



National Farm Animal Care Council

CODE OF PRACTICE FOR THE
CARE AND HANDLING OF SHEEP

DRAFT VERSION

Table of Contents

Introduction	5
Chapter 1 Personnel, Training, and Responsibilities	7
Chapter 2 Emergency Preparedness and Management	8
Chapter 3 Environmental Conditions	10
3.1 Introduction	10
3.1.1 High Temperature, and Humidity, and Provision of Shade	11
3.1.2 Provision of Shelter during Cold and Windy, and Cold and Wet Conditions	12
Chapter 4 Facilities	14
4.1 Housing and Handling for all Sheep	14
4.1.1 Social Environment and Enrichment	17
4.1.2 Outdoor Facilities - Grazing and Pasture Fencing	17
4.1.3 Temperature, Humidity and Air Quality	18
4.1.4 Bedding and Manure Management	19
4.1.5 Lighting	20
Chapter 5 Feed and Water	21
5.1 Nutrition and Feed Management	21
5.1.1 Colostrum Consumption	22
5.1.2 Artificial Rearing	22
5.2 Water	23
Chapter 6 Health Management	26
6.1 Relationship of Animal Health to Animal Welfare	26
6.2 Veterinary Care and Flock Management Programs	26
6.3 Sick, Injured or Cull Animals	28
6.3.1 Parasite Control	29
6.3.2 Blowfly-Strike	30
6.3.3 Lameness	31
Chapter 7 Husbandry	32
7.1 Handling, Grouping and Moving Animals	32
7.2 Identification	33
7.3 Predation Management	34
7.4 Shearing and Crutching	36
7.5 Hoof Trimming	38
7.6 Castration and Tail Docking	38
7.7 Mulesing	41
7.8 Dehorning/Horn Trimming	41
7.9 Breeding	41

7.10	Pregnancy, Lambing, and Neonatal Care	43
7.11	Dairy Sheep – Milking Procedures.....	46
7.12	Dairy Sheep – Early Weaning of Lambs	47
7.13	Managing Deadstock.....	47
Chapter 8	<i>Preparations for Transport.....</i>	49
8.1	Introduction	49
8.2	Pre-Transport Planning.....	49
8.2.1	Assessing Risk Factors	50
8.2.2	Assessing the Sheep’s Capacity to Withstand a Journey	50
8.2.3	Arranging Transport and Communicating Relevant Transport Information to Support Proper Planning 51	
8.3	Shipping and receiving sheep.....	52
8.3.1	Personnel and movement of sheep	52
8.3.2	Loading and Unloading Areas.....	53
8.3.3	Basic Principles for the Transport of Sheep.....	53
8.4	Shipping Sheep.....	54
8.4.1	Compromised and Unfit Sheep	54
8.4.2	Preparation of Sheep Prior to Loading.....	56
8.4.3	Loading into Conveyance	57
8.4.4	Unloading on Farm or Feedlot.....	57
Chapter 9	<i>Euthanasia</i>	59
9.1	Criteria for Euthanasia (Decision Making)	59
9.2	Methods of Euthanasia	60
9.3	Confirmation of Loss of Sensibility and Death.....	63
Chapter 10	<i>On-farm Slaughter</i>	65
References		66
Appendix A: Sample Welfare Policy		72
Appendix B: Evacuate or Shelter in Place		73
Appendix C: Sample Emergency Telephone List.....		74
Appendix D: Mapping Barns and Surrounding Areas for Fire Services		75
Appendix E: Heat Stress Factors.....		76
Appendix F: Livestock Safety Index		77
Appendix G: Panting Index.....		78
Appendix H: Body Condition Scoring		79
Appendix I: Accessing Veterinary Services.....		83
Appendix J: Euthanasia Decision Tree		84
Appendix K: Signs of Illness, Injury, and/or Pain in Sheep.....		85

<i>Appendix L: Individual Examination and First Aid</i>	<i>89</i>
<i>Appendix M: Training Materials and Tools for Sheep Locomotion Scoring</i>	<i>91</i>
<i>Appendix N: Understanding Sheep Behaviour</i>	<i>92</i>
<i>Appendix O: Dock Smart – Cover What Matters</i>	<i>94</i>
<i>Appendix P: Lambing and Neonatal Care.....</i>	<i>95</i>
<i>Appendix Q: Guidance for Transporting Sheep</i>	<i>105</i>
<i>Appendix R: Sample On Farm Euthanasia Plan</i>	<i>106</i>
<i>Appendix S: Anatomical Landmarks for Euthanasia.....</i>	<i>107</i>

DRAFT

Introduction

This is the second iteration of the Code of Practice for the Care and Handling of Sheep developed and released using the National Farm Animal Care Council process and replaces the version published in 2013.

In Canada, sheep and lambs are kept on some 14,000 premises and managed in a wide variety of production systems that vary with local climate, topography, vegetation and type of sheep. Individual production systems include but are not limited to total confinement, seasonal confinement, extensive range grazing, pasture-based systems where sheep are seldom if ever housed, feedlots, island grazing, sheep dairies, lifestyle properties, small privately owned petting farms, zoos, and sanctuary/animal rescue sites. This Code establishes the minimum standards of care for all production systems regardless of location or type.

The developers of this Code considered newly available information in areas such as pain control and mitigation, for example, and have made appropriate science informed adjustments throughout the updated Code.

There are three new chapters in this Code:

1. All competencies, knowledge and abilities required by owner/operators, employees and family members to maintain the health and welfare of the sheep in their care, according to the Code, are gathered into one chapter. New entrants into the industry must ensure that they have the required knowledge and skill to manage the health and welfare of their sheep before they acquire their first flock and avail themselves of training opportunities, knowledge from a mentor and/or information from provincial sheep associations.
2. A new chapter provides helpful guidance on emergency preparedness and disaster planning to help producers provide the best outcome for their sheep when potential climatic or disaster events disrupt sheep care and management routines.
3. Lastly, recognizing that some provinces and jurisdictions allow on-farm slaughter of sheep and lambs for human consumption, this Code provides best welfare practices during the conversion to food.

This Code is not intended to be a production manual or to comprehensively describe all production and management practices. Its focus is on providing good welfare outcomes for sheep and lambs during all stages of production. Where producers need them, there are many excellent sheep production manuals available to producers from commercial publishers, extension offices and provincial sheep associations.

As a species, sheep and lambs are able to experience both positive and negative states and will show signs of fear, hunger, thirst and excitement depending on what is happening in their immediate environment. It is to producers benefit to provide sheep and lambs with more positive welfare experiences than negative, as well cared for sheep are more productive and profitable. This code recognizes that there is more than one way to provide good welfare for sheep and lambs.

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

This Code provides guidance for the care and handling of sheep and does not supersede applicable federal or provincial legislation. Causing unnecessary pain, suffering, or injury, or allowing animals to be in distress due to neglect, is prohibited under the Criminal Code of Canada and most provincial legislation. Concerns

regarding animal neglect or cruelty should be addressed promptly through education or by contacting the appropriate industry organization or animal welfare authority.

Lastly, the volunteer work of a diverse group of individuals that includes sheep farmers, veterinarians, animal welfare advocates, animal welfare enforcement and government representatives in developing this Code, through many hours of meetings and discussions, needs to be recognized and appreciated.

DRAFT

Chapter 1 Personnel, Training, and Responsibilities

The care and management provided by people have a direct and significant impact on the health and welfare of sheep. Producers and managers set the tone for animal care on the farm.

A written animal welfare policy can be an effective way to demonstrate a commitment to good welfare and responsible care. A welfare policy (see Appendix A: Sample Welfare Policy) can outline this commitment and how it will be met, including:

- providing sheep with sufficient balanced ration to meet their nutritional needs
- providing access to clean and palatable water to satisfy their water intake needs
- providing shelter and conditions that keep sheep comfortable and safe
- promoting good health
- handling and managing sheep calmly in ways that work with their behaviour and social nature
- providing comfortable places to rest
- providing opportunities to engage in activities such as grazing, exploring, and seeking shelter.

All personnel involved in the care and handling of sheep require the knowledge, skills, and judgment to carry out their responsibilities. This includes an understanding of sheep behaviour, basic needs, and the ability to recognize and respond to changes that may affect welfare.

Ongoing learning supports continuous improvement in animal care. Personnel are encouraged to build their knowledge and skills, and to seek guidance from experienced individuals, advisors, or veterinarians when additional support is needed.

REQUIREMENTS

Producers must develop an animal welfare policy that demonstrates a commitment to promoting good welfare and responsible care of sheep in accordance with this Code (see Appendix A: Sample Welfare Policy).

Producers must ensure that personnel are trained, supervised, and provided with the resources necessary to carry out their responsibilities in accordance with this Code.

All personnel working with sheep must be competent to perform their assigned duties or be under the direct supervision of a competent person.

All personnel must have knowledge of sheep behaviour, basic needs, and indicators of good health and welfare, and be able to recognize changes in behaviour or condition and take timely and appropriate action.

Personnel performing higher-risk or specialized tasks (e.g., lambing assistance, tail docking, castration, euthanasia, or other procedures requiring technical skill) must have demonstrated competency in the required techniques, including the correct use, maintenance, and sanitation of equipment, or must perform these tasks under the direct supervision of a competent person.

RECOMMENDED PRACTICES

- a. prepare a written welfare policy (see Appendix A: Sample Welfare Policy).

Chapter 2 Emergency Preparedness and Management

Effective emergency preparedness and management are essential for safeguarding sheep welfare by ensuring timely and appropriate responses to potential emergencies.

Natural disasters and emergencies may arise and compromise sheep welfare such as extreme weather, natural disasters, power failures, barn fires, disruption of supplies, or collapsed barns.

The purpose of emergency management is to prioritize human safety, while addressing the safety of livestock, protecting property, and then reducing economic losses. Emergency management is comprised of four interdependent components (47):

- **Prevention and Mitigation** - to eliminate or reduce the risks of an emergency before it occurs.
- **Preparedness** - to be ready to respond to an emergency and manage disaster consequences through steps taken prior to an event, such as developing plans, agreements, and training.
- **Emergency Response** - to act immediately before, during or after an emergency to manage its consequences.
- **Disaster Recovery** - to repair or restore conditions to an acceptable level after a disaster. There is a strong relationship between sustainable recovery and the mitigation of future disasters.

Planning is key for minimizing the impact should an emergency occur.

The main pieces of an emergency preparedness plan should include:

- Premise and producer information (farm name, location, premise ID, directions, phone numbers, names and contact info for anyone residing on the premises, etc.)
- Emergency contact list (local, provincial, federal agencies, veterinarians, neighbours, industry groups, insurance agent, etc.)
- Site map (showing locations of buildings, livestock, hazardous materials, safety equipment, farm boundaries, water sources, etc.)
- Factors for deciding to shelter in place or evacuate the livestock
- Specific plans of action for different types of emergencies.

Provincial and territorial emergency management organizations (EMOs) are a good source of information about how to prepare for emergencies in your region. EMOs activities include planning and research, training, response operations and the administration and delivery of disaster financial assistance programs. EMOs are most familiar with the natural hazards and other risks of your region.

Learn more from the EMO in your province or territory:

<https://www.canada.ca/en/services/policing/emergencies/preparedness/get-prepared/emergency-planning-resources/emergency-management-organizations.html>

One of the biggest considerations when emergency strikes is whether to shelter in place or relocate livestock. See Appendix B: Evacuate or Shelter in Place for more information on shelter in place or relocate.

Releasing animals into unfenced areas or onto roadways can be hazardous.

It is important to recognize that animal behaviour may change in the face of an emergency. Their response may vary and may be atypical. For example, prey animals may refuse to leave shelters because they are familiar, safe places.

An emergency plan helps inform others on how best to assist during an emergency, including family members, employees, neighbours, and first responders.

Do not assume that everyone knows what to do in the case of emergencies (55). Practicing emergency scenarios is important to ensure that people (including children) respond calmly and automatically in potentially panic-inducing situations.

REQUIREMENTS

Every farm must have a written emergency preparedness plan accessible at the onset of an emergency. At a minimum the plan must include:

- **Identified list of risks**
- **Emergency contact list (see Appendix C: Sample Emergency Telephone List)**
- **Site map identifying: feed, water, fuel, power, hazards in the area (chemical stores, wells, etc.). See Appendix D: Mapping Barns and Surrounding Areas for Fire Services.**
- **Arrangements or contacts for evacuation – transporters and pre-identified site (rodeo grounds, fairgrounds, buddy farm)**
- **Passwords for critical systems (cell phones might burn or be lost)**
- **Documented procedures with actions and designated people.**

All employees and family members must know where the plan is located.

RECOMMENDED PRACTICES

- a. ensure that stockpeople and family member training includes an annual review of the emergency procedures
- b. consider emergency management protocols when designing or renovating facilities (e.g., rapid evacuation of livestock, installation of fire alarms, emergency lighting).

Chapter 3 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.

3.1 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, newborn/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.

All sheep must have access to a well-drained or elevated lying area. Constantly standing in wet conditions is not acceptable.

RECOMMENDED PRACTICES

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

3.1.1 High Temperature, and Humidity, and Provision of Shade

Sheep are susceptible to heat stress (see Appendix E: Heat Stress Factors). When ambient temperature exceeds body temperature, sheep experience difficulty dissipating body heat through normal physiological functions. High humidity levels will further complicate heat dissipation (see Appendix F: Livestock Safety Index).

Sheep will change or adapt their behaviour to maximize heat loss. These changes can be used together with panting assessment to assess the impact of heat on the animals.

Signs that may be seen in sheep as they are progressively exposed to heat conditions include:

- shade seeking
- increased standing
- decreased dry matter intake
- crowding of water troughs
- increased water intake
- bunching to seek shade from other sheep
- changes to, or increased, respiratory rate (see Appendix G: Panting Index)
- immobility or staggering.

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.

It is important to monitor for signs of heat stress in the flock; means of mitigating heat stress include:

- monitoring frequently for individual animals showing signs of heat stress (see Appendix G: Panting Index)
- providing shade (e.g. allowing access to treed area, bringing in wagons, erecting a canopy, stacking bales). Shaded areas must have adequate airflow
- ensuring adequate access to clean, fresh drinking water (demands for water will increase during hot weather; see Section 5.2 Water)

- avoiding the handling and moving of sheep during the heat of the day
- selecting an appropriate shearing schedule for the breed, management system, climate and weather conditions. Fleece can play a role in protecting from radiant heat and sunburn
- monitor shaded areas and take action if manure accumulation is deterring sheep from using shade or contributing to heat stress.

REQUIREMENTS

Producers must plan for elevated heat conditions and take steps to mitigate heat stress in all geographical and topographical areas.

RECOMMENDED PRACTICES

- consult a veterinarian to establish a protocol for treatment options for sheep showing signs of hyperthermia and include this in the flock health and welfare plan.

3.1.2 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.

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.

When conditions are adverse for the sheep they may (5):

- face away from the prevailing winds
- seek shelter from the wind
- huddle together
- shift positions within the group
- hunch
- shift weight between feet.

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 (building, shed, or portable shelter), 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. tree lines, bales, 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 7.10 on Pregnancy, Lambing and Neonatal Care).

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

- manage 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 a more energy-dense feed
- 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.

Chapter 4 Facilities

4.1 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.

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 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. Finished weight of market lambs should be considered when calculating stocking densities in pens, otherwise stocking densities should be adjusted as they grow. Maintaining a dry, clean, and comfortable lying area for the sheep is essential to promote good welfare.

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 (4). 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 5.2 Water.

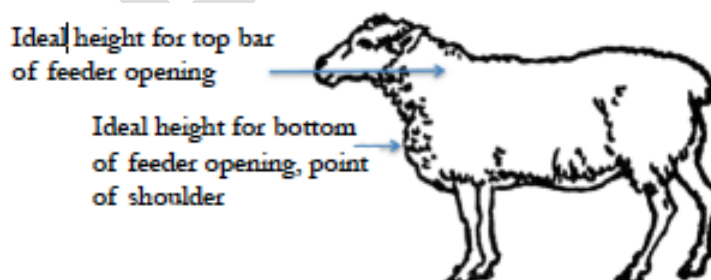


Figure 4.1 Ideal dimensions for the feeder openings relative to size of sheep; feeder openings in these positions will allow sheep to eat comfortably and top bar will prevent sheep from climbing into feeder.

Table 4.1 shows the minimum recommended floor space requirements for sheep. Table 4.2 below shows recommended minimum feed space allotments.

Table 4.1 Minimum recommended floor space requirements for sheep.

	Ewes or Rams	Feeder Lambs
Feedlot m ² /head (ft ² /head)		
Hard surfaced	1.4 (1.6)	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)	2.7 m (9 ft)	2.7 m (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 4.2 Recommended minimum feed space allotments. Linear space needs to be adjusted for larger or smaller sheep and degree of fleece cover.

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

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 (5).

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

Equipment and fencing/penning must be suitable for the type of sheep.

Limit-fed sheep must all be able to access the feed at the same time.

Corrective action must be taken if competition for feed is limiting access for some sheep even in free-access systems.

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 1 Personnel, Training, and Responsibilities).

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 7.1 Handling, Grouping and Moving Animals).

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 clean and dry lying area.

RECOMMENDED PRACTICES

- a. consider the amount of space and layout needed for ease of movement of sheep and equipment when designing and setting up facilities
- b. consider biosecurity when designing and managing animal facilities
- c. plan exit doors for emergencies and to provide protection from snow/ice slides from roofing
- d. consider alleyways and movement pathways within structures
- e. construct internal surfaces of housing and pens of materials which can be cleansed and disinfected or be easily replaced when necessary
- f. consider housing and feeding needs when developing on-farm emergency plans.

4.1.1 Social Environment and Enrichment

Sheep are social animals (9). 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 (10) 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 (11, 12). 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 (13). Although there is limited information on the provision of enrichment devices and procedures, they can be beneficial in some circumstances (14).

Providing visual contact with other sheep is essential to avoid isolation stress (15).

REQUIREMENTS

Sheep must have visual contact with other sheep or another compatible animal, except where it is advantageous for treatment or to limit disease transmission.

4.1.2 Outdoor Facilities - Grazing and Pasture Fencing

Secure and robust fencing limits injury or escape. No single fence design is suitable for all landscapes, site conditions, or containment requirements.

For sheep contained with fencing, it is important that it is strong and well-maintained to reduce the risk of sheep leaving the property and possible subsequent injury (e.g. road accident, predation).

In situations where fencing is not used, measures to protect the sheep from roaming in unsafe areas or trespassing onto land or fields of others should still be enacted to protect the sheep and respect the neighboring lands and properties from injury and damage.

REQUIREMENTS

Containment methods must be sufficient to ensure safety for the sheep.

There must be no sharp edges or protrusions (e.g., tail-end of the barbed wire) in fencing or in pasture that could injure the sheep.

Electric fences must be installed according to the manufacturer's specifications. All power units for electric fences must be designed to prevent short circuits and/or stray voltage.

Electric fences must be tested for proper voltage and grounding.

Scrub and weeds must be cleared from around electrified strands.

RECOMMENDED PRACTICES

- a. ensure that fencing is low to the ground to prevent animals from escaping, but tall enough to prevent predators from entering

- b. facilities should be designed to contain the animals living there and to stop them from encroaching/ trespassing on other land based on regional bylaws/ regulations.

4.1.3 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 (6).

In confinement operations, ventilation systems ensuring adequate airflow to avoid excessive heat buildup 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 3.1.2 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 7.10 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 (7). 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 (8). 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.

Corrective action must be taken if ammonia is either detected by smell or if levels exceed 25 ppm.

Shelter must ensure adequate airflow and protection from prevailing 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. check for drafts at animal level and adjust ventilation to eliminate drafts at animal level.

4.1.4 Bedding and Manure Management

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

Bedding provides warmth, insulation and comfort for sheep (17). 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 (see Section 7.10 Pregnancy, Lambing, and Neonatal Care, for more information).

Manure and waste present 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.

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.

With regard to bedding requirements for lambing, refer to Section 7.10 Pregnancy, Lambing and Neonatal Care.

RECOMMENDED PRACTICES

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

4.1.5 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 (16).

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

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

Chapter 5 Feed and Water

5.1 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. 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. 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 (18). On-farm husbandry and management directly influence body condition; therefore, BCS 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. Target BCS will vary depending upon stage of production (Table 5.1 and Appendix H: Body Condition Scoring). BCS 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 BCS are most applicable to mature sheep and may be of little use for lambs under 6 months of age.

Table 5.1 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 BCS stated for each stage of production*
- *Ewes in accelerated flocks should be maintained at a consistent BCS*
- *Some dairy and prolific breeds carry a higher percentage of internal fat compared to meat breeds and target BCS 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 (19).*

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, increases risk of piling and death, reduces bunk attendance times, and increases the time spent waiting for access to feed. For more information on feeding space requirements see Chapter 4: 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 (20).

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

Producers must become familiar with potential micronutrient deficiencies or excesses in the geographic area and address it accordingly.

Sheep must be provided with sufficient amounts of a balanced ration to meet their nutritional requirements.

Body condition must be monitored regularly and corrective action must be taken if the body condition score for an individual sheep is less than 2 out of 5 (see also Section 6.3 Sick, Injured, or Cull Animals).

Sheep must have access to roughage.

Diet changes must be made gradually to reduce the risk of health problems such as grain overload, acidosis, bloat, or other metabolic diseases. 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.

Reasonable steps must be taken to prevent exposure of sheep to toxins (e.g. plants toxic to sheep, lead batteries, fertilizer, treated seed, nitrates) and to toxic feed (e.g. mycotoxins).

RECOMMENDED PRACTICES

- a. work with a nutritionist
- b. test nutrient content of feed ingredients used and balance rations as necessary
- c. manage feedstuffs in a way to maintain quality and minimize spoilage.

5.1.1 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. A producer should have stored or artificial colostrum available for use if a ewe has low colostrum or in case of large litters. See Section 7.10 Pregnancy, Lambing and Neonatal Care for requirements relating to colostrum consumption.

5.1.2 Artificial Rearing

With time and access to a fibrous diet, ruminants develop the ability to digest plant-based diets; however, neonatal ruminants are not initially capable of digesting starch and sucrose (21). 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.

Rumen development in lambs is a gradual process that depends on early dietary exposure. At birth, the rumen is underdeveloped and has limited function, but it begins to mature as lambs start consuming solid feed. Access to creep feed (concentrates) or fresh pasture promotes the production of volatile fatty acids which stimulate the growth and development of rumen papillae. At the same time, access to roughage/fibrous feed such as hay or pasture supports muscular development of the rumen and helps establish normal rumination behaviour. Together, these feeds play complementary roles, with concentrates driving internal rumen surface development and fibrous feeds supporting physical structure and function.

Additionally, access to water enables microbial fermentation of feed in the rumen, supporting the production of volatile fatty acids that drive rumen development. Therefore, lambs need access to fresh and clean water from an early age to support proper rumen maturation.

REQUIREMENTS

Newborn lambs that are taken from their dams must receive colostrum within six hours of birth (see also Section 7.10 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 free-choice or at appropriate time intervals to promote health, growth and vigour.

Prior to weaning, lambs must have access to roughage and 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. when feeding orphaned lambs follow the feeding instructions provided by the milk replacer manufacturer
- d. 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, automatic milk feeders, or other methods as recommended by the flock veterinarian or nutritionist.

5.2 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. 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 (22). 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). Maintaining clean waterers and periodically testing water quality helps ensure water is safe and palatable.

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.

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 only acceptable as a sole water source for the breeding flock if all of the following conditions are met:

- 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. test water quality annually and at high-risk periods (e.g. drought, spring/fall) or whenever problems such as reluctance to drink or reduced feed intake are observed
- b. provide water at all times, especially during lactation.

Chapter 6 Health Management

6.1 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 (including vaccination), reproductive events, performance indicators (e.g. birth weight, weaning weight) and mortality. Sufficient records to allow assessment of flock performance should be maintained as part of a flock health and welfare plan.

Health problems that are caught and dealt with quickly will affect fewer animals (23).

REQUIREMENTS

Sheep must be monitored at least once daily to ensure well-being in accordance in all sections of this Code.

Accurate and detailed animal health records must be kept. At a minimum, this must include treatment and mortality records.

All stockpeople must understand the reporting requirement for reportable diseases and immediately consult the flock veterinarian when suspected cases occur.

6.2 Veterinary Care and Flock Management Programs

Veterinarians are an important resource for helping producers establish and implement effective flock health and welfare plans. A flock veterinarian/veterinary practice can provide care of sick or injured animals as well as advice on control, prevention, and treatment of common diseases and conditions of sheep, as well as monitoring disease and health trends. Veterinary services are most effective when applied proactively.

Veterinary-Client-Patient Relationship (VCPR)

A valid VCPR helps ensure that your veterinarian will be familiar with your flock and management practices. A VCPR is established and maintained through timely visits to the farm which can include scheduled flock health visits and emergency calls. Telephone, texted photos and videos, email, or video calls ("telemedicine") can also work well, especially over longer distances. With a VCPR, 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 legally required for veterinarians to dispense both advice and healthcare products.

While the definition of a VCPR varies by province, all contain the same components (56):

- the veterinarian has assumed the responsibility for making clinical assessments and recommendations regarding the health of the animal(s) and the need for medical treatment
- the veterinarian has sufficient knowledge of the animal(s) on which to base the assessment, diagnosis, and treatment of the medical condition of the animal(s). This means that the veterinarian has recently seen and is personally acquainted with the keeping and care of the animal(s) by virtue of an examination of the animal(s) or by medically appropriate and timely visits to the premises where the animal(s) are kept
- the client has agreed to follow the veterinarian's recommendations and prescription
- the veterinarian is available or has arranged for follow-up evaluation, especially in the event of adverse reactions or failure of the treatment regimen.

Drug and Vaccine Use

Most livestock drugs and vaccines can only be prescribed and dispensed by a licensed veterinarian to a client with which they have a valid VCPR.

When treating, correct dosage, administration, and length of treatment all contribute to more effective treatment and better outcomes. As almost all drugs used for sheep are considered 'extra label drug use' (ELDU), these can only be accurately provided by a licensed veterinarian within a VCPR.

Flock Management Plans

A flock health and welfare plan should cover the yearly production cycle (24). 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 may include:

- a record keeping system (see Section 6.1)
- a schedule for flock inspection/shepherding
- breeding management
- nutritional/pasture management
- disease prevention and management
- a management plan for husbandry procedures
- SOPs for treatment procedures, pain control, 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) (see Chapter 2: Emergency Preparedness and Management)
- a corrective action plan for key problems, if applicable.

REQUIREMENTS

All producers must have a valid veterinary-client-patient relationship (VCPR) with a licensed veterinarian to obtain prescription veterinary products (see Appendix I: Accessing Veterinary Services).

Producers must have a flock health and welfare plan.

All veterinary products used for sheep must be safe for use, stored according to label directions, and expiration dates must be monitored.

RECOMMENDED PRACTICES

- a. prepare a written health and welfare plan for each flock. It should be developed with appropriate veterinary and technical advice, incorporate best management practice SOPs, and be reviewed and updated annually
- b. keep all SOPs and medical records in a manner that they can be readily accessed by all stockpeople and protected from damage.

6.3 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 Appendix J: Euthanasia Decision Tree). The flock should be monitored regularly and individual animals to be culled should be identified early and before welfare or production issues occur.

Disease detection in sheep requires careful observation to detect subtle changes in behaviour (25). Sheep tend not to display overt signs of illness. Health problems will be identified earlier if stockpeople monitor the flock regularly (see Appendix K: Signs of Illness, Injury, and/or Pain in Sheep).

Sheep displaying signs of illness, injury or disease (see Appendix K: Signs of Illness, Injury, and/or Pain in Sheep) require a thorough examination and assessment (see Appendix L: 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 Canadian Verified Sheep 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

The list of topics covered in Section 6.3 (including 6.3.1, 6.3.2 and 6.3.3) is not exhaustive but provides information on topics that are particularly relevant to sheep.

REQUIREMENTS

Sick, injured, or diseased sheep must receive prompt treatment and nursing care, or be euthanized immediately. The treatment and monitoring must be appropriate for the condition, if in doubt consult a veterinarian without delay. For sheep 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 7: Husbandry and first aid, must be performed by a licensed veterinarian.

Sick, injured, or diseased animals must be managed to allow for treatment, reduce the risk of injury, 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. keep records of disease occurrence and all treatments provided
- c. maintain records of reasons for culling, euthanasia, or death on farm to identify trends and reduce on-farm mortalities.

6.3.1 Parasite Control

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

Ectoparasites include biting insects (e.g. mosquitos, blackflies, ticks, keds, lice, nasal bots, mites) and can lead to itchiness, wool loss, damage to the skin, and more severe disease if left untreated.

Endoparasites (e.g. gastrointestinal nematodes (GIN), tapeworms, liver fluke, lungworm, coccidia) can cause diarrhea, emaciation, anemia, and can kill sheep if uncontrolled.

The rise of anthelmintic-resistant GIN is a key constraint when designing effective, sustainable parasite prevention and control programs. Management strategies should consider:

- selective treatment with anthelmintics (rather than blanket treatment of whole flock)
- appropriate dosing (e.g. weighing sheep)
- appropriate storage of drugs
- regular calibration of dosing guns
- avoiding long-acting therapies
- genetic selection for parasite resistance
- appropriate grazing strategies
- ensuring adequate nutrition
- routine monitoring (e.g. fecal egg counts, FAMACHA scoring, and record keeping).

Canines can transfer *C. ovis*/*T. ovis* to sheep which is a cause of carcass condemnation (27). Discussing regular deworming of all canines with the flock veterinarian is important.

It is important to work in conjunction with the flock veterinarian to accurately assess any problems and develop specific control and treatment strategies.

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.

6.3.2 Blowfly-Strike

Blowfly-strike is a serious welfare issue for sheep (26). Blowfly-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 sheep. The maggots create painful multiple wounds, which, if undetected, can debilitate a sheep to the extent that it eventually dies of secondary infections, sepsis, or shock.

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

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

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

The risk of blowfly-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 blowfly-strike must receive prompt treatment.

Producers must understand the basic biology of the blowflies that cause strikes.

Producers must determine the relative risk of blowfly-strike based on:

- predisposing environmental factors (e.g. warm, humid conditions)

- predisposing sheep traits (e.g. dags, long tails, wet wool, footrot, open wounds)
- the seasonal presence of blowflies.

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

- consider the risk of blowfly-strike in the risk/benefit analysis when deciding to tail dock (Refer to Section 7.6 Castration and 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 blowfly-strike as soon as blowfly season begins and during prolonged damp and humid weather.

RECOMMENDED PRACTICES

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

6.3.3 Lameness

Lameness in sheep is a serious condition affecting welfare. Lameness is usually an indication of pain and suffering. Lam animals have difficulty moving to find food and water, so they may lose condition.

Common causes of lameness include: footrot, scald, laminitis, foot abscesses, arthritis, joint-ill, and injury. In some of these conditions hoof trimming may be required (refer to Section 7.5 Hoof Trimming). A locomotion scoring system can be a useful tool to evaluate progress of a lameness reduction strategy (28).

REQUIREMENTS

Stockpeople must recognize lameness, assess severity and take prompt action to resolve the lameness as quickly as possible.

All sheep must have access to a well-drained or elevated lying area. Constantly standing in mud is not acceptable.

Producers must consult their flock veterinarian regarding appropriate treatment and control strategies, which may include pain control.

Chronically lame sheep must be culled, euthanized, or under the direct care of a veterinarian.

RECOMMENDED PRACTICES

- a. cull chronic carriers of infectious conditions
- b. institute a biosecurity protocol that protects against bringing foot diseases onto the farm
- c. monitor lameness by regularly observing and recording locomotion scores on all sheep (see Appendix M: Training Materials and Tools for Sheep Locomotion Scoring)
- d. consider using locomotion scores when implementing a lameness reduction strategy as a tool to measure progress.

Chapter 7 Husbandry

7.1 Handling, Grouping and Moving Animals

Sheep are handled and subjected to different management procedures for health and production reasons (e.g. vaccination, foot bathing, shearing, and sorting). Understanding the behaviour of sheep facilitates handling, leading to reduced stress and injury and improved handler safety (30).

Sheep are sensitive to sudden changes and respond strongly to the predictability and familiarity of their environment. As social animals with strong flocking instincts, they should be handled in groups to reduce stress (9, 29, 31). Good handling facilities should use sheep's natural behaviours, including their flight zone. Keeping a safe distance of 3-4 metres helps reduce stress.

Positive reinforcement (e.g., food rewards), familiar environments, and gentle handling can improve cooperation and reduce fear (29). Reducing fear improves welfare, handling efficiency, and performance, and lowers injury risk. Sheep remember past experiences (29) and can recognize individual humans (32, 33, 34), making positive interactions valuable.

Use minimal restraint (e.g., hand under jaw) and never lift, drag, or pull sheep by fleece, tail, or ears. A crook may be used in open spaces to catch sheep by the neck or leg. A well-trained dog can save a producer a great deal of effort when herding and moving sheep. Handlers and dogs should be trained to work effectively together. Herding dogs can represent a threat and induce fear in sheep, especially in sheep unfamiliar with them. 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.

Dogs may become overly excited with sheep in confined areas, particularly if the flock is not moving well. It is critical to use dogs appropriately in confined spaces. Sheep will remember the frightening experience and may be reluctant to enter the handling system the next time.

Mixed-Sex Grouping

Pregnant feeder lambs being sent to sales yards, feedlots, and processors is a serious animal welfare concern for both the ewe and the fetus. If you keep intact males and females together, consider the following:

- ewe-lambs can become pregnant as early as 12 weeks of age
- sheep can breed out of season
- market lambs may not go straight to slaughter.

Therefore, the best option is to manage ewe-lambs and intact ram-lambs appropriately (e.g. separated). If appropriate management is not feasible, castrating ram-lambs should be considered. If there is a risk that feeder ewe-lambs being shipped are pregnant, they should be ultrasound scanned to ensure pregnant ewe-lambs are not sent to slaughter.

REQUIREMENTS

Procedure(s) must be planned to minimize the frequency, duration, and degree of restraint (e.g., try to group procedures where appropriate).

Sheep must be handled in such a way as to minimize the risk of pain, injury, or distress. For example:

- sheep must not be grabbed, dragged, or lifted by the fleece, tail, or ears
- minimize time held on their side or back, especially if the rumen is full or if they are heavily pregnant.

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

Sheep must not be mistreated. Unacceptable actions include, but are not limited to: kicking, striking, slamming gates on sheep.

Stockpeople using stock dogs to move sheep must be trained to handle dogs, or be under the supervision of a trained dog handler.

Stock dogs must be under control and must not be allowed to force the sheep too fast nor to continue to force the sheep when they have nowhere to go.

Stock dogs must not be allowed to nip or bite the sheep in an aggressive manner.

Breeding-aged lambs must be managed in a way that prevents unwanted pregnancies.

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 N: 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

7.2 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 (35). 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 (29). 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 (36).

Hot iron or freeze branding are not acceptable as identification methods for sheep in Canada. For export requirements ear tattoos are an acceptable form of Country of Origin identification.

REQUIREMENTS

All sheep and lambs leaving the farm of origin must be identified with an approved national sheep identification (i.e. CSIP tag).

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.

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

Tags must:

- be suitable for the sheep's age, size, and breed
- be limited to two per ear to maintain natural ear position
- be positioned according to the manufacturer's instructions.

Branding must not be used.

RECOMMENDED PRACTICES

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

7.3 Predation Management

Providing protection from predation is necessary for the well-being and welfare of sheep. Predation of livestock by wild, feral, or domestic animals can have severe consequences on sheep welfare, by causing fear, stress, pain, significant injury, and/or death. Sheep that are not injured can experience considerable stress from being chased (2). Dogs may chase and attack sheep as part of their normal behaviour; therefore, they must be considered potential predators.

Using livestock guardian animals can provide the flock with round the clock protection. Effective guardians prevent injuries and deaths and give the farmer peace of mind. To select an effective guardian animal, match its capabilities to the environment, livestock, and flock size. Common guardians include dogs (e.g. Great Pyrenees), llamas, or donkeys. Consideration should be given to the species, the terrain, predator pressure, climate, and the need for the animal to bond with the flock from a young age when selecting a guardian. Guardian dogs are considered part of the flock and have unique needs and management (e.g. regular deworming for *C. ovis*) compared to companion or other working dogs.

Lethal control alone can be ineffective at preventing future conflicts (57, 58, 59, 60, 61, 62) especially when underlying causes are not addressed. Research has shown that in some situations lethal control can cause further conflicts (1). Non-lethal, proactive practices can minimize and even prevent sheep predation events (63). Some of these methods include:

- prompt removal and appropriate disposal of deadstock
- regular supervision of livestock
- livestock guardian animals (e.g. dogs, donkeys, llamas, etc.)
- night corrals
- confinement and barriers (fencing and fladry¹)
- scare devices such as bright lights/air horns/starter pistols
- moving sheep to a less vulnerable area
- developing an awareness of local predator behaviours, habitats, and movement patterns
- work with neighbouring properties to deter predation.

Nothing replaces a human presence in preventing predation conflicts; shepherds and range-riders are a long-standing proven practice still used across Canada today (64).

In areas of high predation, it may be necessary to consider adapting or altering production practices to protect the welfare of the flock. When predator attacks happen, producers must provide prompt and appropriate care to minimize pain and suffering for the animal.

Learning how to properly use prevention-based tools and methods is important. Predators are intelligent and can learn or habituate over time so an adaptive approach may be required. Predation management strategies should be re-evaluated if conflicts increase.

Check with local or provincial authorities for possible conflict prevention methods and tools suitable for a specific area. There may be funding support for prevention-based tools or compensation programs for verified predator losses.

REQUIREMENTS

Lethal or non-lethal actions involving wildlife must comply with provincial and federal wildlife legislation.

Producers must be aware of predation risks in their area and develop and implement a proactive strategy that incorporates best management practices appropriate for their location.

Deadstock must be promptly removed and disposed of appropriately to avoid attracting predators.

Producers must provide prompt and appropriate care for sheep attacked by predators (see Section 6.3 Sick, Injured, or Cull Animals and Section 9 Euthanasia for more information).

Working Livestock Guardian Dogs (LGDs) and other guardian animals (e.g. llamas and donkeys) must be attentive to sheep but not harm or harass them.

¹ Fladry is a line from which brightly coloured flags are suspended. The fladry line can supplement an existing fence in order to prevent canine predators from accessing livestock. For further detail see: <https://mbbeef.ca/wp-content/uploads/2024/01/Livestock-Predation-Prevention-Project-Fladry-Wire-Factsheet-Proof-2p.pdf>

RECOMMENDED PRACTICES

- a. include a *Sheep-Predator Conflict Prevention Plan* within the flock health and welfare plan. This should reflect current best practices for minimizing losses while coexisting with nature
- b. increase human presence during more vulnerable periods such as lambing seasons
- c. monitor sheep frequently and remove any sick or injured individuals from the flock which may draw in predators. These individuals should be closely supervised while they are more vulnerable
- d. producers should have a policy and operating procedure for the immediate removal off-site, or on-site composting, burning, or burial of deadstock and/or afterbirth so as not to attract predators close to areas being used for sheep
- e. consider the feasibility of keeping sheep in areas of lower predation or changing the production system to reduce the risk of predation
- f. recognize the signs of predation and examine dead or injured sheep to identify likely predators. Document with photographs to share when reporting the incident
- g. report predation incidents to the appropriate authorities (e.g. provincial agency)
- h. learn about predators in your area to better understand why conflicts can occur with livestock and how to prevent them
- i. take time to research guardian animal options before making a decision or purchase.

7.4 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 blowfly-strike (37). 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 blowfly-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 prior to shearing will reduce rumen and bladder fill, which will limit soiling of the shearing area. This will help with both shearer and sheep safety, and sheep comfort during shearing process.

It is important to be aware of the risk of spreading disease between flocks or between animals within a flock during shearing.

Shearing removes 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 (38).

REQUIREMENTS

All wool sheep must be shorn at least annually and as frequently as necessary, to mitigate animal health and welfare concerns.

Shearing of pregnant ewes in the last month of gestation must only be done by an experienced shearer or shorn while standing.

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 disinfected between flocks and equipment disinfected between sheep within a flock when there is a 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).

Feed and water access prior to shearing must be managed to ensure animal comfort and safety is maintained during the shearing procedure.

RECOMMENDED PRACTICES

- 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
- provide extra feed, shelter and shade for sheep after shearing
- crutch full-fleece ewes if they cannot be shorn prior to lambing
- refer to Table 7.1 for recommended time off feed and water prior to shearing.

Table 7.1 Recommended minimum and maximum time without feed and water prior to shearing. It should be noted that these refer to minimum and maximum periods of time without feed and water prior shearing for any individual sheep. Work with the flock veterinarian and shearer to determine optimal time off feed and water for individual farms.

	Without Feed		Without Water		Special Considerations
	Min. hours	Max. hours	Min. hours	Max. hours	
MATURE SHEEP					
Ewes (non-pregnant, early to mid-pregnancy) & Adult male sheep	18	32	12	24	Exceeding these maximums may induce metabolic problems and/or precipitate clinical diseases.
Ewes: late pregnancy (last trimester (6-7 weeks) of pregnancy) & lactation	12	24	8	20	Exceeding these maximums may induce metabolic problems and/or precipitate clinical diseases. <i>*Unweaned lambs must remain with the ewe as long as possible prior to shearing; separation must not exceed 24 h.</i>
LAMBS					
Pre-weaning	6	24	6	20	Exceeding these maximums may precipitate clinical diseases. <i>*Unweaned lambs must remain with the ewe as long as possible prior to shearing; separation must not exceed 24 h.</i>
Weaned	12	24	8	20	Exceeding these maximums may precipitate clinical diseases.

7.5 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 (39).

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/genetics, 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.

Trimming equipment must be clean and well-maintained.

Equipment must be disinfected between flocks.

If there is a known disease transfer risk, equipment must be disinfected between sheep within a flock.

7.6 Castration and Tail Docking

Castration and tail docking can be necessary procedures in some flocks or situations for welfare, health and/or hygiene reasons, including blowfly strike and early/unwanted pregnancies (40). Producers must assess whether these procedures are necessary for their specific circumstances.

Castration and tail docking at any age cause pain (29). Pain relief reduces the impact of these procedures on suffering and should be used when and wherever possible.

There are pain mitigation drugs approved for use in sheep in Canada; however, use in young lambs is extra-label due to their age. These drugs must be prescribed and dispensed by a veterinarian.

Desensitization of the tail or 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 (41). 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, and the difficulty of using current drug formulations (39).

Veterinarians must work with sheep producers to develop practical, safe, and effective protocols for reducing pain resulting from these procedures and these protocols should be included in each farm's

health and welfare plan. See Canadian Veterinary Medical Association [CVMA] position statements on: [Castration of Cattle, Sheep and Goats](#) (42) and [Tail Docking of sheep](#) (65). 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.

Where castration or tail docking are carried out, wounds increase the risk of tetanus and other clostridial diseases. Ensuring lambs are protected through timely vaccination or adequate maternal immunity at docking is a key and effective disease-prevention measure.

Castration

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. When intact male and female lambs are reared together there is a risk of unwanted reproduction (2, 40).

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 (29). 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 (29):

- combining the use of a rubber ring with a clamp
- injecting local anesthesia into the scrotal neck and cord or the testis
- anesthetic-impregnated rubber rings
- 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 and associated structures increase which when constricted by rubber rings, can give rise to chronic inflammation and pain until healing occurs. 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.

Tail Docking

Tail docking in sheep is done for health and hygiene reasons (40). Some studies have shown that tail docking can reduce the risk of blowfly-strike in situations where blowfly-strike is likely to occur (29). Blowfly-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 (46).

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 blowfly-strike.

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 (29).

The pain associated with rubber rings can be reduced by (29):

- combining the use of a rubber ring with a clamp
- using local anesthesia at the site before the rubber ring is applied
- anesthetic-impregnated rubber rings
- 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 blowfly-strike). Docked tails must cover the vulva in ewes and the equivalent in rams when they are adults.

REQUIREMENTS

The decision to castrate or tail dock must be based on a welfare risk/benefit analysis rather than as a routine.

Producers must work with their veterinarian to develop and implement practical, safe, and effective pain control protocols.

Producers must monitor for signs of post-procedural complications and take appropriate corrective action.

When castrating and/or tail docking, the procedure must be done at the youngest age possible allowed by the system of production.

Tail docking or castration over 6 weeks of age must be done by a veterinarian with pain mitigation.

Additional requirements for castration

Short scrotum castration must not be practiced.

Additional requirements for tail docking

Tails must not be docked for cosmetic purposes.

Tail docking using a surgical technique (i.e. using a blade alone) must be done by a veterinarian.

Rubber rings must not be applied beyond six weeks of age.

When docking tails, tails must cover the vulva in ewes and the equivalent in rams when they are adults (see Appendix O: Dock Smart – Cover What Matters).

RECOMMENDED PRACTICES

- a. whenever possible, castration and tail docking should be completed following colostrum intake, between 24 hours – 7 days of age

- b. ensure clostridial vaccinations for ewe flock is up to date
- c. consider performing tail docking and castration at the same time.

7.7 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.

7.8 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 (43).

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.

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.

7.9 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 (44).

Breeding decisions

The management, marketing and breeding objectives of the farm will dictate which breeds are best suited to a particular operation (45). 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.

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 (46). 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. When regrouping rams, careful management strategies are needed over several days to prevent injury, fighting and aggressive behaviour among rams while they establish a dominance hierarchy (47).

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.

REQUIREMENTS

Producers must plan breeding such that appropriate supervision and shelter at lambing will be available.

Vasectomies, laparoscopic artificial insemination, and embryo transfer are considered surgical procedures and must be done by a veterinarian.

Electroejaculation must only be performed by a veterinarian.

Rams must be managed taking into account the risk of aggressive behaviour to reduce the risk of serious injury due to fighting.

During the breeding season, producers must increase the frequency of monitoring of rams for injuries, health and lameness.

RECOMMENDED PRACTICES

- a. make responsible and informed decisions when selecting breeds and matching rams with ewes, to reduce the risk of lambing difficulties
- b. be aware of the risk of genetic disorders and take steps to avoid propagation of such abnormalities
- c. 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).

7.10 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 (31).

Pregnancy

Adequate nutrition throughout gestation is essential for proper placental and fetal development. Balanced nutrition, appropriate body condition, and good dam management during pregnancy support fetal development, lamb vigour, and survival at birth. Proper gestational nutrition also helps prevent nutritional disorders that can affect the health and performance of the dam and her offspring and influence milk production (48).

Two important assessment tools that can be used to evaluate and manage nutritional status during gestation include:

- Body Condition Scoring (BCS), which reflects the nutritional well-being of gestating females and is a key management tool for optimizing ewe health and lamb survival. Although BCS is a subjective, hands-on assessment, it is a reliable tool when applied accurately and consistently by trained assessors (see Appendix H: Body Condition Scoring).
- Pregnancy diagnosis, using ultrasound to determine fetal number, which supports more precise nutritional management during gestation. This helps prevent oversized single lambs and underfeeding of females carrying multiples, particularly in prolific breeds.

Shearing or crutching ewes with long fleece prior to lambing can help to reduce the risk of disease transmission, improves colostrum consumption and facilitates suckling. The decision to shear must also factor in environmental conditions and ewe body condition.

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) (29). 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 (69):

- 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.

Newborn lambs are highly susceptible to a number of infectious diseases, including joint ill. The newborn navel is a open pathway for bacteria to enter. If lambing indoors, a clean, dry, and well-bedded (66) area in which to give birth must be provided (refer to Section 4 Facilities for further reading resources on lambing facility design).

In extensive production systems, ewes should be disturbed as little as possible. Producers must balance the benefits of intervention with the potential risks associated with handling stress, particularly in flocks that are not accustomed to close human contact. All lambing should be supervised adequately 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 (29).

Colostrum intake is the single most important factor in ensuring lamb survival. Newborn lambs are born with limited brown fat reserves that help maintain body temperature immediately after birth (46). These reserves are quickly depleted and must be replaced through energy intake, making early colostrum consumption critical for maintaining body temperature, lamb vigour, and survival. In cold, wet, or windy conditions, heat loss is accelerated, shortening the time lambs can maintain body temperature before suckling and increasing the risk of hypothermia if colostrum intake is delayed or inadequate (67). In addition to providing energy for heat production, colostrum also contains antibodies that help protect newborn lambs from disease. Lambs that do not receive colostrum will generally die (20). 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 (IgG) 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 (68, 69).

Newborn lambs are susceptible to hypothermia especially when still wet from the birthing process. Early identification and intervention for lambs that have not suckled, or that show early signs of hypothermia, are critical to lamb survival. Prompt intervention relies on having appropriate equipment and supplies readily available, including a warming box, drying towels, stomach tube, and supplemental colostrum (49, 50). Where additional support is required, veterinary or specialist advice can help guide appropriate management procedures to reduce the risk of hypothermia and to treat affected lambs (see Appendix P: Lambing and Neonatal Care).

Stockpeople need to be able to recognize problems during the perinatal period and understand when and how to step in and provide assistance. Less experienced stockpeople benefit from guidance and training in lambing management and neonatal care. Including lambing management and neonatal care within flock health and welfare plans helps support consistent and effective decision-making at lambing. Recognizing personal limits and involving a veterinarian or specialist when unsure helps ensure timely and appropriate actions (see Appendix P: Lambing and Neonatal Care).

REQUIREMENTS

Body condition scores and health must be monitored on an ongoing basis during gestation and feeding programs must be adjusted to maintain suitable body condition scores; seek the help of a nutritionist or veterinarian if required.

Lambing must be supervised to ensure timely action is taken as required, while keeping disruption and disturbances to a minimum.

Appropriate assistance must be provided when signs of lambing difficulty are observed. Seek assistance from an experienced producer or veterinarian when necessary.

Ewes with dystocia that cannot be corrected by farm personnel must be promptly seen by a veterinarian or euthanized.

Prompt action must be taken to care for sheep affected by vaginal or uterine prolapse.

Obstetrical surgeries must be performed by a veterinarian.

Fetotomy 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, and well-bedded area for lambing must be provided.

When lambing inside in cold temperatures, extra bedding 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.

For newborn lambs that do not nurse voluntarily, sufficient colostrum must be provided as soon as possible but not more than 12 hours after birth in order to reduce risk of hypothermia and/or hypoglycemia and ensure transfer of passive immunity (see Appendix P: Lambing and Neonatal Care).

All milk replacers used for lambs four weeks of age or younger must be 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. palpate udders and identify ewes that have poor udder health
- e. ensure adequate colostrum consumption, either directly from the ewe or by bottle or tube feeding:
 - 50ml per kg of bodyweight within two hours of birth
 - 200ml per kg of bodyweight within the first 24 hours
- f. include the flock veterinarian in developing neonatal lamb care protocols
- g. 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
- h. euthanize lambs with frostbitten feet
- i. 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.

7.11 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 5.1 Nutrition and Feed Management). Sheep behaviour in the milking parlour is likely to be influenced by both genetic factors and their previous handling experience (51).

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 (51).

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 order to promote good udder health.

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

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

Milking must follow a regular routine and be frequent enough to ensure that the ewes are not left with unrelieved, distended udders.

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

Ewes in their first lactation must be trained to the milking system.

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 mastitis
 - avoiding excessive stripping (52)
 - 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, milk production, and milk quality
 - include a mastitis control strategy in your flock health and welfare plan
 - annual inspection of milking equipment by a qualified person.

7.12 Dairy Sheep – Early Weaning of Lambs

Dairy lambs are either removed from their mothers shortly after birth and reared on milk replacer (see Section 5.1.2 Artificial Rearing) or are weaned at a later age (usually 30 days).

REQUIREMENTS

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

7.13 Managing Deadstock

Deadstock attracts scavengers such as rodents, carrion birds, and predators, which may carry diseases. Additionally, deadstock can serve as a source of disease and contaminate water and feed. Scavenging predators, attracted to where livestock are housed or pastured, may also injure or kill animals. Where

deadstock pick-up is not available, composting, burial, and incineration are all management options to consider.

REQUIREMENTS

Deadstock must be removed promptly from areas where livestock are housed or pastured.

Disposal of deadstock must follow applicable federal, provincial, and/or municipal regulations.

RECOMMENDED PRACTICES

- a. manage deadstock to prevent scavenging by dogs or wildlife
- b. manage deadstock to prevent contamination of livestock rearing areas, feed, or water sources
- c. keep records of losses including deaths, culling, and euthanasia to identify trends.

Chapter 8 Preparations for Transport

8.1 Introduction

Everyone involved in the transportation of animals (e.g., planning, loading, transport, or unloading) shares responsibility to ensure that the entire process is conducted in a way that prevents injury or suffering. The Code of Practice for the Care and Handling of Sheep applies up to the farm gate. However, many of the Codes expectations affect how sheep are prepared for transport and how transport is planned and carried out.

Producers and on-farm staff who make decisions about shipping sheep - such as selecting animals, timing shipments, or arranging transportation - are responsible for understanding and following the rules that apply to animal transport.

Federal rules for transporting animals are found in **Part XII (Transport of Animals)** of the **Health of Animals Regulations** (53). These rules apply not only to the person physically loading or hauling the animals, but also to anyone who decides, directs, or arranges for sheep to be loaded or transported.

This means producers, people booking or arranging transport, and anyone handling sheep during loading or unloading all share responsibility for meeting transport requirements.

This Code is not a comprehensive resource for the applicable provincial and federal regulations; they must be reviewed in their entirety.

Not following Federal transport regulations - or any additional provincial or territorial requirements - can lead to enforcement actions, including fines or prosecution.

REQUIREMENT

All those involved in transporting sheep - including those who arrange transport, load, transport or unload animals - must have sufficient knowledge of applicable federal and provincial animal transport legislation and regulations and comply with them.

RECOMMENDED PRACTICES

- a. use tools such as CFIA, CSF, [Animal Health Canada transport e-learning courses](#), and provincial sheep associations to help guide your understanding of the transport requirements.

8.2 Pre-Transport Planning

Pre-transport planning plays an important role as these decisions will influence sheep welfare during transport. Proper pre-planning aims to reduce the risk of injury or suffering and supports the desired outcome of sheep arriving at their destination safely and in good condition.

Pre-transport planning includes the decisions, scheduling, and arrangements made from the time the decision to transport sheep is taken until loading begins. Key elements of effective pre-transport planning include:

- assessing risk factors associated with the journey
- assessing the sheep capacity to withstand the journey (fitness for the planned transport)

- arranging transport and communicating relevant transport information to support proper planning.

8.2.1 Assessing Risk Factors

Understanding the nature of the planned journey is an important part of pre-transport planning, as the associated risk factors must be considered to determine whether sheep are able to withstand the transport. Those responsible for planning transport should be familiar with, or at least have a general understanding of, the overall journey, including the following elements:

- total transport duration
- transit through intermediary sites (e.g., auction markets, FWR points, assembly yards)
- potential delays
- weather conditions forecasted
- type and specifications of the conveyance
- total time sheep will be without feed, water, and rest (FWR).

Evaluating these factors together supports sound decisions about scheduling, loading density, FWR needs, and environmental conditions mitigation. Proper assessment helps ensure sheep can withstand the journey and allows planners to determine whether additional measures are required.

REQUIREMENTS

People planning transport must consider journey-related risk factors that could affect sheep's ability to withstand the journey.

RECOMMENDED PRACTICES

- a. people arranging transport should ensure that the receiving location is expecting the sheep and has the personnel and facilities needed to meet the animals' needs upon arrival.

8.2.2 Assessing the Sheep's Capacity to Withstand a Journey

A sheep's ability to cope with transport is influenced by its condition at shipping and by journey characteristics. Sheep-related factors (e.g., age, body condition and health, mobility, and recent handling or stress) interact with journey-related factors such as duration, distance, unloading/reloading at intermediary sites, weather conditions, trailer design, handling practices, and the space available for thermoregulation and resting.

A journey that a adult healthy sheep can tolerate under favourable conditions may pose significant risks for sheep with reduced ability to cope with stress or when conditions are more challenging. Although some sheep may tolerate up to 36 hours without feed, water, and rest, others may experience dehydration, nutritional deficits, or exhaustion much sooner.

Assessing each animal's ability to withstand the planned journey helps prevent avoidable suffering, deterioration in condition during transport, and poor welfare outcomes on arrival. This assessment supports informed decisions so that only animal's capable of tolerating the journey are shipped.

At this stage of planning, any sheep that may be considered compromised must be identified, including how many animals are affected, their condition, and how long they could safely cope with transport. Animals'

compatibility must also be assessed, as animals or groups that are incompatible must be kept separate. Animals are considered incompatible if being kept together is likely to result in suffering, injury, or death, such as due to differences in size, reproductive status, behaviour, or other risk factors.

Incompatible individuals and compromised ones must be isolated from others during transport. Compromised sheep also have specific transport restrictions that must be considered and incorporated into the planning process.

REQUIREMENTS

People planning a journey must:

- **assess whether sheep can withstand the expected journey by considering their condition and journey-related risk factors**
- **assess the compatibility of the animals and identify any animals or groups that must be kept separate**
- **determine whether there are compromised individuals in the load and plan accordingly.**

8.2.3 Arranging Transport and Communicating Relevant Transport Information to Support Proper Planning

By this stage of pre-transport planning, you should know:

- the condition of the sheep,
- the risks linked to the journey, and
- whether the sheep are fit to handle the planned transport.

With this information, self-haulers can finalize their journey plan (including a contingency plan in case of delays or if animals become unfit or compromised during transport), and producers using a commercial transporter have what they need to proceed.

All of this information should be clearly shared with everyone involved, from the person checking sheep on farm through the full communication chain, up to the truck driver. This ensures the right decisions are made about:

- how many sheep can be loaded,
- whether any animals need to be separated,
- how long sheep can travel before feed, water, and rest are needed, and
- when loading and unloading should happen.

Before loading, the maximum number of sheep the trailer can safely carry should be agreed upon with the transporter. This depends on:

- available floor space and trailer design,
- ventilation and airflow,
- journey length and planned stops,
- type of sheep (animals' size, age, stage of production, shorn or not, general condition, etc.), and
- expected temperature and humidity, both outside and inside the trailer.

Getting the right loading density is critical. In warm or humid weather, loading too many animals reduces airflow and increases the risk of heat stress. Providing the right amount of space helps sheep stay comfortable and reduces the risk of temperature-related stress and illness during transport.

REQUIREMENTS

Producers hauling their sheep must have a contingency plan to address unforeseen delays or situations where animals become compromised or unfit during transport.

RECOMMENDED PRACTICES

- a. ensure sheep condition and journey details are shared clearly and consistently with everyone involved, from the person assessing sheep on farm through the entire chain of communication, including the truck driver
- b. the producer and transporter should agree in advance on the number of animals the trailer can safely carry, taking into account the planned journey and the weather forecast
- c. verify that the type of conveyance expected to be used is compatible with the farm's loading and unloading facilities.

8.3 Shipping and receiving sheep

8.3.1 Personnel and movement of sheep

People involved in loading and unloading sheep must have a sound understanding of sheep behaviour and how these natural behaviours can be used to facilitate the safe and effective movement of animals. They should also be competent in low-stress handling techniques, able to recognize behaviours that indicate stress or distress, and knowledgeable about appropriate strategies to prevent or mitigate these responses.

REQUIREMENTS

Personnel involved in loading, unloading, or transporting sheep must have sound knowledge of sheep behaviour and have the competence to conduct these activities in compliance with the Health of Animals Regulations.

Appropriate and humane methods must be used at all times when moving sheep.

Stock handlers must not:

- beat, strike, whip, or kick any sheep
- use electric prods
- use any driving device or method likely to cause injury, suffering, or death
- drag sheep
- handle sheep in any manner likely to cause injury, suffering, or death, including lifting or pulling sheep by their wool.

RECOMMENDED PRACTICES

- a. clearly define the roles and responsibilities of each handler, including the transporter, before loading or unloading
- b. allow sheep to move at a pace that capitalizes on their strong instinct to follow the leader
- c. load sheep calmly and quietly.

8.3.2 Loading and Unloading Areas

Properly designed handling systems and loading ramps help to improve the ease of loading and reduce stress and the risk of injury during loading or unloading. Facilities should help sheep move calmly and safely between the barn and the transport vehicle. Good design reduces slipping, falling, injury, and stress. Using the same type of flooring, steady lighting, good airflow, and comfortable temperatures helps sheep move more easily. If ramps are needed, they must not exceed 35 degrees, have good footing, be wide enough for the sheep, and line up properly with the vehicle. Strong, stable facilities/equipment make loading and unloading safer for both sheep and people.

REQUIREMENTS

Loading and unloading facilities must provide secure footing, prevent sheep from falling, and be maintained to allow safe, efficient movement while minimizing the risk of injury or escape.

Ramps used to load or unload sheep into or from a conveyance must not have a slope that exceeds 35 degrees.

RECOMMENDED PRACTICES

- a. provide consistent conditions between the barn and the loading area, including flooring, lighting, air movement, and temperature, to minimize stress during movement and loading of sheep
- b. where lighting levels are not uniform, ensure sheep move from dimmer to brighter areas where possible, while avoiding sudden or extreme changes. Providing light inside the trailer may help encourage sheep to enter
- c. ensure gates, doors, and alleys are appropriately sized to promote steady sheep movement, reduce the risk of bruising or injury, and avoid sharp turns
- d. use solid sides on ramps, crowd pens, and chutes to reduce distractions and encourage calm, forward movement.

8.3.3 Basic Principles for the Transport of Sheep

Loading and unloading are often the most stressful stages of transport for sheep (54), and care should be taken to ensure the process is calm and efficient. Preparatory tasks such as completing paperwork and identifying compromised or unfit animals should be finalized before loading begins to minimize delays, promote smooth animal flow, and reduce stress.

RECOMMENDED PRACTICES

- a. ensure all documentation (e.g. livestock manifests, bills of lading, emergency contact info, flock health records, etc.) is completed in advance to avoid unnecessary delays.

8.4 Shipping Sheep

8.4.1 Compromised and Unfit Sheep

The person(s) responsible for sheep on the farm are responsible for assessing each animal's condition and fitness to withstand the intended journey. Transporters share this responsibility and have both the right and the obligation to refuse to load any animal that is unfit or, in their judgment, unlikely to withstand the full journey. Transporters may also refuse to transport compromised sheep if the applicable legal requirements for their transport (such as segregation or isolation from other animals) cannot be met.

Compromised Sheep

Sheep showing signs of infirmity, illness, injury, or other conditions that reduce their ability to withstand transport are considered compromised (53). Sound flock health and management practices (see Section 6: Health Management) help minimize the number of sheep classified as compromised for transport. A detailed list of conditions that render a sheep compromised for transport is provided in Appendix Q: Guidance for Transporting Sheep.

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.

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

A compromised sheep may be transported only if all the following conditions are met:

- the sheep is isolated (e.g., in its own compartment or with one familiar animal, provided that confining them together is unlikely to result in injury);
- the sheep is individually loaded and unloaded and does not have to negotiate internal ramps in the conveyance;
- appropriate measures are taken to prevent suffering, injury, or death during loading, confinement, transport, and unloading (e.g., additional bedding);
- the sheep is transported directly to the nearest suitable place where it can receive care, be promptly slaughtered, or be euthanized;
- the sheep is not transported to an assembly centre (e.g., auction market, assembly yard, or holding facility); and

- the sheep is provided with feed, water, and rest within 12 hours.

Unfit Sheep

Sheep that show signs of infirmity, illness, injury, or other conditions indicating that they cannot be transported without suffering are considered unfit for transport.

Examples of sheep that are unfit for transport include, but are not limited to:

- non-ambulatory sheep (downers)
- sheep that are extremely thin or weak
- sheep that are lame in one or more limbs to the extent that they exhibit signs of pain or suffering and halted movements or reluctance to walk, or are unable to bear weight on all four legs
- lactating sheep likely to experience udder engorgement before reaching their destination
- ewes in the last 10% of gestation or that have given birth within the preceding 48 hours
- lambs with an unhealed or infected navel
- sheep exhibiting laboured breathing.

A detailed list of conditions that render a sheep unfit for transport is provided in Appendix Q: Guidance for Transporting Sheep.

Unfit sheep must not be transported. They must be treated on farm, slaughtered on farm or euthanized (see Section 9: Euthanasia and/or Section 10: On Farm Slaughter).

Exception: An unfit sheep may be transported only if a veterinarian recommends that it be transported for the purpose of receiving veterinary care, and only when all conditions required for the transport of compromised animals (listed above) are fully met.

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

Special Considerations

Pregnant ewes: Well-managed transport of pregnant ewes that are fit for the intended journey and not in late gestation is considered acceptable. However, the transport of pregnant sheep to saleyards or processing facilities presents a significant animal-welfare concern. Transport-related stress can result in in-transit lambing, pregnancy loss, or death. For animals that arrive at processing plants pregnant, additional welfare concerns remain for both the ewe and the fetuses. It should also be noted that some processing plants, and certain provinces, may impose financial penalties for the delivery of pregnant animals at a slaughter establishment.

Lambs: Lambs with an unhealed or infected navel are unfit for transport, and restrictions applicable to unfit animals apply. Lambs with a healed navel that are 8 days of age or less may be transported but only if all requirements set out in section 141 of the *Health of Animals Regulations* (HAR) are met. Lambs of 9 days of age and older that are not fully weaned must not be confined in a conveyance for more than 12 hours and must be provided with feed, water, and rest within 12 hours of the last time they received them.

REQUIREMENTS

Unfit animals must not be transported (except under the direction of a veterinarian for the purpose of receiving veterinary care and only when all requirements for the transport of unfit animals are met). Refer to Appendix Q: Guidance for Transporting Sheep.

Compromised animals may be transported only under the conditions specified above (see preamble), and only directly to the nearest suitable location to receive care for their condition, or for prompt slaughter or euthanasia. Compromised animals must not be transported to auction markets or assembly yards. Refer to Appendix Q: Guidance for Transporting Sheep.

Sheep showing injury or obvious clinical signs of disease must not be sent to auction markets, sales, or other assembly centres.

Ewes must not be transported with an engorged udder, or if the udder is likely to become engorged prior to reaching the final destination.

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.

Producers must ensure ewes and ewe lambs that are shipped to slaughter facilities are unlikely to be pregnant.

Lambs must only be transported if they are free from signs of fever or disease and have a healed, uninfected navel (see Appendix Q: Guidance for Transporting Sheep).

Lambs that are 8 days of age or less must only be transported with special provisions and directly to their final destination (not through an auction or assembly yard).

Lambs that are not fully weaned, are subject to special transport requirements that must be complied with. Refer to section 143 of the *Health of Animals Regulations*.

RECOMMENDED PRACTICES

- a. assess, select and identify animals before the transport vehicle arrives to avoid delays in loading sheep
- b. identify less severe conditions early so that individuals can be treated or shipped, as appropriate, before the condition worsens
- c. have a system in place to identify compromised or unfit sheep early, with an appropriate management plan that is known and understood by all personnel.

8.4.2 Preparation of Sheep Prior to Loading

Good management before loading helps reduce stress, protects sheep's welfare, and ensures animals are in the best possible condition at loading. Proper preparation such as feeding, watering, milking when needed, and completing identification and paperwork, also supports smooth loading, avoids delays, and reduces the risk of welfare issues during transport.

REQUIREMENTS

Sheep that are incompatible must not be mixed.

Sheep must be fed within the five hours immediately before loading, unless the total expected confinement time on the vehicle is less than 24 hours from the time of loading.

Sheep must have access to water until loading.

Ensure that all sheep and lambs being shipped are identified with an approved Canadian Sheep Identification Program (CSIP) identifier.

Sheep transported loose must not wear ropes or collars.

RECOMMENDED PRACTICES

- a. select and identify sheep before the transport vehicle arrives to avoid delays in loading
- b. provide access to cool drinking water in assembly and holding pens
- c. sheep should be shipped with appropriate wool cover for the expected weather conditions.

8.4.3 Loading into Conveyance

Loading and unloading can be the most stressful aspects of transport (54). Any efforts by the shipper and the transporter to reduce stress during these times will improve welfare. The shipper is responsible for ensuring that the conveyance meets the legal requirements, including but not limited to being covered with sufficient suitable bedding material to absorb moisture, and reduce the risk of sheep slipping or falling. During loading operations, if any compromised or unfit sheep are observed, immediately separate them and manage them accordingly.

REQUIREMENTS

Shippers, including producers transporting their own animals, must confirm that the conveyance is in good repair, clean, and adequately bedded. The entire floor area and any ramps used must be fully covered with bedding.

Shippers, including producers hauling their own animals, must visually verify that compartments or the conveyance are not overcrowded.

All divider gates must be used as designed to properly separate animals and manage space.

Personnel involved in loading must ensure there is adequate airflow to prevent moisture buildup and excessive temperatures that could compromise sheep welfare.

RECOMMENDED PRACTICES

- a. complete all required documentation (e.g. livestock manifests, bills of lading, emergency contact information) before loading and provide it to the transporter so the vehicle can depart promptly once loading is complete
- b. sheep should be separated and moved in manageable groups based on the design and flow of the barn. The number of sheep per compartment, where applicable, should be discussed beforehand with the transporter.

8.4.4 Unloading on Farm or Feedlot

Despite careful selection and thorough preparation, some sheep may become compromised or unfit during confinement and transport. During unloading, sheep should be promptly assessed for signs of injury, illness, or distress. Any sheep identified as compromised at unloading should be moved to a designated recovery pen, and additional care provided as needed.

Non-ambulatory sheep must not be dragged while conscious or prodded in an attempt to force unloading. These animals must be euthanized in the conveyance prior to being unloaded. (Note: The secondary step may be performed off the conveyance, provided the animal is rendered insensible before being unloaded).

Once unloaded, sheep should be moved promptly into clean pens and provided with access to feed, water, and adequate rest.

In the days following transport, sheep may require closer monitoring to detect delayed onset of injury, illness, or other transport-related welfare concerns.

REQUIREMENTS

Non-ambulatory (downer) sheep must be euthanized before being unloaded from the conveyance. (Note: The secondary step may be performed off the conveyance, provided the animal is rendered insensible before being unloaded; see Section 9.2: Methods of Euthanasia).

Unfit sheep that are able to stand and walk unassisted must be unloaded individually, using methods that do not cause unnecessary suffering, injury, or death. If individual unloading cannot be carried out safely, the sheep must be rendered unconscious or euthanized while still in the conveyance.

RECOMMENDED PRACTICES

- a. competent, calm, and patient stock handlers should unload sheep using low-stress handling techniques
- b. sheep should be assessed during unloading for signs of injury, illness, or distress, and appropriate action taken as needed
- c. recently transported sheep should be monitored closely for dehydration, injury, or illness, particularly following long-distance transport.

Chapter 9 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. Euthanasia may be the most welfare-friendly outcome in certain scenarios; letting a suffering animal languish is not acceptable. Once the decision has been made to euthanize an animal, action must be initiated promptly to prevent the animal from suffering unnecessarily. It can be helpful to develop the euthanasia plan with the flock veterinarian to determine when euthanasia is necessary and what method is most appropriate.

Being well-informed on all aspects of euthanasia provides confidence to make timely decisions on when to euthanize an animal and the skills to perform the procedure competently (29).

9.1 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 or protocols for on-farm euthanasia of sheep should be developed in consultation with a veterinarian and include (see Appendix R: Sample On Farm Euthanasia Plan):

- identification of the person(s) that will be performing euthanasia
- euthanasia training
- access to proper and appropriately maintained equipment
- criteria to guide euthanasia decisions (see Appendix J: Euthanasia Decision Tree).

REQUIREMENTS

All stockpeople must recognize when an animal needs to be euthanized and take action according to a euthanasia plan (see Appendix K: Signs of Illness, Injury, and/or Pain in Sheep).

Sheep must be euthanized without delay if experiencing pain or distress with no reasonable expectation of improvement or where appropriate veterinary care is not feasible (see Appendix J: Euthanasia Decision Tree).

Producers not familiar or comfortable with euthanasia decision-making and/or methods must consult with a veterinarian, provincial sheep specialists, or provincial producer organization regarding euthanasia.

All farms with employees must have a written euthanasia action plan (see Appendix R: Sample On Farm Euthanasia Plan) for each phase of production that:

- indicates the criteria for deciding when to euthanize an animal
- the appropriate method(s)
- who is trained to do this task
- how to contact that person
- includes alternative timely options so that any caretakers who are not comfortable performing euthanasia do not have to euthanize animals.

All caretakers must be trained on the euthanasia plan.

RECOMMENDED PRACTICES

- a. consult with the flock veterinarian to develop and implement a euthanasia plan.

9.2 Methods of Euthanasia

Euthanasia must cause minimal to no stress and pain, and result in a rapid loss of consciousness followed by death without the animal regaining consciousness. Humane handling and restraint (refer to Section 7.1 – Handling, Grouping, and Moving Animals) are also important components of euthanasia.

When choosing a euthanasia method (refer to Table 9.1 – Acceptable Methods of Euthanasia for Sheep), consider (70):

- human safety and the safety of nearby animals (from either the equipment or animal)
- the ability to restrain or contain the animal for proper application of the procedure
- the mental well-being of the person performing the procedure and other stockpeople, including changes in attitudes or behaviours
- the skill of the stockperson performing the procedure
- biosecurity and potential spread of disease
- carcass disposal
- the potential need for brain tissue for diagnostic purposes, if necessary
- laws governing the use and possession of firearms.

Methods for Neonatal Euthanasia

Euthanasia of neonatal lambs (up to 5 days of age and under 9 kg) presents additional challenges and requires specific considerations compared to adult sheep. These challenges are largely related to the animals' small size, which can pose safety concerns for handlers, limit the range of suitable euthanasia methods, and increase the risk of inconsistent application. Additional considerations include the emotional and mental health impact on stockpeople during the busy lambing period. Despite these challenges, euthanasia remains the most humane option in situations where there is a predictable failure to thrive.

All methods outlined in Table 9.1 can be used to euthanize neonates, however, firearm use is generally not appropriate for neonatal lambs, as the animals' small size introduces significant safety risks for the operator and bystanders.

Because neonatal lambs are small and have relatively thin skull bones, several methods can be used to achieve humane euthanasia when performed correctly. Permissible methods include non-penetrating captive bolt (NPCB), penetrating captive bolt (PCB), and manual blunt force trauma (mBFT). All methods must result in immediate loss of consciousness followed by rapid and irreversible disruption of brain function.

NPCB devices deliver a controlled concussive force to the skull and are commonly used due to their consistency and repeatability. PCB devices, when appropriately selected for neonates and correctly applied, destroy brain tissue directly and can provide a rapid and reliable method of euthanasia. mBFT may also be effective; however, it is highly operator-dependent and can be difficult to apply with sufficient accuracy and consistency, creating greater potential risks to animal welfare.

Regardless of the method used, proper technique, adequate restraint, correct positioning, and operator competency are critical to ensure the procedure is performed effectively and humanely.

In many jurisdictions and guidance frameworks, there is a growing movement away from mBFT, as outcomes can vary depending on the individual performing the method, and the technique can be challenging to carry out confidently and reliably.

Although mBFT is still considered a permissible method for the euthanasia of neonatal lambs, the industry is encouraged to prioritize education and training on appropriate alternatives. Producers are encouraged to actively work toward identifying and adopting alternative euthanasia methods that can be applied safely, consistently, and humanely.

The following considerations are key for neonatal lamb euthanasia:

- appropriate restraint in a manner that prevents both injury to those performing the procedure and damage to equipment
- do not euthanize lambs directly on concrete or steel floors
- restrain the lamb with an appropriate device (e.g., pipe, trough, restraint bag) and technique (see Appendix S: Anatomical Landmarks for Euthanasia)
- be familiar with the correct anatomical positions on the skull for successful stunning (see Appendix S: Anatomical Landmarks for Euthanasia)
- be sure to use a secondary method to ensure death has occurred.

Table 9.1 Acceptable methods of euthanasia for sheep.

Method	Permissible for:	Procedure and Equipment
Firearm	All animals	**Canada's firearms laws and regulations apply Minimum of .22 caliber firearm using "long-rifle" hollow-nosed ammunition and .22 magnum for horned animals; or shotgun with appropriate ammunition (see Appendix S: Anatomical Landmarks for Euthanasia).
Penetrating captive bolt* followed by a secondary step	All animals	Use appropriate cartridge, charge and bolt length for the animal (see manufacturer's manual). Safely restrain the animal's head. The captive bolt must be placed directly in contact with the head. A secondary step is required. See Appendix S: Anatomical Landmarks for Euthanasia.
Drugs approved for euthanasia (e.g., barbiturates)	All animals	Must be administered by a veterinarian. Carcass contains hazardous drugs and cannot be consumed by people or animals. Extra precautions must be taken for safe disposal.
Non penetrating captive bolt*, followed by a secondary step	Lambs under 15 kg (33 lb)	Use appropriate cartridge and charge for the animal (see manufacturer's manual). Safely restrain the animal's head. The captive bolt must be placed directly in contact with the head. Confirm insensibility then follow with immediate bleeding out to ensure death
A secondary step is required when euthanizing by captive bolt. Secondary steps can only be performed on an animal that is confirmed to be unconscious. It is inhumane to perform these steps on a conscious animal. A secondary step must be chosen in consultation with the flock veterinarian, outlined in the euthanasia protocol, and only performed following veterinary advice and training. The only acceptable secondary steps are: • exsanguination by severing a major artery, • pithing (destruction of the brain tissue using a tool), or • rapid intravenous or intracardiac injection of a concentrated solution of potassium chloride or magnesium sulfate.		

**Captive bolt guns specifically designed for euthanasia are available and should be used according to manufacturer's instructions.*

REQUIREMENTS

An acceptable method (see Table 9.1) for euthanizing sheep must be used. Manual blunt force trauma (mBFT) is a permissible method of euthanasia only when all of the following criteria are met:

- when performed correctly
- for lambs under 5 days of age (or 9 kg)
- a secondary step follows the application of mBFT
- when no other option of neonatal euthanasia is available.

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 equipment used for euthanasia, such as firearms or captive bolt devices must be maintained, stored and used 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 is likely to occur.

RECOMMENDED PRACTICES

- a. restrain as necessary for euthanasia; choose the safest and least stressful method of restraint possible
- b. farms currently using mBFT for euthanizing neonatal lambs should be actively seeking alternative methods to use in the euthanasia plan.

9.3 Confirmation of Loss of Sensibility and 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 (71). It is essential that sheep being euthanized are rendered insensible immediately and remain so until dead.

An insensible animal may have involuntary movements (e.g., paddling or kicking of the legs, neck flexing). To assess if the animal is insensible, look for a lack of corneal reflex (no response when the eyeball is touched). If a corneal reflex is present the method of euthanasia must be repeated immediately.

Unlike loss of sensibility, death is not immediate; it results from respiratory and cardiac failure, which may take several minutes. Absence of movement alone is not an indicator of death. The following indicators are therefore used to confirm death within 5 minutes following application of the euthanasia method:

- lack of heartbeat
- lack of breathing

- dilated pupils (not to be used as a stand-alone indicator)
- lack of corneal reflex
- graying of mucous membranes (gums, inner eyelids).

REQUIREMENTS

Sheep must be assessed for insensibility immediately after stunning. A sheep is considered unconscious when there is a lack of corneal reflex (i.e. no response when the eyeball is touched).

If a corneal reflex is observed, the method of euthanasia must be reapplied before performing a secondary step.

Before moving or leaving the animal, death must be confirmed using all of the following indicators:

- absence of a heartbeat within 5 minutes of the procedure
- lack of eye movement when the eyeball is touched (corneal reflex)
- cessation of respiratory movement within 5 minutes of the procedure
- pupils fixed and dilated.

If death does not occur within 5 minutes, the firearm shot must be repeated, or the secondary step reapplied.

Carcass disposal must be in accordance with applicable federal, provincial, and/or municipal regulations (see Section 7.13 Managing Deadstock).

Chapter 10 On-farm Slaughter

Sheep and lambs may be slaughtered on-farm (or in places other than provincially or federally inspected facilities) for personal consumption, or for farm gate sales where provincial regulations permit. Producers must ensure all applicable regulations are followed if slaughtering on the farm.

Captive bolt devices and firearms when followed by a bleeding out can both be used for on-farm slaughter (as per euthanasia methods outlined in this chapter) when the animal is considered suitable for human consumption. Both are humane methods of slaughter.

REQUIREMENTS

All applicable municipal, provincial, and federal regulations and guidance must be followed if slaughtering on farm.

Persons performing on-farm stunning and slaughter must have the relevant knowledge, experience, skills, and tools to achieve death as rapidly as possible.

Sheep must be appropriately restrained during the procedure but not until the person performing the slaughter is ready.

Sheep must be stunned prior to on-farm slaughter.

The only acceptable methods of slaughter are captive bolt guns and firearms followed by bleeding out.

Sheep must be monitored for loss of consciousness and death as in Section 9.3 – Confirmation of Loss of Sensibility and Death.

Death must be confirmed before any dressing procedures are conducted.

Inverting or hanging sheep while they are conscious is prohibited.

A standard operating procedure for on-farm slaughter must be included in the euthanasia action plan of the farm (see Appendix R: Sample On Farm Euthanasia Plan).

If non-stun slaughter is to be done, sheep must be sent to a licensed abattoir with personnel trained and equipped to do this method and with appropriate oversight, handling systems, equipment, and monitoring.

References

- 1) Canadian Sheep Federation (CSF). n.d. Virtual Tool Box (Housing Section). Available at: <https://www.cansheep.ca/resources> (accessed June 2026).
- 2) Dwyer, C.M. (2008). Farming systems for sheep production and their effects on welfare. In: Dwyer, C.M. (Ed.), *The Welfare of Sheep*. Springer, Dordrecht, The Netherlands. DOI: 10.1007/978-1-4020-8553-6_6.
- 3) Schoenian, S. 2018. Heat stress in sheep and goats. Small Ruminant Info Sheet. University of Maryland. Available at: <https://www.sheepandgoat.com/heatstress> Accessed: June, 2026.
- 4) Waghorn, G.C., Davis, G.B., and Harcombe, M.J. 1995: Specification of pen rail spacing and trough heights to prevent escape and enable good access to feed by sheep during sea shipments from New Zealand, *New Zealand Veterinary Journal*, 43:6, 219-224
- 5) Cockram, M.S. and Hughes, B.O. 2011. Health and Disease. Chapter 8. p 120-137. In *Animal Welfare*. 2nd edition. Edited by Appleby, M, Hughes, B, Mench, J and Olsson, A. CABI, Wallingford, UK.
- 6) Robertson, A. 2010. Ventilation for Livestock and Poultry Facilities. Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). Queen's Printer for Ontario, Toronto, Ontario. Publication 833E.
- 7) Phillips, C.J.C., Pines, M. K., Latter, M., Muller, T., Petherick, J.C., Norman, S.T., Gaughan, J.B. 2012. Physiological and behavioral responses of sheep to gaseous ammonia. *Journal of Animal Science*. 90:5 1562-1569.
- 8) WorkSafe BC. 2026. Table of Exposure Limits for Chemical and Biological Substances in Guidelines Part 5. Available at: <https://www.worksafebc.com/en/resources/health-safety/ohsr-searchable/table-exposure-limits-chemical-biological-substances> Accessed June, 2026
- 9) Schoenian, S. 2011. Sheep Behaviour in Sheep 201: A Beginner's Guide to Raising Sheep. Available at: <https://www.sheep101.info/201/behavior.html> Accessed: June, 2026.
- 10) Boissy, A., and Dumont, B. 2002. Interactions between social and feeding motivations on the grazing behaviour of herbivores: sheep more easily split into subgroups with familiar peers. *Applied Animal Behaviour Science*, 79:3, 233-245
- 11) Kendrick K. M., Da Costa A. P., Leigh A. E., Hinton M. R. and Peirce J. W. 2001. Sheep don't forget a face. *Nature* 414, 165-166.
- 12) Tate A. J., Fischer H., Leigh A. E. and Kendrick K. M. 2006. Behavioural and neurophysiological evidence for face identity and face emotion processing in animals. *Philosophical Transactions of the Royal Society B-Biological Sciences* 361, 2155-2172.
- 13) Stolba, A., Lynch, G.N., Hinch, J.J., Adams, D.B., Munro, R.K. and Davies, H.I. 1990. Social organisation of merino sheep of different ages, sex and family structure. *Applied Animal Behaviour Science*. 27(4): 337-349.
- 14) FASS. Guide for the Care and Use of Agricultural Animals in Research and Teaching, Third Edition, January 2010. Available at: https://www.fass.org/images/science-policy/Ag_Guide_3rd_ed.pdf Accessed: June, 2026

- 15) Parrott, R.F. 1990. Physiological responses to isolation in sheep. *Social Stress in Domestic Animals* (ed. R. Zayan, R. Dantzer). Kluwer Academic Publishers, Dordrecht, Netherlands: 1990. 212 -226.
- 16) Baldwin, B.A., and Start, I.B. 1981. Sensory reinforcement and illumination preference in sheep and calves. *Proc R Soc Lond B Biol Sci.* 211(1185):513-26.
- 17) Schoenian, S. 2011. Housing for Sheep in Sheep 201: A Beginner's Guide to Raising Sheep. Available at: <http://www.sheep101.info/201/housing.html> Accessed: June, 2026
- 18) Russel, A.J.F. (1984). Body condition scoring of sheep. *In Practice*, 6(3), 91–93. DOI: 10.1136/inpract.6.3.91
- 19) Government of New Zealand, Ministry of Agriculture and Forestry. Body Condition Score Key Messages. Available at <http://maxa.maf.govt.nz/sff/about-projects/search/08-026/body-condition-score-key-messages.pdf> Accessed March 4, 2013.
- 20) Ontario Sheep Marketing Agency. Chapter 7: Digestion and Nutrition from Introduction to Sheep Production in Ontario. Page 110. Guelph, ON. Available at: <https://www.ontariosheep.org/media/2d3e1dlt/g7-digestive-system-and-nutrition-2014.pdf> Accessed June, 2026.
- 21) Van Soest, P.J., 1994. Nutritional Ecology of the Ruminant. Cornell Publishing Associates. Itahaca, USA. Chapter 15. pg. 230 Accessed February 6th, 2013.
- 22) Alberta Lamb Producers and Alberta Goat Association. 2018. Sheep and Goat Management in Alberta: Nutrition. Available at: <https://ablamb.ca/wp-content/uploads/2026/02/Nutrition-module-2018-web.pdf> Accessed June, 2026.
- 23) Ontario Sheep Marketing Agency, Sheep Production Manual. Chapter 8: Flock Health – Good Management Practices. p. 126. Available at: <https://www.ontariosheep.org/media/w1bde2ye/h8-flock-health-2014.pdf> Accessed: June, 2026.
- 24) Lovatt, F. 2004. Farm Animal Practice: Developing flock health plans. *In Practice* 26(6) 290-295, doi:10.1136/inpract.26.6.290. <https://doi.org/10.1136/inpract.26.6.290>
- 25) Alberta Lamb Producers and Alberta Goat Association. 2018. Sheep and Goat Management in Alberta: Health Management. Available at: <https://ablamb.ca/wp-content/uploads/2026/02/Health-module-2018-web.pdf> Accessed June 2026
- 26) Australian Wool Innovation. 2019. Managing Breech Flystrike. Available at: https://www.wool.com/globalassets/wool/sheep/research-publications/welfare/non-invasive-management-practices/gd2428-2019-managing-flystrike-manual_11.pdf Accessed: June, 2026
- 27) Wenger, I. 2005. A Guide to Parasites in Sheep. Alberta Sheep and Wool Commission. Available at: <https://ablamb.ca/wp-content/uploads/2026/02/Guide-To-Parasites-In-Sheep.pdf> Accessed June, 2026
- 28) Kaler, J., Wassink, G.J., Green, L.E. (2009) The inter- and intra reliability of a locomotion scoring scale for sheep. *The Veterinary Journal.* 180:189-194. DOI: 10.1016/j.tvjl.2007.12.028

- 29) Sheep Code of Practice Scientists' Committee (2012) Code of Practice for the Care and Handling of Sheep: Review of Scientific Research on Priority Issues. Lacombe AB: National Farm Animal Care Council. Available at: www.nfacc.ca
- 30) Grandin, T. (2018). Behavioral principles of livestock handling: With 1999, 2002, 2010, 2014, 2015, 2016, 2017, and 2018 updates on vision, hearing, and handling methods in cattle and pigs. Available at: <https://www.grandin.com/references/new.corral.html> Accessed June, 2026
- 31) Shulaw, W.P. 2005. Sheep Care Guide. American Sheep Industry Association. Available at: <https://www.sheepusa.org/wp-content/uploads/2021/06/Sheep-Care-Guide-2021-web.pdf> Accessed June, 2026
- 32) Dwyer, C.M. (2008). Sheep senses, social cognition and capacity for consciousness. In: Dwyer, C.M. (Ed.), *The Welfare of Sheep*. Springer, Dordrecht, The Netherlands. DOI: 10.1007/978-1-4020-8553-6_4.
- 33) Davis, H., Norris, C. and Taylor, A. 1998. Wether ewe know me or not: the discrimination of individual humans by sheep. *Behavioural Processes* 43 27–32
- 34) Peirce, J.W., Leigh, A.E., da Costa, A.P.C. and Kendrick, K.M. (2001). Human face recognition in sheep: Lack of configurational coding and right hemisphere advantage. *Behavioural Processes*, 55:13–26. DOI: 10.1016/S0376-6357(01)00158-9.
- 35) Canadian Food Inspection Agency (CFIA) (2026) Identification and traceability – Guide for livestock producers and owners. Available at: https://inspection.canada.ca/en/about-cfia/transparency/consultations-and-engagement/completed/identification-and-traceability/guide-livestock-producers-and-owners#a2_6 Accessed: June, 2026.
- 36) Department for Environment, Food & Rural Affairs (DEFRA). (2015) Best sheep and goat tagging practice. Available at: <https://www.gov.uk/government/publications/sheep-and-goat-tagging-best-practice/best-sheep-and-goat-tagging-practice>. Accessed: June, 2026.
- 37) Ontario Sheep Marketing Agency, Sheep Production Manual. Chapter 9: Shearing and Foot Trimming. p. 193. Available at: <https://www.ontariosheep.org/media/0condpjq/i9-shearing-and-foot-trimming-2014.pdf>. Accessed: June, 2026.
- 38) Alberta Lamb Producers. (2018). Shearing. Alberta Lamb Producers. Available at: <https://ablamb.ca/wp-content/uploads/2026/02/Shearing-2018-web.pdf> Accessed: June, 2026.
- 39) Schoenian, S. 2011. Sheep hoof health and management. University of Maryland Extension Small Ruminant Program. Powerpoint presentation. Available at: <http://www.slideshare.net/schoenian/sheep-hoof-health-and-management> Accessed: June, 2026.
- 40) Schoenian, S. (2012). The welfare of docking and castrating lambs. University of Maryland Extension. Available at: www.sheepandgoat.com/articles/welfaredockcast.html Accessed: June, 2026.
- 41) Alberta Lamb Producers. (2023). Pain control surrounding castration and tail docking in sheep (Technical note). Available at: <https://acerconsult.ca/wp-content/uploads/2023/09/ABLambTechnicalNote-2.pdf> Accessed: June, 2026.

- 42) Canadian Veterinary Medical Association. (2024). Position Statement: Castration of Cattle, Sheep, and Goats. Available at: <https://www.canadianveterinarians.net/policy-and-outreach/position-statements/statements/castration-of-cattle-sheep-and-goats/> Accessed: June, 2026.
- 43) Federation of Animal Science Societies. (2010). Sheep and Goats. Pages 129-142 in Guide for the Care and Use of Agricultural Animals in Research and Teaching, 3rd ed. Available: https://www.fass.org/images/science-policy/Ag_Guide_3rd_ed.pdf Accessed: June, 2026.
- 44) Canadian Sheep Federation (n.d.) The Virtual Tool Box - Breeding. Available at: https://37d5fcb5-9a95-4c49-b6f6-1794aaca1f8.filesusr.com/ugd/21f840_8626cba7bc6f401b8ceeb6bc7659ae86.pdf Accessed: June, 2026.
- 45) Ontario Sheep Marketing Agency. (2014). (Chapter 5: Genetics and breeding. In Sheep Production Handbook. Available at: <https://www.ontariosheep.org/media/vodloxve/e5-genetics-and-breeding2014.pdf>. Accessed on: June, 2026.
- 46) Ontario Sheep Marketing Agency. (2014). Chapter 6: Reproduction and lambing. In Sheep Production Handbook. Guelph, ON: Ontario Sheep Marketing Agency. Available at: <https://www.ontariosheep.org/media/ck5hesi1/f6-reproduction-and-lambing-2014.pdf> Accessed: June, 2026.
- 47) Alberta Lamb Producers. (n.d.) Managing Rams for Superior Performance (Building Better Lambs Fact Sheet 4). Available at: <https://sheepcentral.ca/images/documents/factsheets/BBL4-Managing-Rams-Screen.pdf> Accessed: June, 2026.
- 48) Greinger, S.P. 2006. Livestock Update: Ewe Management Tips: Mid and Late Gestation. Virginia Cooperative Extension. Available at: www.sites.ext.vt.edu/newsletter-archive/livestock/aps-06_11/aps-381.html Accessed: June, 2026.
- 49) Mellor D. (1990) Meeting colostrum needs of newborn lambs. In Practice 12:242-244.
- 50) Eales F.A. (1982) Detection and treatment of hypothermia in newborn lambs. In Practice 4:20-22.
- 51) Sevi A., Casamassima D., Pulina G. & Pazzona A. (2007) Factors of welfare reduction in dairy sheep and goats. Italian Journal of Animal Science 8 (suppl. 1):81-101.
- 52) Department for Environment, Food & Rural Affairs (DEFRA). (2023) Code of recommendations for the welfare of livestock: sheep. London, UK: Department for Environment, Food & Rural Affairs. Available at: <https://www.gov.uk/government/publications/code-of-recommendations-for-the-welfare-of-livestock-sheep/sheep-and-goats-welfare-recommendations#milk-sheep> Accessed: June, 2026.
- 53) Canadian Food Inspection Agency (2020) Health of Animals Regulations: Part XII (Transport of Animals). Available at: https://laws-lois.justice.gc.ca/eng/regulations/C.R.C._c._296/index.html. Accessed: June, 2026.
- 54) Scientific Committee on Animal Health and Animal Welfare. (2002). The Welfare of Animals during Transport (details for horses, pigs, sheep and cattle). European Commission. Available at: https://food.ec.europa.eu/document/download/f5104969-2b3c-4c32-8e47-511634a449be_en Accessed: June, 2026.
- 55) British Columbia Ministry of Agriculture. (2015). Emergency Management Guide for B.C. Small Mixed Farms. Available at: <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and->

industry/agriculture-and-seafood/farm-management/emergency-management/900600-4_em_small_mixed_farm_guide.pdf Accessed: June, 2026.

- 56) Alberta Veterinary Medical Association. (2022). Veterinarian-client-patient relationship (VCPR) – Professional standard. Available at: https://abvma.in1touch.org/document/5862/VCPR%20-%20Professional%20Standard_revised%20Jan%2018%202023.pdf Accessed: June 2026.
- 57) Krofel, M., Černe, R., & Jerina, K. (2011). Effectiveness of wolf (*Canis lupus*) culling as a measure to reduce livestock depredations. *Zbornik gozdarstva in lesarstva*, 95, 11–21.
- 58) McManus, J.S., Dickman, A.J., Gaynor, D., Smuts, B.H., & Macdonald, D.W. (2015). Dead or alive? Comparing costs and benefits of lethal and non-lethal human–wildlife conflict mitigation on livestock farms. *Oryx*, 49(4), 687–695.
- 59) Lennox, R.J., Gallagher, A.J., Ritchie, E.G., & Cooke, S.J. (2018). Evaluating the efficacy of predator removal in a conflict-prone world. *Biological Conservation*, 224, 277–289.
- 60) Peebles, K.A., Wielgus, R.B., Maletzke, B.T., & Swanson, M.E. (2013). Effects of remedial sport hunting on cougar complaints and livestock depredations. *PLoS ONE*, 8(11), e79713.
- 61) Santiago-Ávila, F.J., Cornman, A.M., & Treves, A. (2018). Killing wolves to prevent predation on livestock may protect one farm but harm neighbors. *PLoS ONE*, 13(1), e0189729.
- 62) Santiago-Ávila, F.J., Cornman, A.M., & Treves, A. (2018). Correction: Killing wolves to prevent predation on livestock may protect one farm but harm neighbors. *PLoS ONE*, 13(12), e0209716.
- 63) Stone, S.A., Breck, S.W., Timberlake, J., Haswell, P.M., Najera, F., Bean, B.S., & Thornhill, D.J. (2017). Adaptive use of nonlethal strategies for minimizing wolf–sheep conflict in Idaho. *Journal of Mammalogy*, 98(1), 33–44.
- 64) Manitoba Natural Resources and Northern Development. (n.d.). Coexistence of livestock and wild predators. Available at: https://www.manitoba.ca/nrnd/fish-wildlife/pubs/fish_wildlife/coexistence_of_livestock_and_wild_predators.pdf. Accessed on: June, 2026.
- 65) Canadian Veterinary Medical Association (CVMA). (2021). Tail docking of sheep (Position statement). Available at: <https://www.canadianveterinarians.net/policy-and-outreach/position-statements/statements/tail-docking-of-sheep/> Accessed on: June 10, 2026.
- 66) Palmer, C. (2018). Reproduction. In *Sheep and Goat Management in Alberta*. Alberta Lamb Producers and Alberta Goat Association. Available at: <https://ablamb.ca/wp-content/uploads/2026/02/ALP-Reproduction-module-2018-web.pdf> Accessed: June, 2026.
- 67) Sheep Code of Practice Scientists' Committee (2026) Code of Practice for the Care and Handling of Sheep: Review of Scientific Research on Priority Issues. Lacombe AB: National Farm Animal Care Council. Available at: www.nfacc.ca.
- 68) Gonyou, H.W. and Stookey, J.M. (1983). Use of lambing cubicles and the behavior of ewes at parturition. *Journal of Animal Science*, 56(4), pp.787–791. Available at: <https://pubmed.ncbi.nlm.nih.gov/6853379/>
- 69) Gonyou, H.W. and Stookey, J.M. (1985). Behavior of parturient ewes in group-lambing pens with and without cubicles. *Applied Animal Behaviour Science*, 14(2), pp.163–171. Available at: [https://doi.org/10.1016/0168-1591\(85\)90027-9](https://doi.org/10.1016/0168-1591(85)90027-9)

- 70) Alberta Lamb Producers. (2017). On Farm Euthanasia. Available at: <https://ablamb.ca/wp-content/uploads/2026/02/Sheep-Euthanasia-Manual-final.pdf> Accessed: June, 2026.
- 71) American Veterinary Medical Association (AVMA). (2020). AVMA Guidelines for the Euthanasia of Animals: 2020 Edition. Schaumburg, IL: American Veterinary Medical Association. Available at: <https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf> Accessed: June, 2026.

DRAFT

Appendix A: Sample Welfare Policy

Farm Name: _____

Owner/Manager: _____

Date: _____

Our Commitment to Our Sheep

We are committed to responsible care and handling of the sheep on this farm. That means the animals in our care are healthy, safe, and well looked after.

We do this by:

- making sure they have enough to appropriate feed to meet their needs
- Access to clean palatable water to meet their needs
- giving them a comfortable, safe place to live and rest
- handling them calmly and with care
- keeping them with other sheep

We take our responsibilities seriously. We check our sheep regularly and, if something isn't right or could be improved, we take steps to address it as soon as possible.

Additional Notes (optional):

Signature: _____

Date: _____

Appendix B: Evacuate or Shelter in Place

Should I Stay or Should I Go? Livestock Evacuation vs. Shelter-in-Place Planning

Be Ready, Be Set, and...



- Are you under an official alert or evacuation order?
- Is there enough warning time to move animals safely?
- Who is responsible for making the decision? Is everyone informed?
- Have you made contact with local authorities? Are they aware of your plans?

Shelter-in-Place



- Is there a safe refuge area on the farm (barns, pens, pastures) protected from the hazard? Is there enough time to safely move them?
- Do you have enough feed, water, bedding, and veterinary supplies for the expected duration?
- Do you have reliable power or a backup generator — and sufficient fuel?
- Will trained staff be available and safe to stay on site?
- Do you have dependable communications (cell, radio)?
- Are you and your team prepared to be self-sufficient and isolated?
- Can you gather and load animal from this site if evacuation becomes necessary?

Evacuate



- Have you located and prearranged an off-site relocation area? Do you have a pre-arranged buddy farm or alternate location outside the hazard area ready — and does it meet special needs (e.g., milking, lambing) if required?
- Do you have transport capacity (trailers, trucks, equipment, trained handlers)?
- Are transport routes mapped and currently safe under the hazard conditions?
- What biosecurity risks will you face?
- Do you have concerns re: closed flock/high-health status, organic status etc. being negatively impacted?
- Are weather and road conditions suitable for animal transport?



Risk & Contingency Factors



- Have you planned for possible delays or inability to reach the destination (traffic stoppages, road closures) and identified transfer-of-care options? How will livestock fare if trucks are stopped for long periods (e.g., weather impact)?
- Have you evaluated stress, injury risk, and heat exposure during transport?

Appendix C: Sample Emergency Telephone List

Contact	Phone Number	Emergency / After Hours
Owner / Manager		
Veterinary Clinic		
Police		
Fire Department		
Electrical Company		
Poison Control Centre		
Ventilation & Heating Service		
Gas Heating Service		
Water System Repair		
Feeding System Service		
Plumber		
Electrician		
Alarm System Company		
Feed Supplier		
Milking System Service		

Farm Information

Farm Name: _____

Address: _____

Directions for Emergency Responders:

Primary Contact: _____

Premises ID (PID): _____

*** Source: Adapted from the Code of Practice for the Care and Handling of Goats (2022). Available at <https://www.nfacc.ca/codes-of-practice/goats>*

Appendix D: Mapping Barns and Surrounding Areas for Fire Services

A map of the barn and its surroundings must be drawn and kept readily accessible for emergency crews. A copy of the farm map should be sent to your local fire service and another one should be put in a sealed container near the road upon evacuation from the farm. The map should include:

- All buildings, including fan openings, windows, doors, floor drains and their outlets
- Location of animals on the site
- Supplies (e.g., fire extinguishers, first aid kits, tools, protective clothing, absorbent materials)
- Electrical service panels
- Hydro, gas, and water shutoffs
- Generator(s), hookups for generator(s)
- All fixed outside equipment
- Compressed gas storages (e.g., oxygen, acetylene, and air tanks)
- Propane and fuel tanks
- Anhydrous ammonia storage
- Location of firearms, ammunitions and/or captive bolt cartridges
- Water well location(s), including abandoned and unused wells
- Water source for firefighting (may be the nearest tank fill location)
- Possible contamination sources (e.g., pesticide storages, fertilizer storages, petroleum products storage, septic systems, manure storages, barnyards, pesticide mixing facilities)
- Expected pathways for water runoff (e.g., where will the water flow when a fire is put out?)
- Perimeter fences, gates, tile inlets, catch basins, surface water
- Access routes to outdoor containment areas where animals can be moved if evacuated (i.e., pastures or lots).

Appendix E: Heat Stress Factors

A complex range of climatic and animal factors influence susceptibility to heat stress. The following table provides details of climatic and animal factors that may affect an animal's risk of heat stress.

	Factor	Influence on Heat Stress
Climatic Factors	Ambient temperature	Temperatures close to or above the sheep's body temperature will limit its ability to lose heat via convective cooling.
	Relative humidity	Increased humidity reduces an animal's ability to lose heat through evaporation by panting.
	Solar radiation	Heat produced by solar radiation can significantly exceed the metabolic heat produced by the animal.
	Wind speed	Heat stress is increased in calm air conditions because convective heat loss is dramatically decreased.
	Night-time temperature	High night-time temperatures prevent loss of heat gained during the day, increasing the risk of heat stress.
Animal Factors	Fleece	Adequate protection from heat is only conferred when the fleece length reaches 30–40mm. In sheep with shorter wool, radiant energy easily passes through to the skin.
	Breed	Breeds originating from cool regions, with compact bodies, short legs and necks, and small ears, are more susceptible to heat stress.
	Age	Lambs are very susceptible to heat stress because of their high metabolic heat production, higher normal respiration rate, large surface area relative to their mass and limited fleece length.
	Pregnancy	The increase in metabolic heat production during late gestation can predispose ewes to increased heat stress.

If a combination of the factors in the above table is present, heat stress is more likely.

Adapted from: Agriculture Victoria (2020). *Signs and management of heat stress in sheep*. Available at: <https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter/sheep-notes-autumn-2020/signs-and-management-of-heat-stress-in-sheep>

Appendix F: Livestock Safety Index

The Livestock Temperature Humidity Index* (THI, see 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 (Canadian Centre for Occupational Health and Safety), available at: https://www.ccohs.ca/oshanswers/phys_agents/humidex.html

Appendix G: Panting Index

An easy-to-use visual sign that sheep are becoming heat stressed is a change in the way they are breathing. This is because 65% of the heat loss in sheep occurs by panting.

The degree to which sheep are panting is an important indicator of the extent to which they are suffering from heat stress:

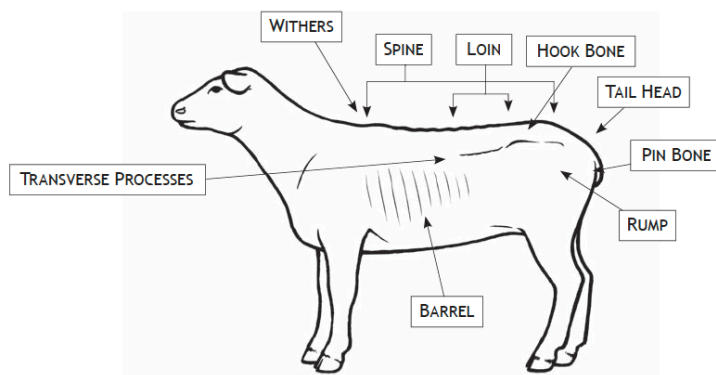
- Mild heat stress – sheep may show mild to fast panting, but with a closed mouth. Rapid chest movements will be easily observable.
- Moderate heat stress – sheep show fast panting, progressing to mouth slightly open, but the tongue is not extended beyond the lips. Rapid chest movements will be easily observable.
- Severe heat stress – rapid, open-mouth panting will be seen, with the neck extended, head held up and tongue extended.
- Extreme heat stress – open-mouth panting will be seen, with the tongue fully extended and the head often lowered. Deeper breathing will occur, with a reduction in the panting rate for short periods.



Source: Photographs and selected text excerpts reproduced from Agriculture Victoria (2020), *Signs and management of heat stress in sheep*. Available at: <https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter/sheep-notes-autumn-2020/signs-and-management-of-heat-stress-in-sheep>

Appendix H: Body Condition Scoring

Illustration of a Sheep with a BCS score of 2².



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. BCS describes the condition of a sheep, is convenient, and is much more accurate than a simple eye appraisal.

A BCS 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 BCS.

CROSS SECTION OF THE LOIN AREA

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.

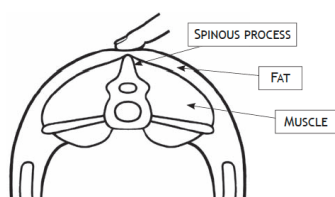


FIGURE 2. Feel for the tips of the transverse processes.

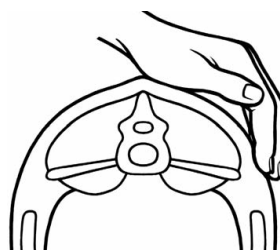
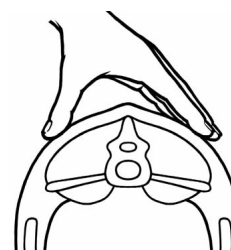


FIGURE 3. Feel for fullness of muscle and fat cover.



²The source of the original 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 SCORES FOR SHEEP

Overview of all the body condition scores for Sheep

BCS 1

WHOLE BODY

- Emaciated
- Boney processes can be easily felt

SPINE

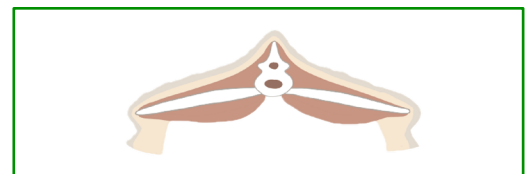
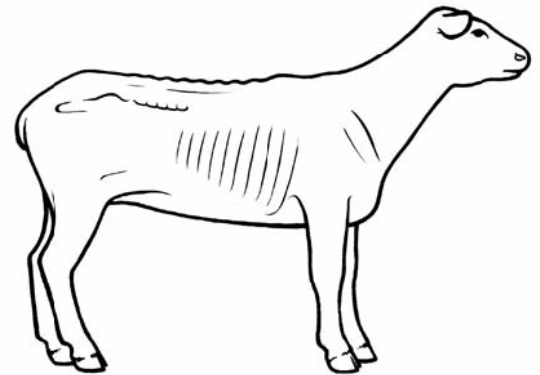
- Dorsal spinous processes are sharp and prominent
- Easily felt through skin

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

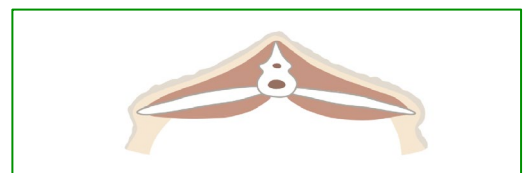
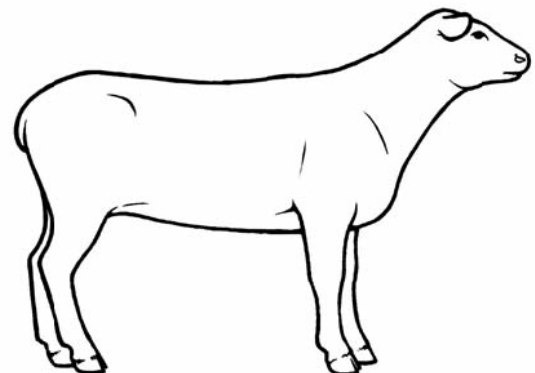
- Dorsal spinous processes still prominent, but not as sharp

LOIN

- Loin eye muscle fuller
- Virtually no fat cover

TRANSVERSE PROCESSES

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



Additional supporting images for BCS loin cross-sections added by the NFACC Sheep Code Development Committee (2026)

BCS 3

WHOLE BODY

- Average

SPINE

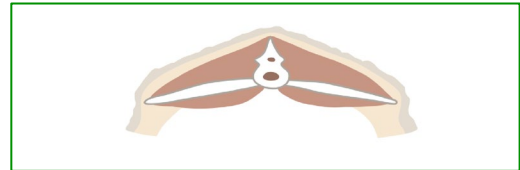
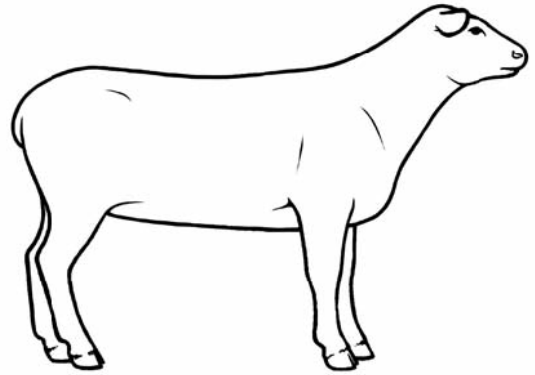
- Spinous processes smoother and less prominent
- Some pressure required to feel between them

LOIN

- Loin muscle full, some fat cover

TRANSVERSE PROCESSES

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



BCS 4

WHOLE BODY

- Fat
- Fat accumulations over tail head

SPINE

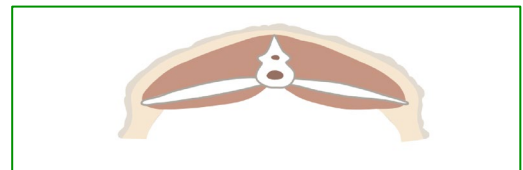
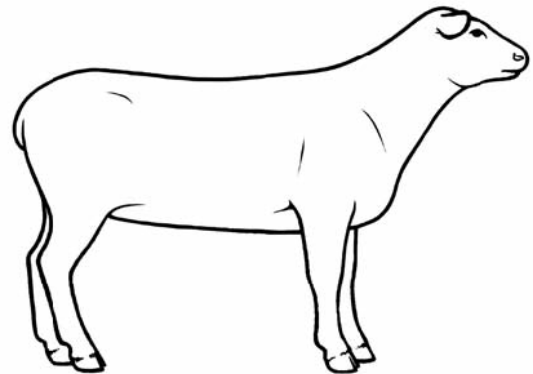
- Considerable pressure needed to feel dorsal spinous

LOIN

- Loin eye muscle full with discernible fat cover

TRANSVERSE PROCESSES

- Transverse processes can't be felt



Additional supporting images for BCS loin cross-sections added by the NFAACC Sheep Code Development Committee (2026)

BCS 5

WHOLE BODY

- Obese
- Fat pad over tail head

SPINE

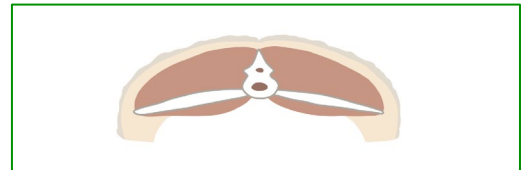
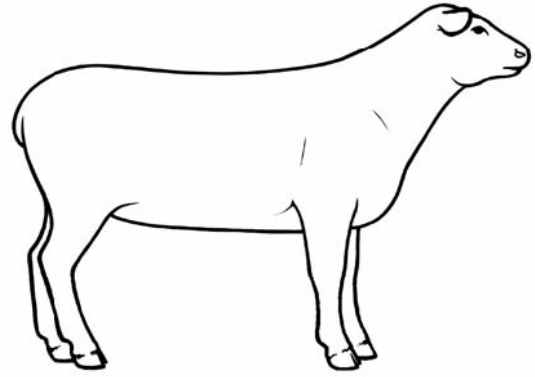
- Dorsal spinous processes can't be felt
- Depression often present where they would normally be felt

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.

For more information on body condition scoring, scan the QR codes to view instructional video guides.



Additional supporting images for BCS loin cross-sections added by the NFACC Sheep Code Development Committee (2026)

Appendix I: Accessing Veterinary Services

The organizations listed below regulate the practice of veterinary medicine or administer veterinary licensing within their respective jurisdictions and may be able to assist producers in locating veterinary services. Many maintain public registries or veterinarian search tools on their websites.

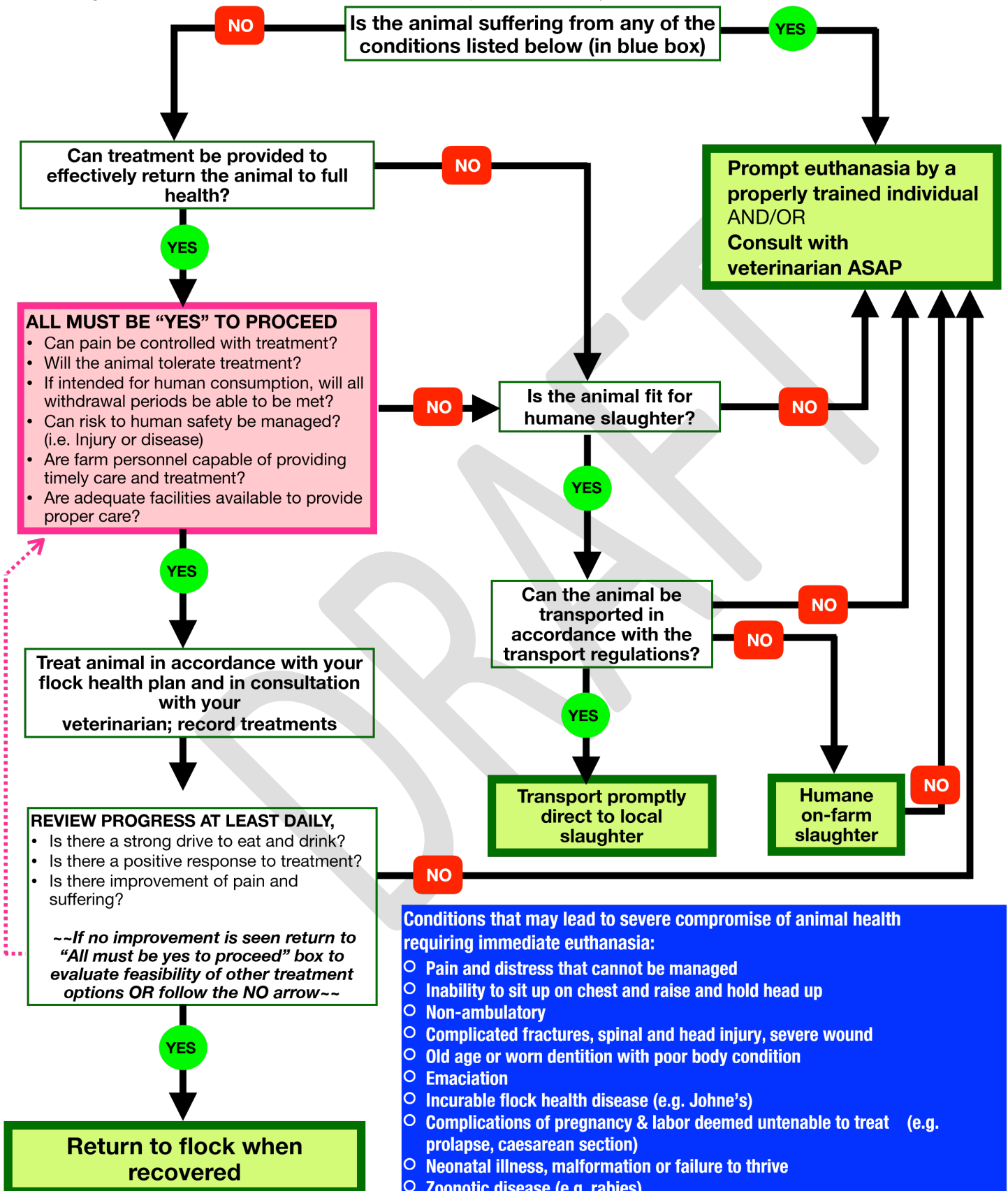
Province/Territory	Veterinary Regulatory Organization	Website
British Columbia	College of Veterinarians of British Columbia (CVBC)	https://www.cvbc.ca
Alberta	Alberta Veterinary Medical Association (ABVMA)	https://www.abvma.ca
Saskatchewan	Saskatchewan Veterinary Medical Association (SVMA)	https://www.svma.sk.ca
Manitoba	Manitoba Veterinary Medical Association (MVMA)	https://www.mvma.ca
Ontario	College of Veterinarians of Ontario (CVO)	https://www.cvo.org
Quebec	Ordre des médecins vétérinaires du Québec (OMVQ)	https://www.omvq.qc.ca
New Brunswick	New Brunswick Veterinary Medical Association (NBVMA)	https://nbvma-amvnb.ca
Nova Scotia	Nova Scotia Veterinary Medical Association (NSVMA)	https://www.nsvma.ca
Prince Edward Island	Prince Edward Island Veterinary Medical Association (PEIVMA)	https://www.peivma.com
Newfoundland and Labrador	Newfoundland and Labrador College of Veterinarians (NLCV)	https://www.nalvma.com
Northwest Territories	Government of Northwest Territories Veterinary Licensing Authority	https://www.hss.gov.nt.ca
Nunavut	Government of Nunavut Department of Health – Operations & Professional Practice	https://nuphysicians.ca/license-and-registration
Yukon	Government of Yukon – Veterinary Licensing Information	https://yukon.ca

Note: Veterinary regulatory structures vary among Canadian jurisdictions. In some provinces, veterinary regulation is administered by a veterinary college or veterinary medical association, while in some territories licensing and oversight functions are administered directly by government departments.

Source: Adapted from the Canadian Veterinary Medical Association (CVMA) Regulatory Bodies Directory. Available at: <https://www.canadianveterinarians.net/public-resources/regulatory-bodies/>

Appendix J: Euthanasia Decision Tree

A guide for when an animal is identified as sick, injured or unthrifty:



Appendix K: Signs of Illness, Injury, and/or Pain in Sheep

The following signs may indicate illness or injury in sheep, which may also indicate pain and distress.

Note – sheep may not vocalize when in pain.

Signs of changes to feed intake and digestion:

- Decreased appetite (e.g. not coming up to the feeder, standing at the feeder but not eating)
- Not chewing properly
- Excessive salivation
- Not chewing their cud (ruminating)
- Looking empty or sunken (flanks are sunk in and hook bones are easily seen)
- Manure stains on their fleece indicating diarrhea, with or without blood
- Straining to urinate or defecate
- Looking ‘too full’, especially on the left side (may indicate bloat)

Signs related to the respiratory system and face:

- Noisy breathing
- Rapid and shallow breathing
- Coughing
- Snotty nose
- Grunting
- Grinding teeth
- Lip curling
- Repeated ‘yawning’
- Exercise intolerance
- Facial expression (see Sheep Pain Facial Expression Scale)
- High FAMACHA score (see Figure 1)

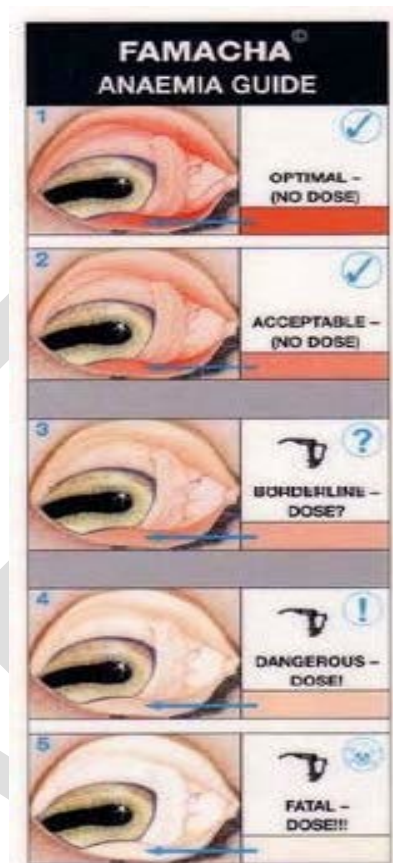


Fig 1. FAMACHA scoring
example of card

NOTE: FAMACHA© scoring should be conducted using an official FAMACHA© card and by individuals who have received appropriate training, as colour accuracy and proper scoring technique are essential for reliable assessment of anaemia associated with Haemonchosis.

Signs related to gait, posture, and movement:

- Lameness, odd gait, reluctance to move freely (e.g. favouring a leg, staggering, stiffness, circling, holding their head in an abnormal position, walking or resting on knees)
- Abnormal posture (e.g. arched back)
- Reluctant to stand or move when disturbed
- Slow to keep up with the group
- Separated from the group
- Remaining recumbent (i.e. down, non-ambulatory)
- Abnormal excitement, agitation, or restlessness (e.g. laying down and getting up repeatedly, shifting weight, circling, pacing, kicking at belly) or disturbed sleep patterns
- Guarding (altering posture to avoid moving or causing contact to a body part –e.g. not allowing lambs to nurse when mastitis occurs)

Signs related to appearance

- Abnormal appearance (e.g. swelling in the udder, inflammation of injured body parts)
- Abnormal discharges or odour

Other behavioural signs

- Depression (lack of response to normal stimuli)
- Excessive itchiness or wool chewing
- Biting, rubbing, scratching, or shaking a painful area

The following Sheep Pain Facial Expression Scale (SPFES) resource is reproduced from Alberta Lamb Producers. Source: Alberta Lamb Producers. *Sheep Pain Facial Expression Scale (SPFES)*. Available at: <https://ablamb.ca/wp-content/uploads/2026/02/SPFES-insert.pdf>. Original attribution and acknowledgements have been retained, see next pages.

Sheep Pain Facial Expression Scale *

Orbital Tightening: When tightening is not present, the eye is round in shape. As the muscles around the eye tighten, they become more prominent and the eye starts to narrow. If the eye closes more than half way it should be scored as present.



Not present = 0



Partially Present = 1



Present = 2

Cheek Muscle Tightening: When tightening is present, the muscle that runs from the corner of the mouth area along the jaw line and up to the cheek bone is more prominent. There may also be tightening from the cheek towards the ear along the edge of the eye.



Not present = 0



Partially Present = 1



Present = 2

Abnormal Lip & Jaw Profile: Normally, the corner of the mouth is turned upwards slightly. The lips become flattened as tension increases, reducing the 'smile' like feature. The chin and jaw line are rounded in shape when tension is not present. The line becomes straighter and curved inwards (concave) when tightening is present.



Not present = 0



Partially Present = 1



Present = 2

Abnormal Nostril & Muzzle Shape: Normally, a shallow 'U' shape is present between the nostril openings. The surrounding muzzle follows this 'U' shape. As the position becomes abnormal, the area between the nostrils (and the surrounding muzzle) appears increasingly 'V' shaped.



Not present = 0

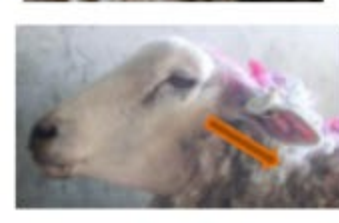


Partially Present = 1



Present = 2

Abnormal Ear Position: Normally, ears are held erect and the inner part of the ear is visible when viewed from the front. As the position becomes abnormal, the ears drop and turn towards the face, so the inner part of the ear is not visible. The ear may be held in a backwards position. Normal ear position will differ depending on breed type; however, the changes that occur are the same for all breeds.



Not present = 0



Partially Present = 1



Present = 2

Sheep Pain Facial Expression Scale (SPFES)

Animals experience pain as a result of disease, injury and some management procedures.

Why is it important to manage pain in livestock?

- Administering pain medication in combination with other treatments can speed healing time and lessen the drop in productivity due to disease or injury.
- It's the right thing to do. Handlers have a responsibility to ensure the well-being of animals in their care.
- Providing a high level of care to animals contributes to public acceptance of livestock farming.

The right thing to do, but...

It is often difficult to tell how much an animal is suffering. In some situations, outward signs of the injury or disease are obvious, but animals (particularly prey animals such as sheep) are stoic and frequently do not show overt signs of distress. Handlers may be unsure when the use of medications, such as non-steroidal anti-inflammatories (NSAIDs), is warranted. When medications are given, it may be difficult to assess how well they are working to relieve pain or resolve the problem.

A new tool for assessing pain:

Animals in pain do show reliable, if at times, very subtle signs of distress. A recently developed Sheep Pain Facial Expression Scale (SPFES) can help handlers accurately and objectively determine the degree of pain an animal is experiencing.* The SPFES was developed using animals with mastitis and foot rot, however, the expressions identified are common to other conditions that cause pain and distress in sheep.

- * Development of a facial expression scale using footrot and mastitis as models of pain in sheep. Appl. Anim. Behav. Sci. 176 (2016); 19-26. Krista M. McLennan, Carlos J.B. Rebelo, Murray J. Corke, Mark A. Holmes, Matthew C. Leach, Fernando Constantino-Casas. Available from: [http://www.appliedanimalbehaviour.com/article/S0168-1591\(16\)00010-1/abstract](http://www.appliedanimalbehaviour.com/article/S0168-1591(16)00010-1/abstract)

Contact Alberta Lamb Producers for more production resources (403-948-8533, info@ablamb.ca, www.ablamb.ca).

How to use the SPFES:

The scale is used to assess five facial areas for abnormal expression (see reverse for pictures and full descriptions);

- eyelids are closed or partially closed
- cheek muscles are tight and/or distended
- ears are rotated back and down
- lips and jaw profile is tightened
- upper lip is curled and nostrils are tightened

Abnormal expressions are assessed to be:

- 'not present' (scored as 0),
- 'partially present' (scored as 1),
- or 'present' (scored as 2).

Each area is scored separately with the total for the five areas combined for a 'total pain score'. The maximum possible score is 10 (i.e. the assessment of each facial area is scored as a '2'). The researchers who developed the SPFES considered a score of 5 or more to warrant the consideration of pain medication use.

Using the SPFES on-farm:

Observing facial expression is one tool that producers and handlers can use to determine the well-being of their animals. In a real life situation, facial expressions should be used in combination with other signs of disease or distress, such as body posture, lameness, increased vocalization, decreased appetite, or obvious injury. As changes in facial expression are likely common to all forms of distress, however, using the SPFES may be particularly useful in cases when more overt signs are absent.

The SPFES can also be used to determine when a treatment is effective in resolving disease or discomfort.

It is important to note that other factors, such as fear and stress, can affect facial expression and care should be taken to assess animals when they are calm.

Talk to your veterinarian if you have questions about the use of pain medication for sheep.

An interactive training tool is available at www.animalwelfarehub.com to help producers and handlers learn more about using the SPFES.

Appendix L: 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.

Table 1. 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

Handling Disease Outbreaks

- Examine affected individuals
- Retain and chill recent dead animals for postmortem
- 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-flock relationship.

The following are examples of medical emergencies for which stockpersons should be prepared (knowledge and supplies): blowfly-strike; rumen overload; hypocalcaemia (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.

Appendix M: Training Materials and Tools for Sheep Locomotion Scoring

The following resources provide training materials, practical tools, and additional guidance to support sheep locomotion scoring and lameness assessment.

Locomotion scoring is a practical method for identifying lame sheep and assessing the prevalence and severity of lameness within a flock. Regular locomotion scoring can help producers identify affected animals early, monitor treatment outcomes, and evaluate flock-level lameness prevalence over time.

There are different locomotion and lameness scoring systems, the link below has further resources and an example locomotion scoring card.

MSD Animal Health – Sheep Locomotion Scoring Scorecard and Resources

<https://www.msd-animal-health-hub.co.uk/OMF/sheep-lameness-month>

Appendix N: 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:

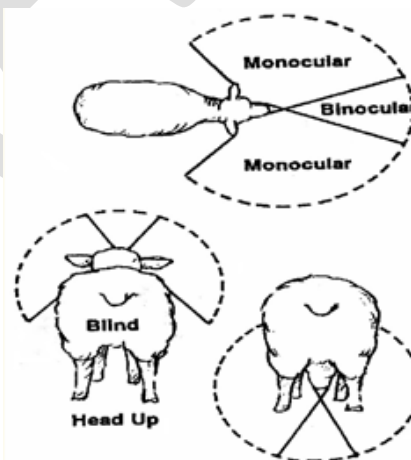
- Sheep like routine, so be patient when introducing something new.
- Sheep reactions are predictable, so use them.
- Sheep react negatively to loud noises and yelling.
- Sheep will bunch up in corners to protect themselves.
- When moving, gathering or sorting sheep, the more efficient the operation 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.



Saskatchewan
Ministry of
Agriculture



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

Canada

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

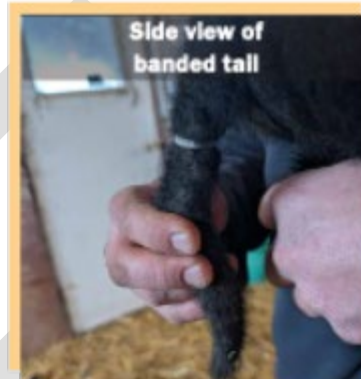
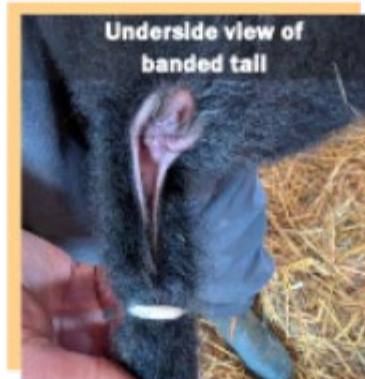
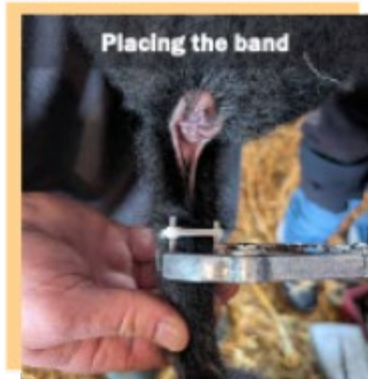
Appendix O: Dock Smart – Cover What Matters



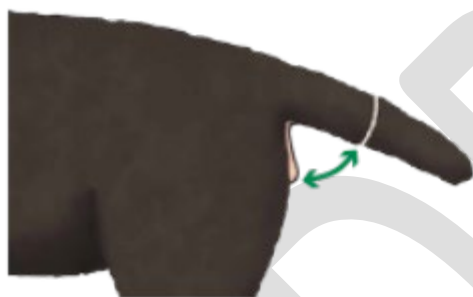
DOCK SMART: COVER WHAT MATTERS

THE REQUIREMENT: When docking tails, tails must cover the vulva in ewes and the equivalent in rams when they are adults.

PROCESS VIEWS



GETTING IT RIGHT



1 Finding the right tail length so the vulva is covered.

2 Confirming the docked tail will cover the vulva.



DESIRED OUTCOMES



UNDOCKED
TAIL



ACCEPTABLE
DOCKED TAIL



SHORT
DOCKED TAIL



VERY SHORT
DOCKED TAIL

Appendix P: Lambing and Neonatal Care

a: Assisting the Ewe at Lambing

©Queen's Printer for Ontario, 1998. Reproduced with permission.

b: Care of the Newborn Lamb

©Queen's Printer for Ontario, 1998. Reproduced with permission.

Note: While this information is still useful to understand, the requirements in the Code supersede any requirements listed in the text of this resource.

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

©Queen's Printer for Ontario, 2013. Reproduced with permission.

a-c continued on following pages:

DRAFT

FACTSHEET

ORDER NO. 98-091

JANUARY 1998

AGDEX 431/23



Ontario

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.

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 mucus, 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 shows any of the below, assistance may be needed. Any delay in assistance could mean the difference between a live and dead lamb.

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
4. if there is an abnormal presentation, a leg back, head back etc.

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**

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.

FACTSHEET



ANIMAL
SCIENCE

ORDER NO. 98-087

JANUARY 1999

AGDEX 431/23



Ontario

Ministry of Agriculture,
Food and Rural Affairs

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

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 lamb's 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, OMLAFR-4, Fergus.

www.ontario.ca/livestock

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: ≤ 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 ≤ 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 ≤ 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 ≤ 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 ≤ 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 ≤ 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.

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.

UNIVERSITY
of GUELPH

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.



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

If temperature $\leq 37^{\circ}\text{C}$

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)

Warming a Hypothermic Lamb Continued

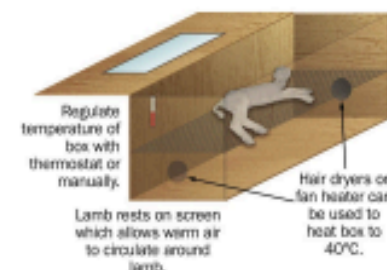
1. A warming box which allows circulation of warm air around the lamb (see diagram below).
2. A water bath warms most quickly but requires holding the lamb to prevent drowning, and immediate drying (towels and hair dryer) to prevent chilling again. This requires the most labour.
3. Heating pad and radiant 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.

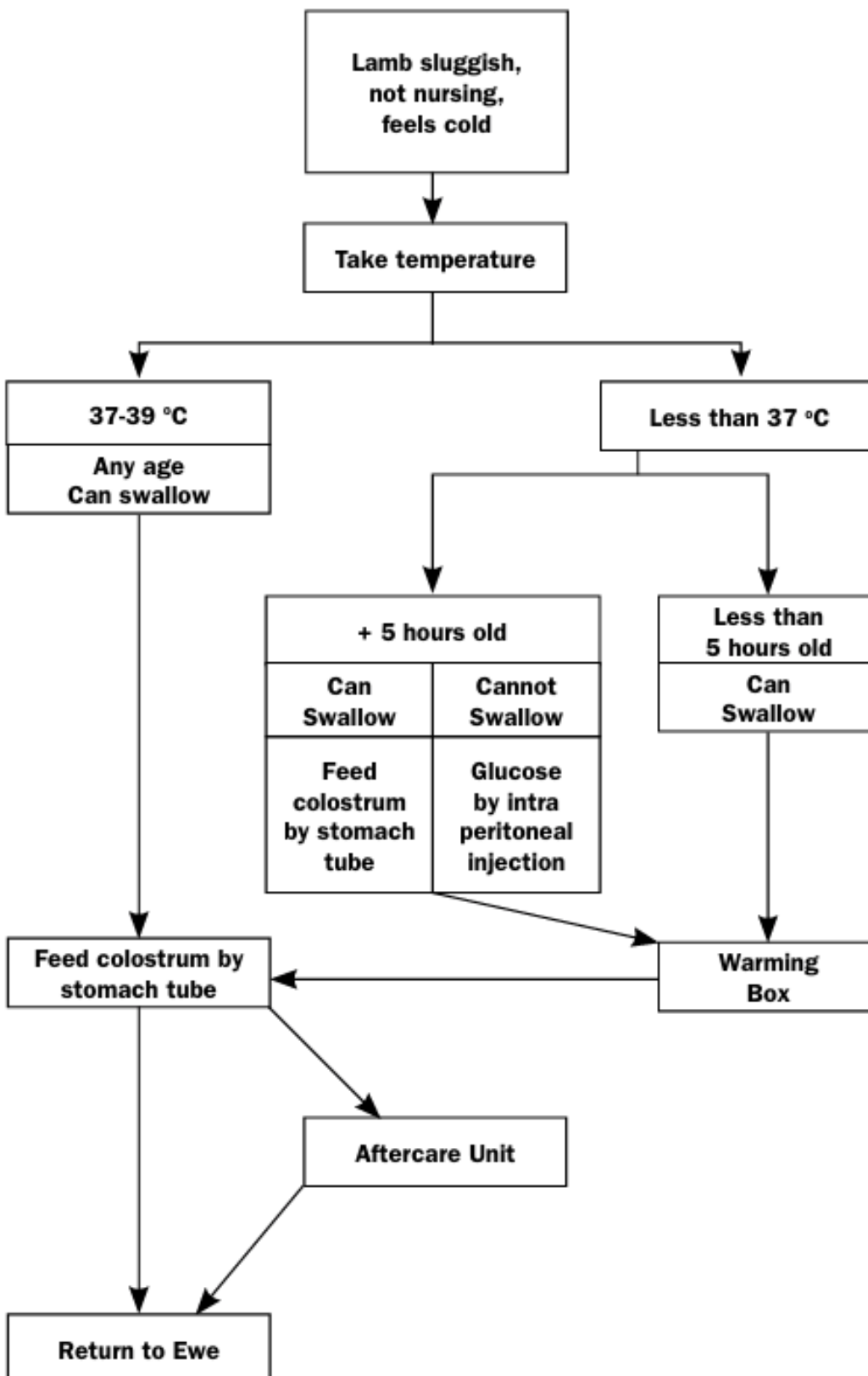
If temperature 37°C to 39°C

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.

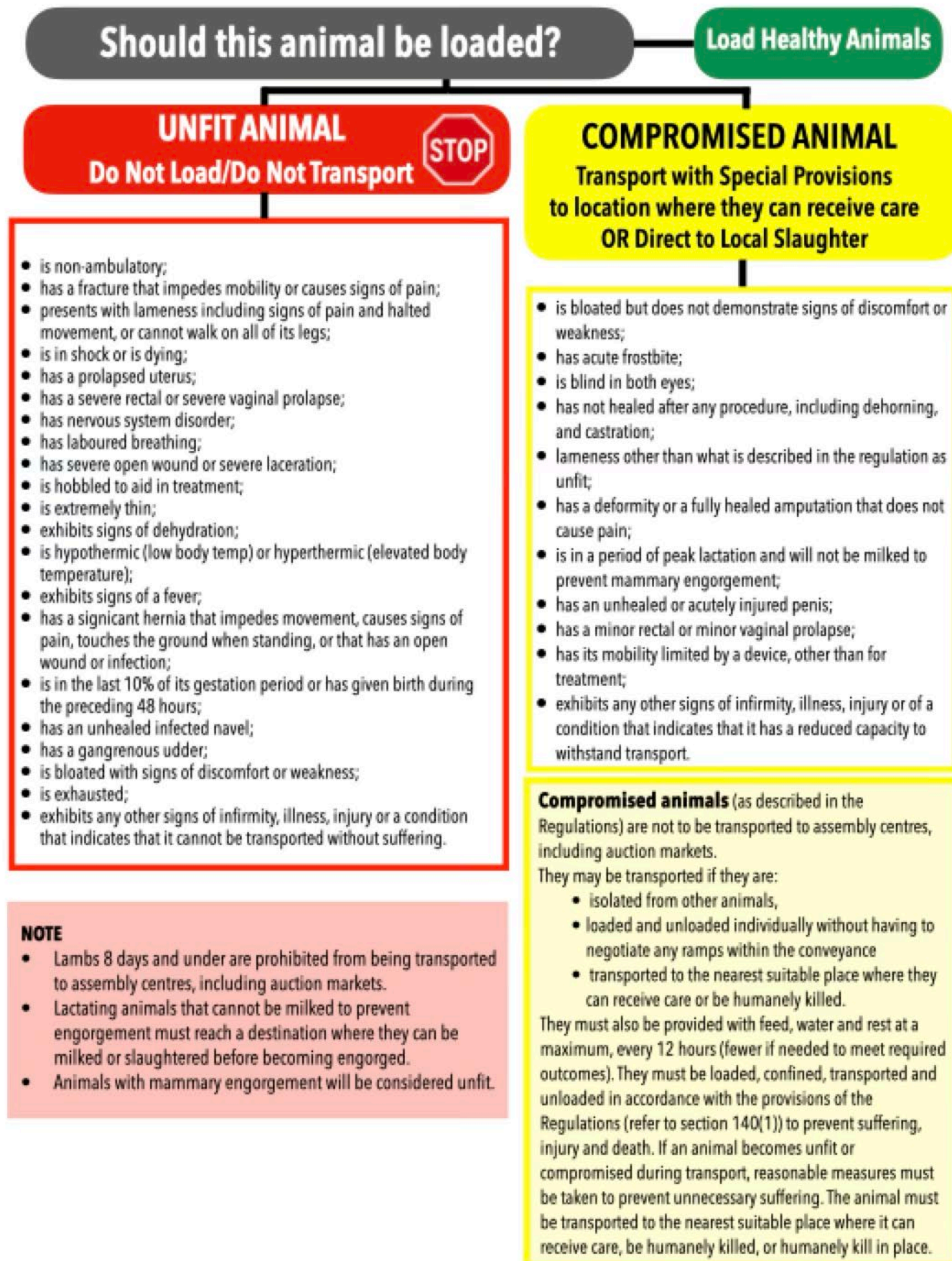
Ministry of Agriculture,
Food and Rural Affairs

 Ontario

Caring for the Hypothermic Lamb



Appendix Q: Guidance for Transporting Sheep



Appendix R: Sample On Farm Euthanasia Plan

Work with the flock veterinarian to develop your Euthanasia Action Plan appropriate for each stage of production on your farm. This plan should be kept in an obvious location in the barn. Review the plan with any new stockpeople, and annually with all stockpeople, family members, and your veterinarian.

Date: _____

Farm name: _____ Prepared by: _____

If anyone on this farm is concerned about an animal's condition, immediately bring it to the attention of a trained and authorized person to approve euthanasia, or contact the flock veterinarian. If the decision to euthanize is made, the procedure must be performed immediately.

Name of person(s) trained and authorized to approve euthanasia: _____

Name of person(s) trained and authorized to perform euthanasia: _____

Flock veterinarian: _____ Phone: _____

Emergency phone: _____

Deadstock collection service: _____ Phone: _____

On-Farm disposal plan, following provincial regulations:

	Primary euthanasia method	Secondary step (if using captive bolt)	Person(s) trained to perform primary method (name & contact #)	Alternate euthanasia method	Person(s) trained to perform alternate method (name & contact #)
Lambs (< 9kg or 5 days of age)					
Lambs (>9 kg or 5 days of age)					
Ewes					
Rams					

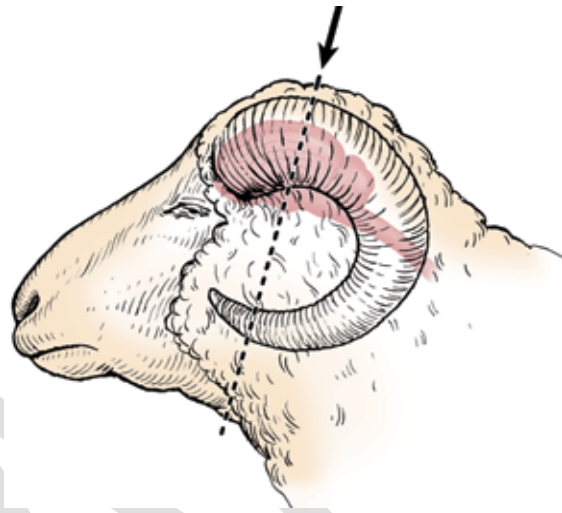
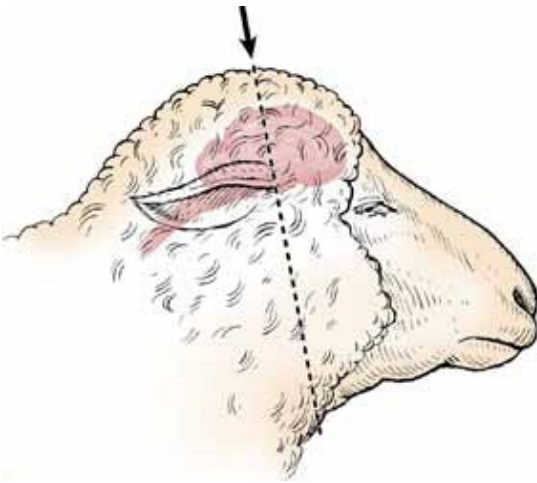
Appendix S: Anatomical Landmarks for Euthanasia

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: <http://vetmed.iastate.edu/HumaneEuthanasia>



Captive bolt positioning on a neonatal lamb.

Source: Photograph reproduced from EFSA Panel on Animal Health and Welfare (2024), *Welfare of sheep and goats during killing for purposes other than slaughter*. Available at: [chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://pmc.ncbi.nlm.nih.gov/articles/PMC11200094/pdf/EFS2-22-e8835.pdf](https://efsa.europa.eu/en/efsa-panels-and-subgroups/panels/panel-on-animal-health-and-welfare/panels-reports/2024/01/welfare-of-sheep-and-goats-during-killing-for-purposes-other-than-slaughter)