ca
Telephone: 204-832-1276
Fax: 204-832-1382

College of Veterinarians of Ontario (CVO)

2106 Gordon Street
Guelph, ON N1L 1G6
www.cvo.org
E-mail: inquiries@cvo.org
Telephone: 519-824-5600
Toll free in Ontario 800-424-2856
Fax: 519-824-6497

Ordre des medecins veterinaires du Quebec (OMVQ)

800, avenue Ste-Anne, bureau 200
Saint-Hyacinthe, QC J2S 5G7
www.omvq.qc.ca
E-mail: omvq@omvq.qc.ca
Tel: 450-774-1427
Toll Free: 1-800-267-1427
Fax: 450-774-7635

New Brunswick Veterinary Medical Association (NBVMA)

c/o Dr. George Whittle 1700 Manawagonish Rd.
Saint John, NB E2M 3Y5
www.nbvma-amvnb.ca
Telephone: 506-6351-8100

Nova Scotia Veterinary Medical Association (NSVMA)

15 Cobequid Road
Lower Sackville, Nova Scotia B4C 2M9
www.nsvma.ca
E-mail: info@nsvma.ca
Telephone: 902-865-1876
Fax: 902-865-3759

Licensing Body Newfoundland & Labrador College of Veterinarians

Box 718
Carbonear, NL A1Y 1C2
E-mail: andrewpeacock@gov.nl.ca
Telephone: 709-945-3007
Télécopieur: 709-945-3006

Prince Edward Island Veterinary Medical Association

The Farm Centre Building
420 University Avenue
Charlottetown, PE C1A 7Z5
www.peivma.com
Telephone: 902-569-4343, 902-367-3757
(voicemail)
Fax: 902-569-4563



Individual Examination and First Aid

Examination of the Individual

When health problems are identified and dealt with quickly, they affect fewer animals, decrease losses and reduce suffering. Examination of individual animals is an important adjunct to flock examination. Every stockperson should be capable of examining a sheep to identify important physical abnormalities. In many cases, methodical examination of one or more affected sheep can lead to a tentative diagnosis, or at the very least a short list of differential diagnoses, permitting first aid and development of a plan for further diagnostics, treatment and prevention, in consultation with the flock veterinarian.

It is important to be orderly and consistent when conducting a physical examination. First, observe the animal from afar, noting attitude and awareness of its surroundings, feed and water consumption, gait and posture, and any discharges around head and rear, especially excessive fecal staining of the wool suggesting diarrhea. Count the breaths taken per minute while the animal is undisturbed. Sheep that are disturbed or kept under high ambient temperatures will have higher respiratory rates than normal.

When moving the animal, note its gait and if this sudden activity induces a cough and whether urination and defecation occurs normally. Catch and restrain the sheep only to the degree required to conduct the hands-on part of the examination. Begin by taking the rectal temperature, preferably using a digital thermometer; rectal temperatures up to 40°C are considered in the normal range. While you are waiting, record body condition over the loin and use a hand pressed in the left flank to assess rumen fill and contractions. Assess skin and fleece for abnormalities and infestations; “wool break” indicates stress or disease in the preceding weeks.

Examination:

- Examine the head:
 - check for bottle jaw, enlarged lymph nodes along the jawline, orf lesions and nasal discharge due to respiratory infections
 - assess the teeth for wear and other abnormalities
 - assess the colour of the oral mucous membranes and the conjunctiva (anemia check) and look for deviations of the eye, sunken eyes due to dehydration, or inflammation due to pink eye.
- Assess the character of the breathing use a stethoscope if you have one, or just watch and listen
- Record a heart rate, placing a stethoscope (if you have one) on the area of the chest under the left elbow
- Press and release your fists in the flanks to assess the gut, checking for abnormally sloshy, dry or gassy contents
- Palpate the udder or scrotum for asymmetry, heat, swelling, or scarring
- Check the vulva or prepuce for swelling and unusual discharges and odors
- Check the feet and legs for footrot (trim if necessary to complete your assessment) and other locomotor abnormalities
- When in doubt, compare findings to unaffected sheep in the same group.

Normal ranges for physical examination findings in sheep

Finding	Normal Range
Respiration	20-30 breaths/minute
Heart rate	70-90 beats/minute
Rectal temperature	38.9-40.0°C (average 39.5°C)
Rumen contractions	1-2 contractions/minute



Individual Examination and First Aid (continued)

Handling Disease Outbreaks

- Examine affected individuals
- Retain and chill recent dead animals for post mortem
- Retain the fetus and a portion of placenta from abortions
- Collate numbers affected, assess “risk factors” and call your veterinarian with the information
- Isolate affected animals if there is any chance an infectious agent is involved – biosecurity principles apply
- Consider removing feed if possibly feed-related
- Consider moving sheep elsewhere if toxin could be involved
- Arrange a veterinary visit
- Use mass-medication or vaccination only after veterinary consultation

Flock Medical Emergencies and First Aid

Some conditions are true emergencies and are best dealt with immediately, usually before a veterinarian can attend. Other conditions are straightforward to treat and do not require a veterinarian to attend (e.g. entropion, pink eye, minor wounds). You should have on hand certain medications and equipment for emergency treatment and you should be familiar with the correct methods of administration of these treatments. These standard operating procedures should form part of your flock health plan, which should be developed by you and your veterinarian in the context of a valid veterinary-client-patient relationship.

The following are examples of medical emergencies for which stockpersons should be prepared (knowledge and supplies): fly-strike; rumen overload; hypocalcemia (milk fever); ketosis (pregnancy toxemia); polioencephalomalacia; bloat; water belly (urinary calculi); rectal prolapse; vaginal prolapse; uterine prolapse; and stabilizing fractures.

There are a few things to remember when administering medications: always read the label on any medications; don't mix medications; confirm live weight if possible and dose appropriately; think about withdrawal times before treating and record all treatments. Talk to your veterinarian if extra-label drug use is required. Injecting wet or muddy sheep can be associated with post-injection infections. Needles can be multi-use in some cases (e.g. vaccinating), but replace frequently; always use a clean needle to drawing up drugs or vaccines. Take care with medical waste.



Understanding Sheep Behaviour

Fact Sheet

Introduction to Sheep Handling and Behaviour

Understanding sheep behaviour is the key when handling sheep.

Specific Behaviour Traits

Sheep are created with specific behaviour traits. Knowing what these traits are can make handling them much easier.

- Sheep are social animals, so try and prevent seclusion.
- Sheep by nature are followers; let them follow and don't drive them as you would cattle.
- Sheep are docile animals by nature.
- Sheep have good memories; these memories need to be positive ones as much as possible.

Sheep react to their surroundings, this includes the working environment and facilities; the following suggestions will help make the experience positive:

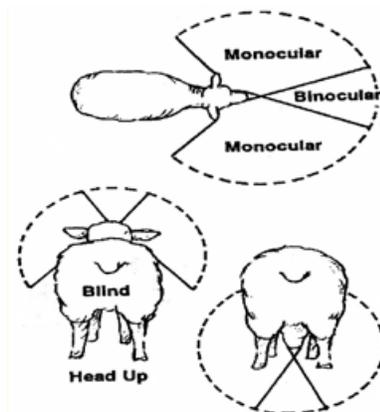
- Sheep like routine, so be patient when introducing something new.
- Sheep reactions are predictable, so use them.
- Sheep react negatively to loud noises and yelling.
- Sheep will bunch up in corners to protect themselves.
- When moving, gathering or sorting sheep, the more efficient the operation the better; wool grabbing and rough handling will cause bruising.
- Sheep tend to move in the opposite direction of the handler.
- Sheep have a flight zone, determine what this is for your flock.
- Sheep move best when not afraid, so work slowly and calmly.
- Sheep do not like to move into the darkness; place a chute facing a well lit area.
- Sheep move better on a flat surface or uphill.
- Sheep will move towards other sheep.
- Sheep will move to a partially full pen.
- Sheep will move better through long, narrow pens and chutes rather than square pens and wide chute systems.
- Sheep resist moving from one type of surface to another.
- Sheep have no depth perception, so shadows, dark surfaces and water are an issue.
- Sheep fear new visual objects.

Sight and Hearing

Sheep and other farm animals have a well developed sense of hearing. They capture a wider frequency of sound than is audible to our ears. Thus it is important while feeding and caring for the animals that you talk to them in a calm, reassuring voice. When they sense that you mean no harm, they will turn to their usual business of eating, drinking and feeding their young.

Humans have binocular vision, focusing both eyes simultaneously to achieve good depth perception and clarity for objects directly in front of them. However humans peripheral vision is very limited. Sheep see the world through a different set of eyes than ours. Sheep have their eyes set on the side of the head. They have a narrow field of binocular vision in front of their head and wide peripheral fields of monocular vision.

The area in the back of the sheep's head is a blind spot when their head is raised. If a sheep is approached from the rear, a handler can remain undetected visually and have a better chance at catching the animal. With its head down in a grazing position the sheep can see in all directions; a good defensive adaptation whereby the sheep can see predators' from all sides while grazing.



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Understanding Sheep Behaviour (continued)

Sheep Behaviour

Moving Sheep

Sheep can be led by shaking a bucket of grain, driven from the rear by a mover, or both with a dog or person to help. When driving sheep use a distracting noise first to alert them. A plastic trash bag, rattle (plastic bottle filled with stones), sticks knocked together or a bark from the dog will get the sheep on their feet and moving away from the noise.

Pressure develops from being too close to the flock of sheep. Use a minimum of noise and pressure so the sheep travel slowly and take a steady course. Sheep have a psychological distance or “flight zone” within which they try to distance themselves from the handler. A safe distance to follow behind the flock is three body lengths (about 10-12 feet) behind the rear of the group.

Sheep at a run are out of control, except over long distance. If they are really frightened they will run away in a panic. When this happens only a swift dog can overtake the leader and turn the sheep around.

Guide the sheep to the pen by moving them at a brisk walk along physical barriers such as a fence line, laneway, the sides of a building etc. Sheep move best on level ground or uphill. Most of their weight is over their rear legs making it awkward to move quickly down hill, especially if the ewes are pregnant. Make sure all the gates are open to the gathering pen. As the sheep approach, ease the pressure on them so they can find their way through the restricted opening.

Holding pens should be rectangular so sheep flow down to one end, rather than square which may start a circular flow around the edges and back out of the pen. Holding pens and catch pens should have open sides so the sheep do not feel trapped. They should be able to see other sheep.

Decoys can be used in this manner to lure sheep into pens or chutes.

Crowd the sheep close in a smaller pen so that the shepherd can handle them easily without them running out of reach. If a small pen is not available, crowd the sheep into the corner of a large pen, using a portable hinged panel to close in the rear of the group. Secure the ends of the hinged panel to the sides of the pen to confine the animals. The crowding area should have corners with no less than a 90 degree angle to keep the sheep in the corners from being crushed or smothered.

A workable group will be up to five sheep deep, and four sheep across (or within arm's length on either side.) Deeper pens of sheep are more difficult to step through, front to back. The sheep should be gathered up tightly, with standing room only and a few feet to spare in the rear for you to work an individual. Sheep are too close together when some are piling on top of each other or the weak ones have dropped down out of sight.

Let the sheep quiet down for five to ten minutes before working them again. When you enter the pen, don't climb over rails, use a gate and enter in a non-threatening manner.

When moving sheep up a loading ramp or down a narrow chute stay approximately 10 feet back from the last sheep to avoid having animals in the rear turn around and run past you. Keeping this distance away from the group gives you time to react to the flow of sheep while still creating some pressure to move the sheep forward.

If sheep become wedged together in a narrow spot, move around the bunch to the front and use noise or visual distraction such as a broom or crook to force the sheep to step backwards. Avoid stepping through the center of the flock because there is no easy escape for you when they free themselves.

Do not move sheep in the heat of the day as they will be slow to gather and suffer from heat exhaustion.

List of Further Reading:

Canadian Agri-Food Research Council, *Recommended Code of Practice for the Care and Handling of Sheep*

Canadian Food Inspection Agency, Livestock Transport Requirements in Canada

Contacts: Agriculture Knowledge Centre

1 - (866) 457-2377 aginfo@gov.sk.ca

Saskatchewan Ministry of Agriculture

Livestock Branch - Regina Rm 202 3085 Albert Avenue
(306) 787-4685 Regina, SK S4S 0B1

Livestock Branch - Saskatoon 3830 Thatcher Avenue
(306) 933-5992 Saskatoon, SK S7K 2H6

Saskatchewan Sheep Development Board
(306) 933-5200 2213C Hanselman Court
sheepdb@sasktel.net Saskatoon, SK S7L 6A8
www.sksheep.com

Disclaimer: The information in this fact sheet are based on general averages and differences may occur among breeds and individual animals. The SSDB makes no warranties expressed or implied about the information. It is the users responsibility to evaluate the accuracy and completeness of any content.



Tail Docking



Photos showing tail being docked at the distal end of the caudal fold

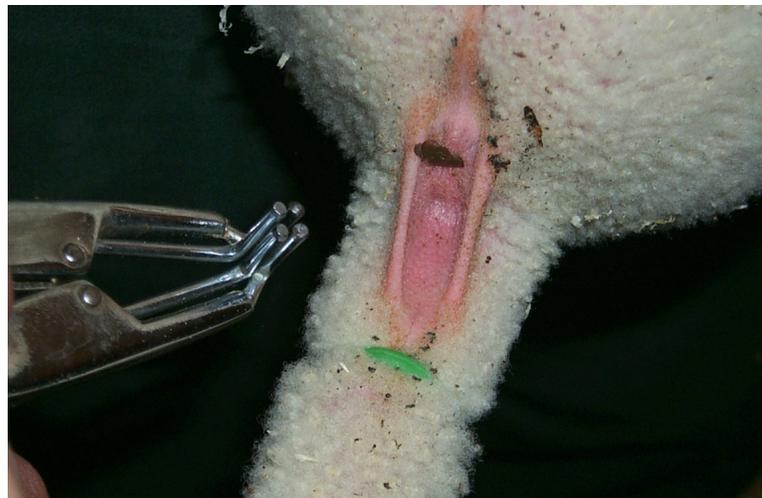


Photo credit to: Dr. Mary C. Smith, Cornell University



Lambing and Neonatal Care

G a: Assisting Ewes at Lambing

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G b: Care of Newborn Lamb

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G c: Treating Hypothermia (Chilling) and Hypoglycemia (Starvation) in Very Young Lambs

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FACTSHEET

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Ministry of Agriculture,
Food and Rural Affairs

ASSISTING THE EWE AT LAMBING

John Martin, Health Management, OMAFRA

This factsheet is one of a set of three, “Assisting the Ewe at Lambing”, “Care of the Newborn Lamb”, and “Treating Hypothermia (Chilling) and Hypoglycemia (Starvation) in Very Young Lambs”, concerning lamb survival. They should be read together.

The ewe's gestation period is from 144 to 151 days, with an average of 147 days. The date that the first lambing is to be expected can be calculated from the date of the first exposure of the ewes to a fertile ram. Before lambing starts, a kit of lambing aids should be prepared. The essentials of this kit are:

- soap
- disinfectant
- obstetrical lubricant
- sterile syringes - 10ml and 1ml
- hypodermic needles of sizes suitable for the ewe and the lamb
- antibiotics and vitamin E/selenium injections
- lambing cords and lamb snare
- navel disinfectant - iodine based
- intra-uterine oblets
- clean towels or cloths
- clean pail for warm water.

Colostrum and milk replacer should also be available. The colostrum can be from ewe or cow, frozen in 500ml units. If lambing is to be inside a building, sufficient individual pens are needed to allow each ewe in the group 2 - 3 days individual housing with her lamb/s.

Signs of impending lambing

About 10 days before the ewe will lamb, the teats begin to feel firm and full of colostrum. Between then and lambing the lips of the vulva slacken and become slightly swollen. In the last hours before lambing, many ewes will separate from the flock. At this point they should be moved into a lambing pen.

At birth, the normal presentation of a lamb is spine upwards, forefeet with the head between them pointing toward the cervix. The cervix, itself, is still sealed by a mucous plug.



Lambing and Neonatal Care (continued)

The lamb is surrounded by two fluid-filled sacs, the allantois and the chorion. These first and second waterbags have acted as cushion to prevent injury to the developing foetus. They form part of the placenta. The placenta is attached to the wall of the ewe's uterus by about eighty small buttons, the cotyledons. It is through these and the placenta that the developing lamb has received nutrients from the ewe's blood supply. The placenta with the cotyledons will be expelled as the afterbirth.

Physiology of Parturition (lambing)

The mechanism by which any mammal gives birth is stimulated by changes to the dams hormone balance and the bulk of the uterine contents, (the foetus and the placental fluids). These stimuli cause the uterus to contract, pushing the foetus into the dilating cervix and expel it.

Lambing

In a normal lambing, there are three distinct stages:

1. *Dilation of the cervix*

As the uterine contractions start, a thick creamy white mucous, the remains of the cervical seal, is passed from the vulva. This is often missed. Continued contractions of the uterus push the first waterbag into the cervix, stimulating its dilation. Eventually the cervix will be about the same diameter as the neck of the uterus. At this time the ewe is uneasy, getting up and down, switching her tail and bleating frequently. There may be some straining. This stage can take 3 - 4 hours.

2. *Expulsion of the lamb*

As the uterine contractions become stronger and more frequent, the lamb and waterbags are pushed into the dilated cervix. The first waterbag bursts, releasing a watery fluid through the vulva. As the ewe continues to strain, the second waterbag is pushed through the vulva and ruptures, to release a thicker fluid.

The rupturing of these bags has established a smooth, well-lubricated passage through the vagina. The hooves and nose of the lamb can often be seen in the second waterbag before it bursts. The ewe continues to strain, gradually expelling the lamb, forefeet first, followed by the head. The ewe may need considerable effort to pass the head and shoulders of the lamb through her pelvis. Once this happened, final delivery is rapid.

The birth of a single lamb should take an hour or less from the rupture of the first waterbag. A ewe, lambing for the first time, or with a multiple birth could take longer.

3. *Expulsion of the afterbirth*

The placenta serves no further function once the lamb has been born, and is passed 2 to 3 hours after delivery has finished. Nothing will be passed until after the first lamb has been born. In multiple births, there will be separate afterbirths for each lamb.

Signs of abnormal deliveries

Most ewes will lamb unaided and about 95% of lambs are born in the normal presentation, forefeet first. A normal delivery usually takes 5 hours from the start of cervical dilation to the delivery of the lamb, 4 hours for the dilation of the cervix and 1 hour for the actual delivery. The first 4 hours often go unnoticed.

If the ewe:

1. continues to strain, but there is no sign of the waterbags, or
2. continues to strain an hour after the rupture of the waterbags but there is no sign of a lamb, or
3. if the lamb appears to be wedged in the birth canal, or



Lambing and Neonatal Care (continued)

- if there is an abnormal presentation, a leg back, head back etc., assistance may be needed. Any delay in assistance could mean the difference between a live and dead lamb.

Making the internal examination

Cleanliness is important to prevent infection of the uterus. Wash the area round the ewe's vulva with soap and a mild disinfectant to remove any manure and other debris. Scrub hands and arms with soap and a mild disinfectant, and lubricated with soap or an obstetrical cream. The hand is carefully slid into the vagina to feel the lamb and assess the situation. Obviously a person with a small hand is best suited for this task.



Normal presentation

In many cases the lamb will be presented normally, you will feel two forelegs with the head between them, in others there will be a malpresentation hindlegs instead of fore legs, or one or both hindlegs back, or a breech presentation, only the tail and rump felt.



One leg back



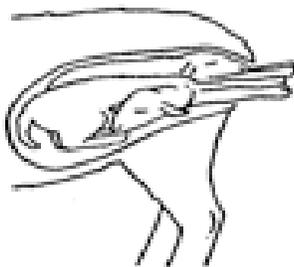
Elbow lock



Both forelegs back



Head back



Four legs - one head



Twins - front and back



**Breech presentation Hind
Legs Only**



Lambing and Neonatal Care (continued)

Resolutions

Normal Presentation - place the noose of a lambing cord over each leg above the fetlock joint and apply a firm steady pull synchronized with the ewe's straining. Lubricate the vagina around the lamb with obstetrical jelly to smooth the passage of the lamb. This is especially important if the waterbags have been ruptured for some time and the vagina has lost this natural lubrication.

Abnormal presentations must be corrected before attempting to pull the lamb. Do not attempt to convert a hind leg presentation to the normal delivery. Pull the lamb out hind legs first, straight back until the lamb's hind legs and pelvis are out of the vulva, then change the pull to downwards towards the ground behind the ewe. Pulling down before the lamb's pelvis is out will wedge the lamb in the pelvic canal of the ewe. Other malpresentations are possible.

Remember that multiple births are common. Two lambs may be presented with legs intertwined. Always ensure that the legs and head are part of the same lamb before attempting to pull it.

Occasionally, deformed lambs will be produced with enlarged heads, stiff joints or skeletal deformities. To successfully lamb a ewe in these situations may require help from an experienced shepherd or veterinarian.

As ewes often have multiple births, the same sequence of the rupture of the waterbag and expulsion of the lamb will be repeated for the delivery of each lamb. After an assisted lambing always check the ewe internally that there is not another lamb to be delivered.

Aftercare

In all cases, whether the delivery was natural or assisted, check that the lamb is breathing, its nostrils are clear of mucous and are not covered by any uterine membrane. At this time the lamb's navel should be disinfected to prevent infection.

The ewe usually starts to lick the lamb, this is a natural process and should be allowed to continue. Some ewes will eat the afterbirth, but this should be prevented as it can lead to digestive disturbance.

A healthy lamb struggles to its feet soon after birth and starts to nurse its dam. Lambs, weak from a protracted delivery should be helped to nurse, or given up to 250ml of colostrum by stomach tube. This first nursing is critical

as the colostrum contains antibodies to give the lamb immediate protection against infectious agents common to the flock. All lambs should nurse or be tube fed colostrum within 6 - 8 hours of birth. In the first 24 hours of life, each lamb should receive about one litre of colostrum. After 36 hours the lamb is unable to absorb any more antibody from the colostrum.

After any assisted delivery the ewe should be given an antibiotic injection and have an antibiotic oblet put into the uterus.

This factsheet was originally written by John Martin is a Veterinary Scientist, Sheep, Goat and Swine, Agriculture and Rural Division, OMAFRA, Fergus.

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Lambing and Neonatal Care (continued)

Appendix Gb: Care of Newborn Lamb

FACTSHEET



ANIMAL
SCIENCE

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Ministry of Agriculture,
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CARE OF THE NEWBORN LAMB

J. Martin

This factsheet is one of a set of three, "Assisting the Ewe at Lambing", "Care of the Newborn Lamb", and "Treating Hypothermia (Chilling) and Hypoglycemia (Starvation) in Very Young Lambs", concerning lamb survival. They should be read together.

The profitability of a sheep enterprise depends on the number of lambs sold either for meat or as breeding stock. The number raised to market is a reflection of the complete management of the flock throughout the year. One of the critical points in this management cycle is lambing.

GESTATION CARE

The ewe is required to deliver strong healthy lambs and to have sufficient milk to raise those lambs. Her ability to do this is a reflection of the gestation management. After breeding a ewe should body score 2.5. Throughout much of the gestation period a diet of good hay should suffice. In the last six weeks, grain can be fed in addition to hay to allow for the growing lambs, the development of the udder, and the fat reserves of the ewe for lactation. The amount of supplementary feed depends on the size and body condition of the ewes and the quality of forage being fed. At lambing the body score should be between 3 and 3.5. Care must be taken not to feed too much grain early in gestation, gradually increasing the amount allows for lamb development. A leveling out or fall in late pregnancy grain intake can result in pregnancy toxemia and death of the lamb(s) in utero. Conversely, too little grain will give an undersized, weak lamb with a poor chance of survival. Also, the ewe will have insufficient udder development for a good lactation.

Not less than four weeks before the due date of the first ewe, all the ewes should receive a booster vaccination against the clostridial group of diseases, (all first lamb ewes should have completed the primary vaccination course before breeding) and an injection of Vitamin E/selenium. If they are not to be sheared, they should at least be crutched to remove excess wool from the udder area.

LAMBING FACILITIES

Each ewe should have a lambing pen in which the bonding between ewe and lamb can be monitored, the lamb is easily caught for any procedures (tail docking etc.), and is seen to be nursing. Depending on the system used, the ewe can be put into this pen when lambing is observed to be imminent, or after the lamb has been dropped. The pen should be about 1.5m square with a corner divided off to give the lamb a safe area from the ewe. Once the lamb is vigorous and all treatments completed, it and the ewe can be let out into a larger pen with other ewe/lamb sets. After each ewe, the soiled bedding is removed and fresh bedding put down. On average, expect each ewe to spend three days in this pen.

LAMBING PREPARATIONS

To be prepared for lambing you will need two kits. One to assist the ewe at lambing (see Assisting the Ewe at Lambing, OMAFRA Factsheet No. 98-091) and the other to process each lamb as it is born.

LAMB PROCESSING KIT

This kit (see Figure 1) should contain:

- suitable syringe and needles
- iodine solution for dipping navels
- Vitamin E/selenium injection
- ear tags and applicators and/or tattooing pliers
- tail docking rings or cutter

LAMBING

The average gestation period for a ewe is 147 days, but some will always be early. Have the kit of lambing aids ready in advance.

The lamb should start breathing at birth. It may need help; check that there is no placenta covering the nostrils or mouth. A gentle rub over the chest with a



Lambing and Neonatal Care (continued)

towel or straw wisk, tickling the inside of the nostrils with a piece of straw or blowing into the nostrils (*do not allow your lips to come in contact with the wet lamb while doing this*) will often stimulate breathing. There is also a commercial device¹ for this task.



Figure 1. Lamb Processing Kit

TINT YOUR LAMBS

In the first few days of a lambs life there are several procedures that should be carried out. Once you are certain that the lamb has had adequate colostrum, TINT them.

- T = Tails
- I = Inject
- N = Navels
- T = Testicles

Tails

The tails need to be docked before the lamb is seven days old. (Code of Practice for Sheep). The tail can be removed with:

- electric or gas heated docker
- rubber ring
- crush and cut device
- rubber ring plus crushing device.

The docked tail should cover the anus of the ram or the vulva of the ewe. A good guide is to remove it at the joint in the tail bones just beyond the web on the underside of the tail.

Injection

In Ontario, newborn lambs can be born selenium deficient. As a routine, they should be injected with the appropriate dose of a Vitamin E/selenium preparation. Read the label on the bottle for the route of injection, either subcutaneous or intramuscular. Always inject into the neck area, never into the muscles of the hind quarters.

¹ Constant Delivery Animal Resuscitator, McCulloch Medical.

Navels

The navel of the new born lamb needs to be disinfected as soon after birth as possible. The untreated navel is an excellent route for infectious agents to enter the lamb causing internal abscessation or joint ill. An iodine solution is the most common disinfectant used. It is either sprayed onto the navel or the navel is dipped in a small container of the solution. If dipping the navels, replace the disinfectant solution in the container after every tenth lamb.

Castration

If the market lambs are to be kept beyond three months of age, they need to be castrated.

Again, whether rubber rings, crushing or cut and pull is used, this should be done before seven days of age. (Code of Practice for Sheep).

Whether tattoos, ear tags, or ear notching is used, the lamb must be identified before it leaves the lambing pen.

FOSTERING

For any one of a variety of reasons, a lamb may need to be fostered onto another ewe. If possible fostering should be considered as an option before bottle feeding for the orphan.

Fostering should be as soon after birth as possible. If the lamb has not dried off, so much the better. If fostering from a set of triplets, choose the strongest lamb. Keep the ewe and the fostered lamb in a lambing pen until you are certain that the adoption has succeeded.

To persuade the ewe to accept the lamb, one of several techniques can be used. Rub the lamb in the placenta of the ewe's own lamb; if you are replacing a dead lamb, put its skin onto the adoptee; if the ewe still refuses, she can be put into a head gate to prevent her pushing the lamb away when it attempts to suckle. After a few days in the headgate, the ewe will usually accept the lamb.

John Martin is a Veterinary Scientist, Sheep, Goat and Swine, Agriculture and Rural Division, OMAFRA, Fergus.

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Lambing and Neonatal Care (continued)

TREATING HYPOTHERMIA (CHILLING) AND HYPOGLYCEMIA (STARVATION) IN VERY YOUNG LAMBS

Items to Have on Hand BEFORE Lambing Begins:

- Digital rectal thermometer to measure subnormal body temperatures (as low as 20°C).
- Frozen colostrum in small batches (150-250 mL or 5-8 oz).
- Lamb stomach tube and feeding syringe (60mL) or squeeze bottle (250 mL).
- Warming box with heater and thermostat.
- Aftercare unit: draft free pens that are warm, dry and well-bedded.
- Bottle of sterile 50% dextrose (500 mL bottle).
- Kettle for boiling water.
- Sterile 60 mL syringe with 20 gauge
- (pink) 1 inch needles.

Recognizing and Treating Hypothermia

The best way to recognize hypothermia is by taking the lamb's rectal temperature and observing its behaviour. The normal temperature of a lamb is 39°C-40°C.

The rectal temperature of any dull, weak lamb that seems unable or unwilling to suckle, should be checked. The SOONER action is taken, the better the lamb's chances of survival.

The basis of treatment of the hypothermic lamb is to warm it up and provide a source of energy to start heat production again.

Symbol definitions: \leq less than or equal to
 $>$ greater than
 $<$ less than

Mild Hypothermia – Any Age

Temperature between 37°C – 39°C

Lamb is weak, depressed, appears empty but can stand.

ACTIONS

- Move lamb into shelter and dry off if wet.
- Feed colostrum by stomach tube (within the first hour of birth is best). Feed 50 mL/kg of bodyweight slowly over 5-10 minutes.
- Additionally feed 200 mL/kg bodyweight spread over three more feedings within the first 24 hours.
- Keep lamb with dam provided she is in a sheltered area.
- ENSURE lamb is nursing.
- Lamb is recovered once rectal temperature returns to normal; lamb and ewe can return to flock.

Small lambs < 1.5 kg (3 lbs) at birth, may not have sufficient fat reserves to initiate heat production, even with colostrum.



ACTIONS

- In addition to colostrum, feed these small lambs an extra 50 mL/kg of a 20% dextrose solution by stomach tube 1 hour after the colostrum feeding.
- For small lambs (under 2 kg), wool pullovers worn for 2 to 4 days, helps to maintain body temperature. These very small lambs may do better in the orphan lamb pen.

Moderate to Severe Hypothermia

Temperature \leq 37°C

How old is the lamb?

Lambs over 5 hours old should be considered hypoglycemic (starved) as well as hypothermic. Do not warm before administering colostrum or glucose.



Can the lamb suckle and swallow?

Lambs with a suckle reflex can be tube fed. Lambs without a suckle reflex will need to be revived using intraperitoneal dextrose and then warmed prior to being tube fed.

If \leq 37°C; < 5 Hrs Old and Suckle Reflex (Able to Swallow)

Lamb is weak, empty, depressed and may be unable to stand.

ACTIONS

- Remove lamb from ewe and dry off if wet.
- Place in warming box until rectal temperature is $>$ 37°C.
- Administer warm colostrum by stomach tube. Feed 50 mL/kg bodyweight.
- Additionally feed 200 mL/kg body weight spread over three more feedings within the first 24 hours.
- Move to hospital pen with heat source and feed until strong and maintaining normal temperature of 39°C.
- Once strong, return to dam but make sure lamb is nursing (identify using livestock paint or marker).

If \leq 37°C; > 5 Hrs Old and Suckle Reflex (Able to Swallow)

Assume that lamb has no fat stores and is hypoglycemic (starved). You must provide an energy source before warming. Lamb is tucked up, empty appearing and depressed.

ACTIONS

- Remove lamb from dam and dry off if wet.
- Administer warm colostrum by stomach tube. Feed 50 mL/kg bodyweight prior to warming!
- If you warm the lamb first, it will convulse and die.
- Place in warming box until rectal temperature is $>$ 37°C.
- Again administer warm colostrum by stomach tube. Feed 50 mL/kg bodyweight. Additionally feed 200 mL/kg bodyweight spread over three more feedings within the first 24 hours.

(Continued)

If \leq 37°C; > 5 Hrs Old and Suckle Reflex Continued

- Move to hospital pen with heat source (e.g. box in warm environment) and feed until strong and maintaining normal temperature (39°C).
- Once strong, return to dam but make sure lamb is nursing (identify using livestock paint or marker).

If \leq 37°C; > 5 Hrs Old and No Suckle Reflex (Not Able to Swallow)

Do not attempt to stomach tube as this will result in the milk / colostrum being deposited in the lungs, which will kill the lamb. Lamb is often unable to stand.

ACTIONS

Reverse the hypoglycemia first before warming or lamb will convulse and die!

- The lamb must first be injected with a sterile solution of warm 20% dextrose at a dose rate of 10 mL/kg body weight into the abdominal cavity (intraperitoneal).

See techniques used to revive hypothermic and hypoglycaemic lambs below.

- Place in warming box until rectal temperature is $>$ 37°C.
- Once revived and with a suckle reflex, administer warm colostrum by stomach tube. Feed 50 mL/kg bodyweight.
- Additionally feed 200 mL/kg bodyweight spread over three more feedings within the first 24 hours.
- Move to hospital pen with heat source (e.g. box in warm environment) and feed until strong and maintaining normal temperature (39°C)
- Once strong, return to dam but make sure lamb is nursing (identify using livestock paint or marker)

As in all conditions, prevention is the best cure for hypothermia. Good nutrition during gestation, good lambing environment, an awareness of weather conditions, observation of the ewe and lamb at lambing, and assisting where necessary, will go a long way to preventing lamb losses from hypothermia.



Lambing and Neonatal Care (continued)

Techniques Used to Revive Hypothermic and Hypoglycemic Lambs

Using a Stomach Tube to Administer Warm Colostrum

- Sit with the lamb restrained on your lap. Measure the tube.
- The tube is passed into the side of the mouth in the space between the front and side teeth.
- Using gentle pressure, the tube is slid into the esophagus and down to the stomach.
- The tube will move easily. ANY resistance or **COUGHING** indicates that the tube has entered the windpipe and it should be removed immediately.
- The accidental passing of colostrum into the lungs will result in aspiration pneumonia and the death of the lamb.
- The esophagus is behind/beside the windpipe on the lamb's left. By placing your fingers on each side of the lamb's throat, you should be able to feel two tubes while sliding the stomach tube in; you will feel the windpipe and the tube passing down the esophagus.
- Slowly administer the warm colostrum either using a 60 mL feeding syringe or a 250 mL squeeze bottle.
- Colostrum should be administered over five minutes.
- Crimp the end of the tube over prior to removing to prevent aspiration.



Sourcing and Warming Colostrum to Feed to Hypothermic Lambs

- Colostrum from a lamb's dam is best, other options listed in order of preference:
1. Individual healthy ewe colostrum from the same flock.
 2. Pooled ewe colostrum from the same flock.
 3. Pooled ewe colostrum from another flock (same disease status or better).
 4. Pooled cow colostrum (use 30% more; feed every five hours in the first 24 hour period).
 5. Any combination of the above.
 6. Commercial colostrum replacement product.

CAUTION
 Johne's Disease can be spread from infected cows and ewes through their colostrum. Use cows from a Johne's tested herd only. Occasionally lambs may develop severe anaemia from cow colostrum. Always identify source of colostrum so problem colostrum can be discarded.



Thaw frozen colostrum in a water bath at 35°C. Never microwave colostrum; it will destroy the proteins, destroying the antibodies in the colostrum.

Administering Dextrose Solution Using an Intraperitoneal (IP) Injection

- With a sterile 60 mL syringe, draw up 20 mL of sterile 50% dextrose using a sterile needle.
- Boil clean water and draw up 30 mL of this water into the same syringe.
- This will provide 50 mL of warm (38°C–40°C) 20% dextrose solution.
- The dose is 10 mL per kg bodyweight; 50 mL is sufficient for a 5 kg lamb.
- The lamb is suspended vertically by the forelimbs.
- The injection site is 2.5 cm (1 in.) below and to the side of the navel.
- Use a 20 gauge (pink) 1 inch needle.
- The needle is inserted at a 45 degree angle to the body wall (the needle is pointed in the direction of the lamb's pelvis). Ask your veterinarian to show you how to do it.
- The internal organs will be pushed away by the needle and not damaged.
- Both the **conscious** and **comatose** lamb can be injected in this manner.



Warming a Hypothermic Lamb Continued

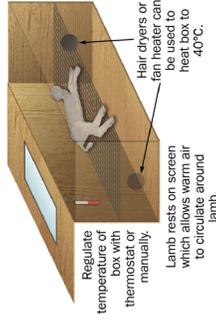
1. A warming box which allows circulation of warm air around the lamb (see diagram below).
2. A water bath warms most quickly but requires holding the lamb to prevent drowning, and immediate drying (towels and hair dryer) to prevent chilling again. This requires the most labour.
3. Heating pad and radiant heat. Both will warm the lamb but there is a risk of burning if used improperly.
4. Heat lamp alone is not recommended as it only warms one side.

Do not warm before administering an energy source (i.p. dextrose or warm colostrum).

Check rectal temperature every 30 minutes to avoid over heating.

A warm air heater is the preferred method.

A warming box can be constructed from cement board and wire mesh. Preferred heat source is a fan heater with thermostat, ideally a ceramic heater (must monitor temperature). A piece of plexiglass in the lid allows for lamb's condition to be monitored.



If temperature 37°C to 39°C

1. A heat lamp can be used to warm the lamb along with warm colostrum.
2. Keep separate from the dam until strong.
3. Suitable containers are disposable cardboard boxes, washable tubs or small pens made with square straw bales.
4. Make sure that can disinfect area if a disease outbreak occurs (e.g. scours)
5. Return to the dam once lamb is strong enough to nurse unaided.
6. Identify the lamb with livestock marker and keep in a small area so can observe easily. Watch for signs of rejection.
7. Lamb may need to be reared artificially if fails to thrive on the ewe.

Warming a Hypothermic Lamb

If temperature ≤ 37°C

Slowly warm the lamb to restore body temperature (until it rises to 37°C). There are several acceptable methods to warm a lamb but some are more effective at increasing temperature.

(Continued)



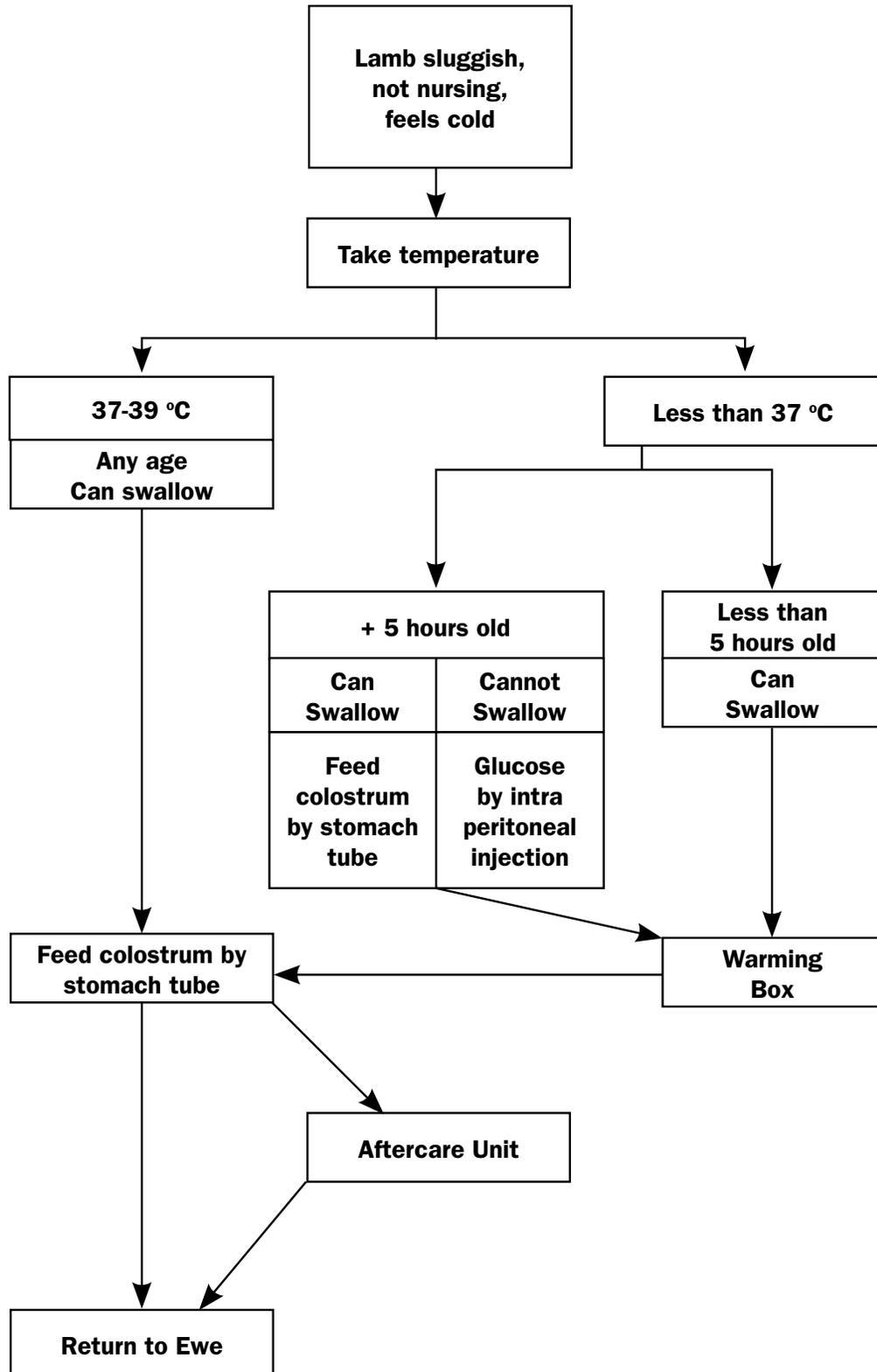
This chart is a summary of the factsheet, *Hypothermia in Newborn Lambs*. Two other factsheets are available concerning lamb survival. *Assisting the Ewe at Lambing and Care of the Newborn Lamb*. Talk to your Veterinarian before lambing season begins. Discuss and review any techniques that you may need to revive chilled lambs.



Ministry of Agriculture,
Food and Rural Affairs

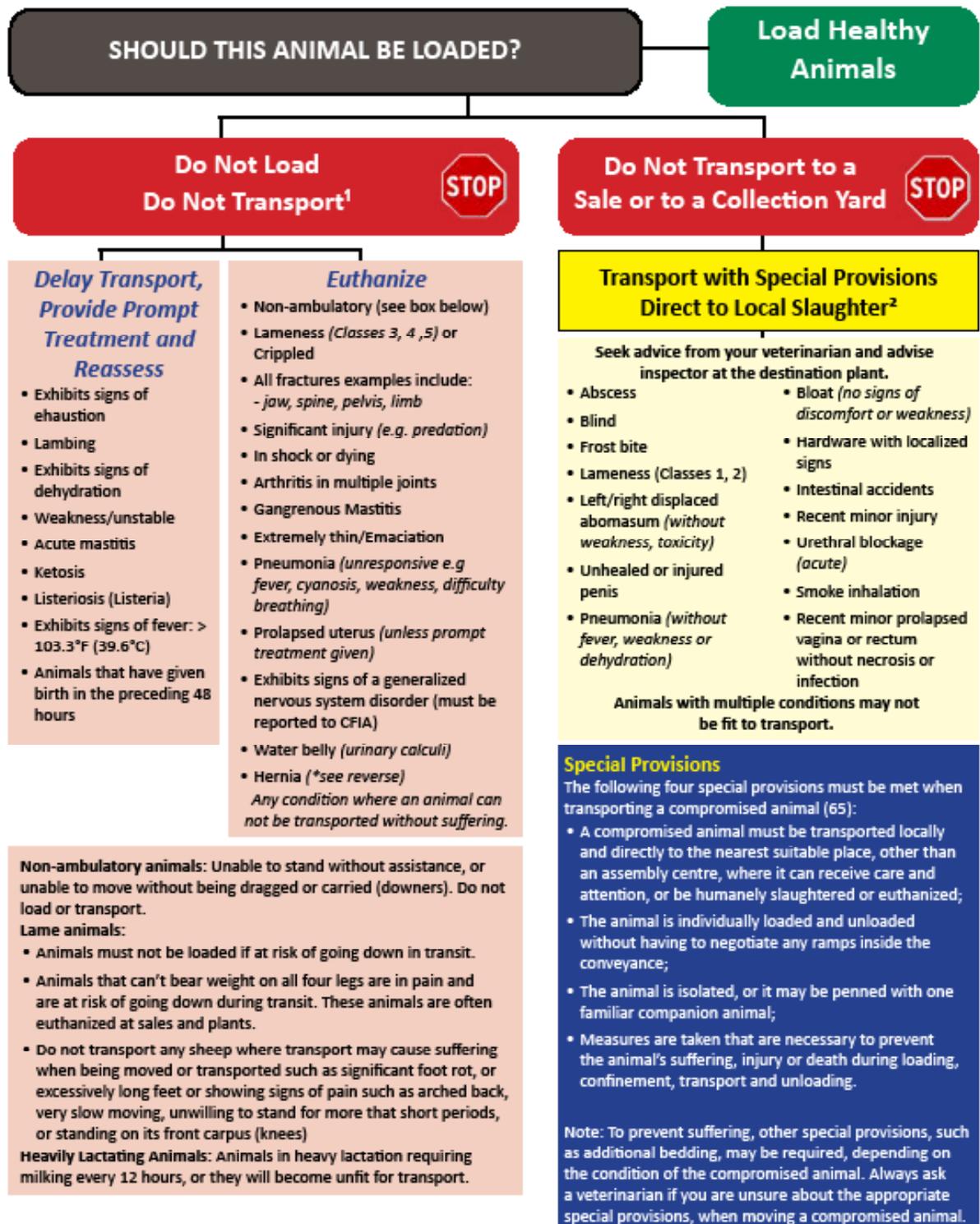


Caring for the Hypothermic Lamb





Guidelines for Transporting Sheep



¹ Section 199 (1) in Part 791 (Transport of Animals) of the Health of Animals Regulations defines "unfit", and includes a list of conditions beyond those listed in this appendix that would render an animal unfit for transport (65).

² Section 199 (1) in Part 791 (Transport of Animals) of the Health of Animals Regulations defines "compromised", and includes a list of conditions beyond those listed in this appendix that would render an animal compromised for transport (65).



Guidelines for Transporting Sheep (continued)

Guidelines for Transporting Sheep

References, but does not exactly replicate Federal Transportation Regulations (2020) Health of Animals Regulations (65)

DO

- Isolate incompatible animals (animals that are likely to suffer, sustain an injury or die if they are confined and transported together).
- Provide proper ventilation, drainage material to absorb and prevent the pooling or escape of water, urine and liquid manure.
- Ensure that the animal is able to stand at all times with all feet on the floor, head elevated with sufficient space to permit a full range of head movement, and without any part of its body coming into contact with a deck, roof or top of the conveyance.
- Spread sand in the vehicle or have vehicle fitted with safe footholds, in addition to appropriate bedding.
- Ensure that animals unloaded for feed, water and rest remain at least eight hours and longer if eight hours is not enough, for all animals to receive food and water.
- Ensure that animals segregated in trucks receive extra protection from cold and wind chill; supply ample bedding.
- Euthanize animals promptly when you identify conditions outlined in the "Should this Animal be Loaded?" chart.

DO NOT

- Transport a sick or injured animal where suffering may result.
- Transport when the animal is in its last 10% of her gestation period, unless under the recommendation of a veterinarian for veterinary care.
- Continue to transport an animal that is injured, becomes ill, or is otherwise unfit to travel beyond the nearest place it can be treated.
- Use electric prods or goads on sheep
- Load or unload animals in a way that would cause injury or suffering.
- Crowd animals to such an extent as to cause injury or suffering.
- Transport livestock in trailers unless they are suited for safe handling of that species or class of livestock.

Lameness Classes

These categories can be used to determine the status of an animal's mobility, from normal to non-ambulatory.

Transport as soon as possible

Class 1

Visibly lame but can keep up with the group; no evidence of pain.

Class 2

Unable to keep up; some difficulty climbing ramps. Load in rear compartment.

Do not Load or Transport*

Class 3

Requires assistance to rise, but can walk freely.

Class 4

Requires assistance to rise; reluctant to walk; halted movement.

Class 5

Unable to rise or remain standing.

* Any animal, including Lameness Classes 3, 4, or 5 may only be transported for veterinary treatment with special provisions*, including the recommendation of a veterinarian.

CFIA Livestock
Emergency
Transport Line
1-877-814-2342
(Ontario only)

Hernias:

Do not transport an animal that has a hernia that meets one or more of the following criteria:

- impedes movement (includes when a hind leg touches the hernia when the animal is walking)
- causes the animal to exhibit signs of pain or suffering
- touches the ground when the animal is standing in its natural position, and/or
- has an open wound, ulceration, or obvious infection.

** This document adapted from *Should this Animal be Loaded? Guidelines for Transporting Cattle, Sheep and Goats* version 05.10

¹ Section 190 (2) in Part XXI (Transport of Animals) of the Health of Animals Regulations mandate that an unfit animal can only be transported directly to a place (other than a slaughter establishment or assembly) owned by a veterinarian if:

- It is to be directly loaded and unloaded without having to negotiate any ramps inside the conveyance;
- It is to be loaded only for treatment and transport;
- Measures are taken to prevent the animal from unnecessary suffering, injury or death during loading, unloading, transport and unloading; and
- A veterinarian recommends that the animal be transported to receive veterinary care.



Livestock Transport Consignment Form

Consignor (Shipper) Information

Business Name (if applicable): _____

Contact Name: _____ Position: _____

Mailing/Billing Address: _____ City/Town: _____ P/C: _____

Carrier (Transporter) Information

Business Name (if applicable): _____

Contact Name: _____ Position: _____

Mailing/Billing Address: _____ City/Town: _____ P/C: _____

Driver Name: _____ Tractor Unit #: _____ Trailer Unit #: _____

Consignment (Load) Information

Date/Time Animals Loaded: _____ Duration of Loading Process (minutes): _____

Point of Origin: _____ City/Town: _____ P/C: _____

Point of Destination: _____ City/Town: _____ P/C: _____

Description of Destination: Intermediate point (e.g. – sales yard) Final point (e.g. – plant, feedlot)

Description of Load (check all that apply): Beef Cattle Dairy Cattle Swine Equine Sheep Goats

Other _____ Weanlings Yearlings Mature (breeding stock) Mature (Cull) Other _____

Animal ID by: Individual Tags Lot #(s) None Head Count _____ Gender: M M (neutered) F Mixed

Average Weight/Animal: _____ lbs or kg Last Fed/Watered at (date/time or # of hours prior to loading) _____

Condition of Animals at loading: _____

Trip Information

Expected Length of Trip (# hours) _____ Expected Delivery Date/Time: _____

Special Requirements during Transit

Feed & Water Rest (unload for 8 hours) Milking Additional Bedding Segregation (describe) _____

Increased Ventilation (hot weather) Reduced Ventilation (cold weather) Other (describe) _____

Special Instructions: _____

Weather Conditions at Time of Loading (Insert temperature and check all that apply):

Temperature (°C) _____ Wind Chill Humid Rain Snow Other precipitation

Potential conditions during transit that could delay shipment (e.g. – extreme weather, road conditions, etc.)

Signature (on behalf of shipper)

Signature (on behalf of carrier)

Date

Courtesy of OTA Livestock Transporters' Division



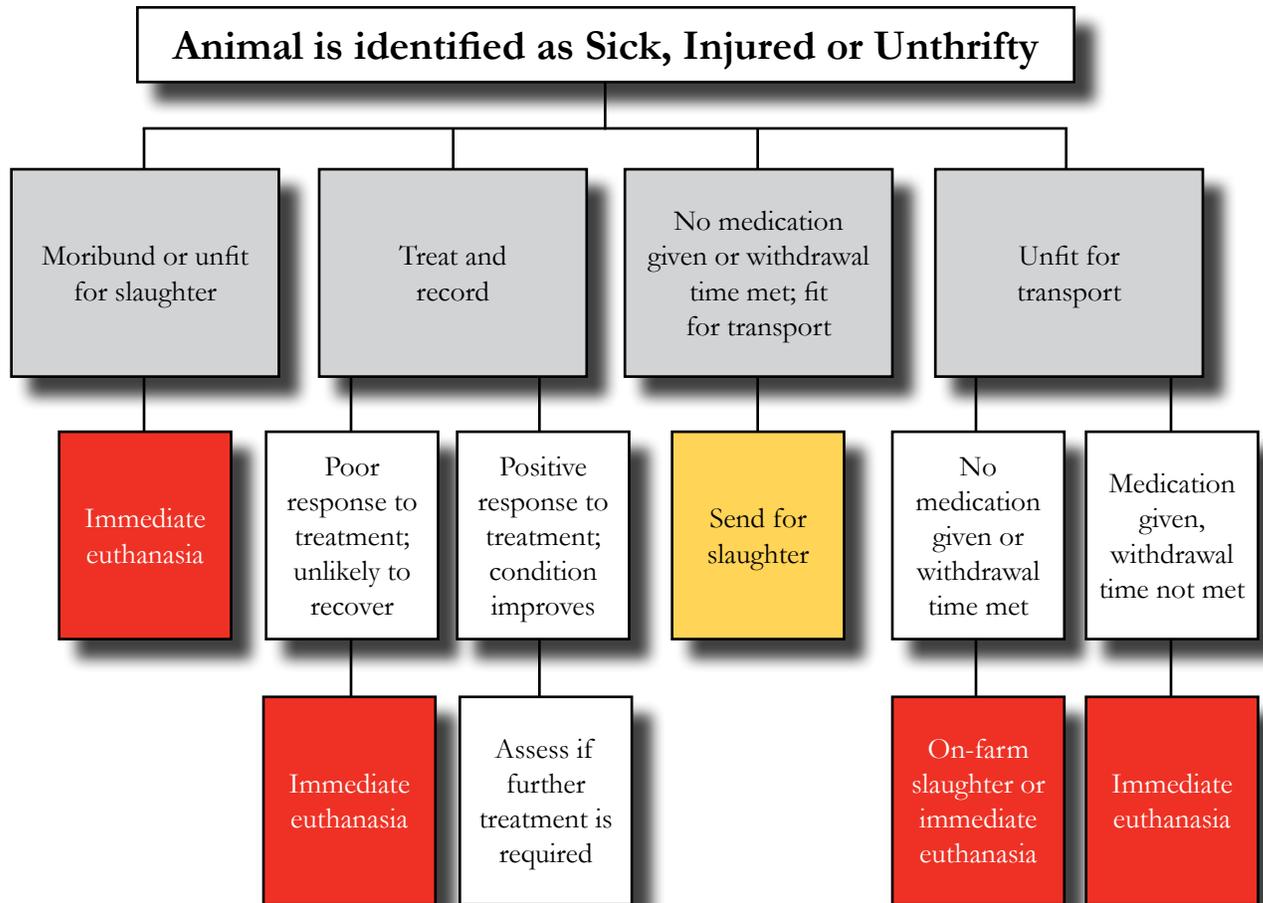
Signs of Pain in Sheep

Sign	Explanation
Guarding	The animal alters its posture to avoid moving or causing contact to a body part (e.g. not allowing lambs to nurse when mastitis occurs).
Abnormal appearance	Obvious changed posture and a changed profile of the body (e.g. arched back) are all observable signs. Dullness.
Altered behaviour	Behaviour may be depressed; animals may remain immobile, or be reluctant to stand or move even when disturbed. They may also exhibit restlessness (e.g. lying down and getting up, shifting weight, circling, or pacing) or disturbed sleeping patterns. They may grunt, grind their teeth, curl their lips, repeated 'yawning', kneeling, altered gait, stomp, kick at their belly, or reluctance to breed (rams). Exhibit rapid and shallow breathing. Animals in pain may also show altered social interactions with others in their group. (e.g. isolated from flock).
Vocalization	Do not tend to vocalize when in pain.
Mutilation	Animals may bite, shake or rub a painful area, wool chewing, scratching or rubbing.
Inappetence	Animals in pain frequently stop eating and drinking, or markedly reduce their intake, rumination may stop.

* Adapted from Recognition and Alleviation of Pain in Laboratory Animals. National Research Council (US) Committee on Recognition and Alleviation of Pain in Laboratory Animals. 2009. Washington (DC): National Academies Press (US) (www.nap.edu/); National Academy of Sciences. Available at: www.ncbi.nlm.nih.gov/books/NBK32656/



Example of Decision Tree for Euthanasia



Examples of criteria for euthanizing sheep

- Weak, unable to stand
- Unable to eat or drink
- Severe injury (e.g. from predator attack)
- Broken leg with exposed bone
- Exposed internal organs
- Moderate to severe lameness
- Rectal or vaginal prolapse (persistent or damaged)
- Severe body weight loss (20% or greater)

Refer to sections 7.0 Euthanasia, 4.4 Sick, Injured or Cull Animals and 6.1.1 Fitness for Transport.



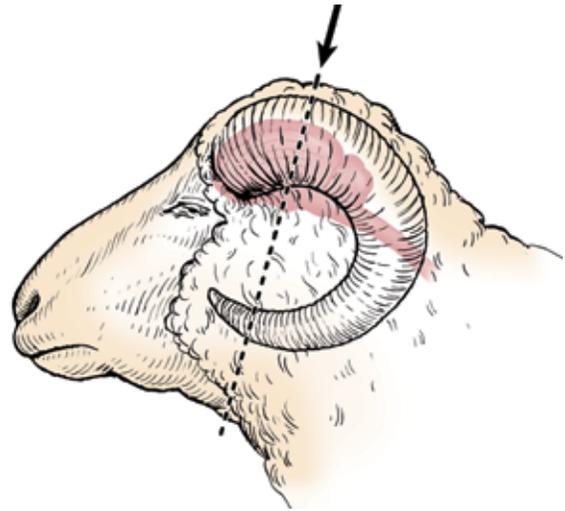
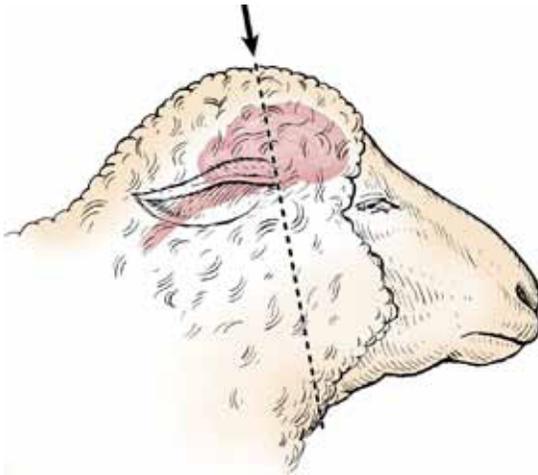
Euthanasia

Appendix L a: Anatomical Landmarks

Location of the brain within the skull of a mature sheep and the correct placement and direction of shot or captive bolt penetration for polled and horned sheep.

Not Between the Eyes!
— but slightly behind the poll or
on the top of the head

**Proper site in horned sheep is
behind the poll as shown**



In horned sheep and rams the top of the head may not be the ideal location because of the thickness of the skull in this region. Instead, an alternate position and orientation for penetrating captive bolt or gunshot in horned animals is on a line from the poll and aimed downward toward the back of the throat. An alternative position for placement of the penetrating captive bolt or firearm in horned animals is the front of the skull directing the bolt or bullet toward the spinal cord.

J.K. Shearer and A. Ramirez, Iowa State University, College of Veterinary Medicine. Reprinted with permission.

See: www.vetmed.iastate.edu/HumaneEuthanasia

Further reading resources for Euthanasia:

Shearer, J. K. 2013. Procedures for Humane Euthanasia Brochure. College of Veterinary Medicine, Iowa State University. Available at: www.vetmed.iastate.edu/HumaneEuthanasia

Ontario Sheep Marketing Agency production manual; Chapter 8 Flock Health and Deadstock.

Available at: www.ontariosheep.org/SHEEPPRODUCTIONINFO/Manuals.aspx

The Humane Slaughter Association out of the UK has some free and downloadable information as well as publications for order on their web-site www.hsa.org.uk/Information/Slaughter/Red%20Meat%20Slaughter.htm

Downloadable documents:

Captive bolt stunning of livestock - www.hsa.org.uk/Web/pages/captiveboltstunningdownload.pdf



Euthanasia (continued)

Appendix L b: Euthanasia Action Plan for Sheep and Goats

Work with your veterinarian to develop a euthanasia action plan appropriate for each species and stage of production on your farm. This plan should be kept in an obvious location in the barn. Review the plan with any new employees and annually with all staff and your veterinarian.

Farm Name: _____

Date: _____ Prepared by: _____

Phase of Production	Euthanasia Method	Alternative Method
Lambs and Kids		
Ewes and Does		
Rams and Bucks		

Important Telephone Numbers:

1. Veterinarian: _____

Phone: _____

After Hours/Emergency: _____

2. Transporter: _____

Phone: _____



Euthanasia (continued)

Appendix L b: Euthanasia Action Plan for Sheep and Goats

Methods of On-farm Euthanasia and their Considerations

Method		Human Safety	Animal Welfare	Skills Required	Cost	Other
Overdose by Barbiturate	Intravenous administration of a barbiturate	Restrain the animal	Excellent rating	Proper technique for intravenous injection	Veterinary fee	Can only be administered by licensed veterinarian
Penetrating Captive Bolt	Penetration of the skull and brain by captive bolt, followed with bleed-out by cutting all the main arteries and veins in the neck	Restrain the animal Be cautious of falling or thrashing animals	Good rating Correct cartridge strength, target site and penetration angle on animal is essential	Correct and safe use of captive bolt pistol Correct and safe use of sharp knife	Low - after purchase of captive bolt pistol	Results in some body movement Results in large volume of blood that requires proper disposal
Gunshot	Penetration of the skull and brain by bullet	Restrain the animal Be cautious of falling or thrashing animals Be extremely cautious about bullet ricochet	Good rating Correct size of firearm and ammunition and correct target site and penetration angle on animal is essential	Correct and safe use of firearm	Low – after purchase of firearm	Results in some body movement and blood Requires firearm acquisition certificate Local by-laws may prohibit the use of firearms

Last updated 2008



Participants

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Role	Committee Member	
Producers	John Hemsted (Chair)	Producer - Central
	Andrew J. Hebda	Producer - Eastern
	Valerie Gerber	Producer - Western
	Brian Greaves	Producer - Canadian Cooperative Wool Growers Ltd.
	Andrew Gordanier	Producer - Dairy
	Chris Eddy	Producer - Feedlot
	Fred Baker	Producer - Central
	Transporter	Randy Scott
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Animal welfare	Carol Morgan, DVM Ph.D.	Canadian Federation of Humane Societies
Animal welfare enforcement	Mike Draper	Ontario Ministry of Agriculture & Food (OMAF) and Ontario Ministry of Rural Affairs (MRA)
Retail and food service organization	Requested but position not filled	
Processor	Randy Smith	Canadian Lamb Producers
Agriculture Canada and/or CFIA	Nicole Cormier, DVM	Canadian Food Inspection Agency
Research/academic	Michael Cockram, B.Vet Med., Ph.D.	International Society for Applied Ethology
	Sébastien Buczinski, Dr Vét, DES, MSc, DACVIM	Faculté de médecine Vétérinaire, Université de Montréal
Technical expertise	Anita O'Brien	Ontario Ministry of Agriculture and Food (OMAF) and Ontario Ministry of Rural Affairs (MRA)

Sheep Scientific Committee Members

Organization	Representative
International Society for Applied Ethology - Canadian region	Michael Cockram, B.Vet.Med., Ph.D. (Chair)
Canadian Society of Animal Science	David Barrett, Ph.D.
Canadian Veterinary Medical Association	Paula Menzies, Dip ECSRHM

Thanks also to: Jennifer McTavish, Barb Caswell and Corlena Patterson - Canadian Sheep Federation, Nadine Meade who served as Code Development Secretary and the reviewer who assisted with translation. The Scientific Committee wishes to acknowledge and thank Brooke Aitken for her work as research writer and the peer reviewers of the Sheep Scientific Committee Report.

The contributions from all participants are greatly appreciated.



Summary of Code Requirements

The following is a list of the Requirements within the sheep Code of Practice. Refer to the cited Code section for further context about the Requirements.

SECTION 1 Environmental Conditions

1.1 Introduction

- Producers must promptly assist individual sheep displaying signs of heat or cold stress.
- Sheep entering the flock that come from a different environment or production system must be monitored closely during the acclimation period and action taken 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.

1.1.1 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 (e.g. allowing access to treed area, bringing in wagons, erecting a canopy, stacking bales)
 - ensuring adequate access to clean, fresh drinking water (demands for water will increase during hot weather (See *Section 3.2 Water*))
 - avoiding the handling and moving of sheep during the heat of the day
 - allowing sheep to rest during the heat of the day (e.g. allow rest breaks as needed if trailing sheep long distances)
 - selecting an appropriate shearing season.

1.1.2 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. Properly designed and maintained hedgerows and windbreaks can be adequate, as can natural land features (e.g. lee side of a hill, bush, gully, coulees) for certain classes of animals.
- Producers must plan the lambing period for the available shelter and to match local climatic conditions (e.g. provide shelter for young lambs and freshly shorn sheep).
- Special considerations for management and shelter during lambing will be required under some conditions. (See *Section 5.11 on Pregnancy, Lambing and Neonatal Care*).
- When planning for extreme weather events and winter management, a producer must consider and be able to:
 - manage their flock to minimize the risk of hypothermia
 - monitor flock closely for signs of cold stress and take immediate action to provide relief if it occurs
 - relocate sheep to a sheltered area or shed
 - provide more feed (energy)
 - provide extra bedding where appropriate
 - manage timing of shearing events to minimize risk of hypothermia (e.g. if bad weather is predicted, make alternate arrangements such as delaying shearing or increasing available shelter).



Summary of Code Requirements (continued)

SECTION 2 Facilities

2.1 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 (e.g. ensure there are no sharp edges and projections that might injure sheep).
- 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. (See also *Section 4.2 Stockmanship Skills Related to Animal Health and Welfare*).
- 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.

2.1.1 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.

2.1.2 Social Environment and Enrichment

- Sheep must have visual contact with other sheep.

2.1.3 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 stockpeople.

2.1.4 Bedding and Manure Management

- Bedding must be provided in all buildings used for rearing sheep, with the exception of systems using slotted floors.
- Bedding must be clean and dry.
- Sheep must not be housed on solid concrete floors without providing adequate bedding.



Summary of Code Requirements (continued)

- 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.

SECTION 3 Feed and Water

3.1 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.
- With the exception of 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. (See also *Section 4.4 Sick, Injured or Cull Animals*).
- 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 (e.g. weeds toxic to sheep, lead batteries, fertilizer, treated seed, antifreeze, nitrates) and to feed with physical qualities (e.g. awns) that could cause injury or limit intake.

3.1.2 Artificial Rearing

- Newborn lambs that are taken from their dams must receive colostrum within six hours of birth. (See also *Section 5.11 Pregnancy, Lambing and Neonatal Care*).
- 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.

3.2 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.



Summary of Code Requirements (continued)

- Snow is acceptable as a sole water source for the breeding flock if:
 - it provides sufficient water each day to satisfy their water intake needs
 - the sheep do not show signs of dehydration
 - the sheep are gradually acclimated early in the cold season
 - the sheep are healthy, non-lactating and maintain a good body condition i.e. a score of 3 or higher
 - feed intakes remain at levels that promote health and welfare
 - the sheep have the physical ability to move to clean snow and eat it
 - the snow is not hard packed, trampled or soiled
 - all sheep, their environment and snow conditions are monitored daily and
 - a back-up water source can be made available without delay, either by moving the sheep to an area with a source of water or by hauling water if the snow source becomes unsuitable because of trampling, soiling or winter thaws etc.
- 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.

SECTION 4 Health Management

4.1 Relationship of Animal Health to Animal Welfare

- Keep accurate and detailed animal health records.

4.2 Stockmanship Skills Related to Animal Health and Welfare

- All people working with sheep must have access to a copy of this Code.
- Producers must have the resources for and knowledge of the basics of care as stated in this Code and ensure such care is provided.
- Stockpeople must be familiar with and provide the basics of care as stated in this Code.
- 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 this Code.
- The frequency of inspection will depend on factors that affect sheep welfare at any particular time, such as housing, lambing, predation, fly-strike, introduction of new sheep and adverse weather conditions and must be at least daily.



Summary of Code Requirements (continued)

4.3 Veterinary Care and Flock Management Programs

- All producers must have a valid veterinary-client-patient relationship (VCPR) with a licensed veterinarian. (See *Appendix C: Accessing Veterinary Services*).
- Producers must have a flock health and welfare plan.

4.4 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.
- Surgeries other than those referenced in *Section 5 Husbandry Practices* and first aid, must be performed by a licensed veterinarian.
- 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.

4.4.1 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 based on:
 - predisposing environmental factors
 - predisposing sheep traits
 - relative risk factors (dags and long tails; wet wool in warm, humid conditions; footrot, open wounds)
 - the seasonal presence of blowflies.
- Producers must take steps to reduce the attraction of flies to sheep:
 - consider the risk of fly-strike in the risk/benefit analysis when deciding to tail dock (Refer to *Section 5.7 Tail Docking* for more information)
 - preventing diarrhea or treating it quickly if cases do occur and crutching accordingly
 - cleaning and treating wounds quickly
 - shearing animals before fly season.
- Monitor flock for fly-strike as soon as fly season begins and during prolonged damp and humid weather.

4.4.2 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; work with the flock veterinarian to develop a control strategy tailored to the farm location and management.
- Parasite control and treatment strategies for tapeworms (i.e. *Cysticercus ovis*) in dogs must be developed and implemented on farm.



Summary of Code Requirements (continued)

4.4.3 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 (see *Section 6.1.1 Fitness for Transport*), euthanized or under the direct care of a veterinarian.

SECTION 5 Husbandry Practices

5.1 Handling, Grouping and Moving Animals

- All stockpeople must be competent in sheep handling techniques and have an understanding of sheep behaviour, or be under the direct supervision of an experienced stockperson.
- Stockpeople must work calmly and quietly with sheep at all times; this includes minimizing noise (e.g. from people, herding dogs and equipment) as much as possible.
- Plan procedures to minimize the frequency, duration and degree of restraint.
- Sheep must be handled at all times in such a way as to minimize the risk of pain, injury, or distress. For example sheep must not be:
 - dragged or lifted by the fleece, tail, legs, ears, neck or horns
 - grabbed by the fleece
 - held on their side or back for more than a few minutes at a time especially if the rumen is full or if they are heavily pregnant.
- Electric prods are ineffective and must not be used on sheep.
- Mistreating animals is unacceptable. This includes, but is not limited to: kicking, striking, slamming gates on sheep.
- 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.

5.2 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 the minimum of handling stress.
- Proper restraint that is appropriate for the size of the sheep must be used when tagging, notching or tattooing.
- For permanent identification methods, it is important to practice good hygiene because the skin on the ear will be broken. Ensure the applicators, ears and the stockperson's hands are clean and dry before the procedure.
- Producers must ensure applicators are sharp and that all related equipment is in good working order and maintained according to the manufacturer's instructions.



Summary of Code Requirements (continued)

- When using tags:
 - use a tag suitable for the age, size and breed of sheep
 - use two tags maximum per ear to avoid interfering with the ear's natural position
 - ensure the tag is positioned correctly (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.
- Producers must ensure all identification requirements (i.e., Canadian Sheep Identification Program (CSIP), export requirements) are met for all sheep leaving the farm.

5.3 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. (See *Section 4.4 Sick, Injured or Cull Animals* and *Section 7 Euthanasia* for more information).

5.4 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 (e.g. hypothermia, sunburn, biting insects, health problems).

5.5 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 because of the presence of disease.

5.6 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.



Summary of Code Requirements (continued)

- 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.
- All castration must meet the method, age range and pain control use requirements stipulated below in Table 5.1.

Table 5.1: Castration method, age range and pain control use requirements

Method	Age range
Rubber ring (confinement and semi-confinement systems)	24 hours - 10 days
Rubber ring (pasture lambing system*)	24 hours - 6 weeks
Surgical	24 hours - 4 weeks
Burdizzo (clamp)	1 week [^] - 6 weeks
Surgical	Older than 4 weeks, anesthesia and analgesia required
Burdizzo (clamp)	Older than 6 weeks, anesthesia and analgesia required

* Pasture lambing system – refers to large scale systems where ewes are maintained and lamb on pasture or range

[^] Each cord should be crushed separately. Use caution to avoid crushing the boundary between the two sides of the scrotum. Do not crush the septum or tissue between the testicles.

- Castration of rams beyond 10 weeks of age must be done by a veterinarian using anesthesia and perioperative analgesia.

5.7 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 (e.g using a blade alone) 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. (See *Appendix F: Tail Docking*).

5.8 Mulesing

- Mulesing must not be performed.



Summary of Code Requirements (continued)

5.9 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.

5.10 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 (human and physical) required before using an accelerated lambing system (e.g. breed selection, maintenance of ewe body condition, care of low birth weight lambs and provision of extra supervision and care).
- If performed vasectomies, laparoscopic artificial insemination and embryo transfer, are considered surgical procedures and must be done by a veterinarian.
- Electroejaculation is a procedure that must only be performed by a veterinarian.
- Rams must be managed taking into account 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.

5.11 Pregnancy, Lambing and Neonatal Care

- During gestation, monitor body condition scores and health on an ongoing basis 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. (See requirements in *Section 4.4 Sick, Injured and Cull Animals*). 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.



Summary of Code Requirements (continued)

- 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. (See *Appendix G: Lambing and Neonatal Care*).
- All milk replacers used for lambs four weeks of age or younger must have been formulated for lambs.

5.12 Dairy Sheep – Milking Procedures

- Producers must ensure that milking machines are functioning correctly by carrying out proper maintenance and adjustment of vacuum levels, pulsation rates and ratios, in accordance with the manufacturers' recommendations.
- Pens, ramps, milking parlours and milking machines must be suitable for sheep and be inspected and maintained to prevent injury, disease and distress.
- To prevent mastitis, proper dairy hygiene must be practiced; before, during and after milking, and must include facilities sanitation.
- Milking must be frequent enough to ensure that the ewes are not left with unrelieved, distended udders. Milking should be carried out at least daily.
- All stockpeople milking ewes must be competent, or under the direct supervision of a competent milker.
- Handling of the ewes must be done in a calm quiet manner to minimize fear.
- Stockpeople must develop protocols to train ewes in their first lactation to the system and use patience in their handling.
- Ewes under treatment with drugs that require milk withdrawal must continue to be milked regularly.

5.13 Dairy Sheep – Early Weaning of Lambs

- Early weaned lambs (e.g. around 30 days) must be consuming adequate amounts of clean water and solid feed daily to ensure health, growth and vigour.

SECTION 6 Transportation

6.1.1 Fitness for transport

- The fitness for transport of every animal must be evaluated within the context of each trip. (Refer to *Appendix H: Guidelines for Transporting Sheep*).
- Unfit animals must not be transported, except for veterinary treatment or diagnosis and only if special provisions¹, including the recommendation of a veterinarian 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. (Refer to *Appendix H: Guidelines for Transporting Sheep*).
- 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 transported².
- Neonatal lambs unaccompanied by their dam must not be transported off farm until their navel is healed and they reach seven days of age^{3,4}.

¹ Section 139 (2) in Part XII (Transport of Animals) of the Health of Animals Regulations specify four conditions when transporting unfit animals for veterinary care (65). Refer to Appendix H: Guidelines for Transporting Sheep.

² Section 136 (1) in Part XII (Transport of Animals) of the Health of Animals Regulations defines animals in the last 10% of gestation as "unfit" (65).

³ Section 141 in Part XII (Transport of Animals) of the Health of Animals Regulations mandates conditions that must be followed when livestock of less than 8 days of age are transported (65).

⁴ Section 143 (1) in Part XII (Transport of Animals) of the Health of Animals Regulations limits the time that ruminants that are too young to be fed exclusively on hay and grain can be in transport to a duration of 12 hours (from time loading begins to the time animal is unloaded) (65).



Summary of Code Requirements (continued)

- Producers must take expected weather conditions into consideration when making shipping arrangements.

6.1.2 Arranging Transport

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

6.1.3 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 ewes⁵ 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.

6.2 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.

SECTION 7 Euthanasia

7.1 Criteria for Euthanasia (Decision Making)

- 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. (Refer to *Appendix K: Example of Decision Tree for Euthanasia*).
- 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). (Refer to *Appendix J: Signs of Pain in Sheep*, *Appendix Lb: Euthanasia Action Plan for Sheep and Goats*).
- 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.

⁵ Section 142 in Part XII (Transport of Animals) of the Health of Animals Regulations specifies conditions that must be met when transporting lactating animals (65). Refer to Appendix H: Guidelines for Transporting Sheep.

⁶ Section 145 in Part XII (Transport of Animals) of the Health of Animals Regulations mandates that a fixed or movable ramp, gangway, chute, step or apparatus used for loading sheep must be used in a manner that is not likely to cause the animal's suffering, injury or death. The following conditions must be met (65):

- it can bear the weight to which it is subjected without collapsing, twisting, breaking or bending;
- it cannot have a slope greater than 35 degrees;
- it has side rails of sufficient strength and height to prevent animals from falling off;
- it is placed so that no unprotected gap exists between the ramp and the vehicle;
- it has a surface that is designed, constructed and maintained to prevent the animal from tripping, slipping and falling.



Summary of Code Requirements (continued)

7.2 Methods of Euthanasia

- An acceptable method for euthanizing sheep must be used. (See Table 7.1 and *Appendix L: Euthanasia*).
- 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 (i.e. readily available tools or ready access to someone who does).
- 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. (See *Appendix L: Euthanasia*).
- 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.

7.3 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.

