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

CODE OF PRACTICE

FOR THE CARE AND HANDLING OF

GOATS

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Preface

The National Farm Animal Care Council (NFACC) Code development process was followed in the development of this Code of Practice. The *Code of Practice for the Care and Handling of Goats* replaces its predecessor developed in 2003 and published by the Canadian Agri-Food Research Council (CARC).

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

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

The NFACC Code development process aims to:

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

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

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

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

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

This Code represents a consensus amongst diverse stakeholder groups. Consensus results in a decision that everyone agrees advances animal welfare but does not necessarily imply unanimous endorsement of

every aspect of the Code. Codes play a central role in Canada's farm animal welfare system as part of a process of continual improvement. As a result, they need to be reviewed and updated regularly. Codes should be reviewed at least every 5 years following publication and updated at least every 10 years.

A key feature of NFACC's Code development process is the Scientific Committee. It is widely accepted that animal welfare codes, guidelines, standards, or legislation should take advantage of the best available research. A Scientific Committee review of priority animal welfare issues for the species being addressed provided valuable information to the Code Development Committee in developing this Code of Practice.

The Scientific Committee report is peer reviewed and publicly available, enhancing the transparency and credibility of the Code.

The Code of Practice for the Care and Handling of Goats: Review of Scientific Research on Priority Issues developed by the Goat Code of Practice Scientific Committee is available on NFACC's website (www.nfacc.ca).

Introduction

While domestic goats are not native to Canada, they have proven to be extremely adaptable to our diverse resources, climate, and geography. In this relatively young and growing sector of agriculture, the central focus of the Canadian goat industry is production of milk, meat, and fibre managed under a variety of housing and grazing systems.

Ontario and Quebec are the main producers of goat products in Canada. Goat milk is mainly made into cheese with a lesser amount being processed into yogurt, ice cream, fluid milk, butterfat, and powdered milk. Goat milk production is a small proportion of total milk production in Canada; however, there has been substantial growth in the number of animals, farms, and total milk produced. In Canada, the number of meat and dairy goats has increased from 230,034 goats reported in the 2016 Census to 253,278 goats on 4,801 Canadian farms in 2021 (20, 21). New Canadians also continue to support their cultural traditions and food preferences which often include goat meat. To meet this demand, the availability of goat meat in larger cities is increasing.

Due to their naturally curious and interactive nature, goats are also commonly featured in agri-tourism and unique small businesses such as pack animals, targeted grazers, exercise companions, petting zoos, and entertainment. They are also commonly kept as companion animals, pets, or in small hobby herds. Regardless of their purpose, the same principles of responsible care and management must be practiced across the industry to safeguard the well-being of goats.

An animal is in a good state of welfare if (as indicated by scientific evidence) it is healthy, comfortable, well nourished, safe, able to express innate behaviour, and if it is not suffering from unpleasant states such as pain, fear, and distress (11).

Codes of Practice strive to promote standards of care that reflect achievable balances between animal welfare and producer capabilities. This Code updates the 2003 goat Code of Practice. It attempts to reflect both modern and traditional management practices while seeking to advance animal welfare as described by NFACC.

Appropriate husbandry, handling, and management are essential for the health and well-being of goats. The care and management provided by the person(s) responsible for daily care has a significant influence on their welfare. Ultimately, it is the responsibility of producers to ensure that all personnel can perform their duties properly. This Code of Practice provides guidance to owners and their families, as well as employees, for the welfare of goats in their care.

The Code identifies welfare hazards, opportunities, and methods to promote well-being. Key knowledge required includes an understanding of the basic needs and behaviour of goats, along with farm protocols and processes. Producers should strive to maintain content, productive, and healthy animals through good management practices by striving to:

- ensure that housing (including natural shelter) and handling systems provide shelter and protection from extreme weather, adequate space and good air quality, allow safe movement of goats, and accommodate natural behaviours
- ensure that goats receive sufficient quantities of feed and water to maintain good health and body condition and to minimize nutrition-related diseases
- improve animal well-being through proactive disease prevention and monitoring herd health, while providing prompt, appropriate treatments
- safeguard goat welfare by minimizing threats from barn fires, power or mechanical failures, extreme weather, and natural disasters

- ensure, through proper preparation, that goats being transported experience the least possible stress without pain and unnecessary suffering and arrive at their destination in good health and condition
- ensure that goats are euthanized or slaughtered promptly and with minimal pain and distress.

This Code does not cover all production and management practices relevant to each sector of goat production. Instead, principles applicable to all sectors of the industry are presented, along with some sector-specific considerations.

The goat Code includes important pre-transport considerations but does not address animal care during transport. Please consult the current *Recommended Code of Practice for the Care and Handling of Farm Animals: Transportation* for information on animal care during transport (22).

Anyone building new or modifying or assuming management of existing goat facilities will need to be familiar with local, provincial, and federal requirements for construction, environmental management, and other areas outside the scope of this document. Individuals requiring further details should refer to local sources of information such as universities, agricultural ministries, and industry resources (refer to *Appendix S – Resources for Further Information*).

The Requirements in the Code may be enforced by various authorities (e.g., welfare agencies or governments) and can be used to legally define accepted standards of care in most provinces and territories. Provincial and federal legislation are also applicable to livestock production (e.g., *Health of Animals Act* and its Regulations).

It is of benefit to the entire Canadian goat industry that the community of goat producers assures goat husbandry is of the highest standard possible.

Glossary

Alternative medicines/therapies: defined as existing separately from and as a replacement for conventional veterinary medicine. The safety and efficacy of these alternative therapies should be demonstrated by scientific methods and evidence-based principles and should be provided within the context of a valid veterinary-client-patient relationship (1).

Analgesia: to control or reduce pain usually through the administration of a local anaesthetic or the use of a systemic medication such as a nonsteroidal anti-inflammatory (NSAID).

Analgesic: a drug that relieves pain.

Anemia: a condition in which the blood is deficient of healthy red blood cells (2).

Artificially-raised: when kids are removed from the dam or orphaned/rejected and fed milk or milk replacer by stockpeople until they are weaned. Also known as "hand-reared."

Assembly centre: for the purposes of Part XII of the *Health of Animals Regulations*, referring to a place where animals are transported for the purposes of assembly (includes auction markets, assembly yards, and holding facilities other than slaughter establishments; 3).

Barbiturate: an injectable anaesthetic and controlled drug that, when given in a high concentration, can be used by a veterinarian to perform euthanasia.

Bedded pack: bedding that consists of a selected bedding material being gradually added and mixed with animal manure (4).

Buck: adult male goat.

Buckling: a young male goat, usually less than 1 year of age.

Canadian Standards Association (CSA): a provider of product testing and certification services for electrical, mechanical, plumbing, gas, and other products (5).

Caprine Arthritis Encephalitis (CAE): a virus that infects goats for life. Infected animals usually do not develop clinical signs of disease until approximately 3 years of age. Signs can include chronic arthritis, bursitis, and reduced milk production.

Caseous Lymphadenitis (CLA, CL): a highly contagious bacterial disease transmitted by contact with contaminated goats, feed, bedding, stockpeople, or equipment. Characterized by abscesses in lymph nodes and sometimes internal organs.

Cashmere: soft downy winter hair usually gathered by combing. May be obtained from Cashmere goats bred specifically for cashmere production or in very small quantities from other breeds of goats.

Claiming pen: a pen where does and their newborn kids are kept to facilitate bonding. Also known as the bonding pen.

Cold stress: when goats are exposed to temperatures below their thermoneutral zone and they expend energy to keep warm. Cold stress can lead to severe hypothermia (rectal temperature < 37° C).

Comb lifter: a plate, fitted to the bottom of a shearing comb, to leave an insulating cover of mohair on the Angora goat when shearing.

Competent person: a person who demonstrates skill and/or knowledge regarding a particular topic, practice, or procedure that has been developed through training, education, experience, and/or mentorship.

Compromised animal: an animal with reduced capacity to withstand the stress of transport due to injury, fatigue, infirmity, poor health, distress, very young or old age, impending birth, peak lactation, or any other cause. Special provisions must be taken for transporting these animals (3).

Conjunctiva: mucous membrane that lines the orbit of the eye and eyelid.

Consciousness: a state of awareness, able to feel pain and/or to respond to touch, sound, and/or sight.

Container: a box or crate designed, constructed, equipped, and maintained for the shipment of animals, suitable for the species (i.e., allows the animal to stand upright with all feet on the ground in preferred position, with full range of head movement, without touching any part of its body to the roof, top, or covering; is well ventilated; and is used in a manner that is not likely to cause injury, suffering, or death). Must also allow the animal to lie down and get up with ease and comfort. Can be moved independently from one mode of transportation to another (3).

Conveyance: any vehicle or container used to move animals or things. For example, conveyance can include aircraft, carriage, motor vehicle, trailer, railway car, vessel, and other means of transportation, including cargo containers (6).

Corneal reflex: involuntary blinking in response to touching the cornea (front of the eyeball).

Crook: a shepherd's staff with one end curved into a blunt hook, used to catch or restrain animals by the neck or leg.

Crutching: the removal of hair or mohair (Angora) from around the tail, flank, udder, perineum, and inner legs of the goat for the purposes of hygiene (e.g., kidding and suckling of newborn kids).

Dam-raised: a kid that is left to suckle on its mother until weaned.

Dehorning: the process of removing horn tissue after the horn bud attaches to the skull (7, 8).

Dewattling: removal of wattles (see "Wattles").

Disbudding: a procedure that removes the horn bud (from which the horn grows) before it attaches to the skull (7, 8).

Disease: a disorder of structure or function of the body, especially one that produces specific signs of illness (e.g., fever, poorer growth) and is not simply a direct result of physical injury.

Doe: adult female goat.

Doeling: a young female goat, usually less than one year of age.

Dried-off: cessation of milking either with or without tapering-off. The udder ceases to produce milk until the doe gives birth again.

Drug Identification Number (DIN): an eight-digit number assigned by Health Canada that identifies a drug product that has been evaluated and approved for sale in Canada (9).

Dysentery: a gastrointestinal infection (usually due to a viral, bacterial, or parasitic infection) that causes abdominal pain and straining diarrhea containing blood or mucus (10).

Electroejaculation: the retrieval of semen by electrical stimulation of the prostate using an electroejaculator device.

Euthanasia: ending the life of an individual animal for humane reasons in a way that minimizes or eliminates pain and distress (11).

Exsanguination: removal of blood from the animal to the point of death.

Extra-Label Drug Use (ELDU): using a drug in any manner not indicated on the label.

Failure of passive transfer of immunity (FPT): when a newborn animal has not received adequate passive immunity (i.e., immunoglobulins) from the colostrum consumed. It may be because the level of immunoglobulins provided was inadequate or that the animal was unable to adequately absorb the immunoglobulins provided.

Fire break: a natural or constructed barrier used to stop or check fires that may occur or to provide a control line from which to work.

Fly strike: a painful condition which occurs when the eggs of blowflies are laid and hatch in a wound or in moist or manure-stained hair, and the maggots burrow and feed on the flesh of the live animal (12).

Foot scald: a bacterial infection between the claws of the foot (i.e., toes). The skin is reddened, swollen, and sensitive to touch, and the goat is lame. Often caused by wet, dirty, or muddy conditions (13).

Foot rot: disease of the foot caused by a bacterial infection (*Dichelobacter nododus*). It can cause painful erosion of tissue between the sole of the toe and outer hoof, resulting in severe lameness. Pus and a foul smell may also be present. It can be spread between goats by contaminated pasture, housing, and foot-trimming equipment (13).

Foremilk: the first stream of milk from the teat.

Free choice (ad libitum): unlimited access. Usually refers to feed and water.

Headstall: a stand that is constructed to hold a goat.

Heat stress: when goats are exposed to temperatures above their thermoneutral zone and must use more energy to maintain normal body temperature. Heat stress can lead to hyperthermia (rectal temperature > 41°C).

Immunoglobulins: antibodies produced by immune cells in the animal's body. Usually in response to infection with viruses, bacteria, or parasites; also produced in response to vaccination. The purpose of the antibodies is to fight the infectious agents.

Isolate: to keep an animal apart from other animals for the purpose of preventing contact. The reasons for isolation are many and include to prevent transmission of disease agents and to prevent injury or suffering.

Joint ill: a bacterial infection of the joints, usually of youngstock. The joints most often affected are the knees (carpus), stifles, and hocks. One or more joints may be involved.

Johne's disease: a fatal bacterial gastrointestinal disease of goats and other ruminants (including cattle, sheep, elk, deer, and bison) that presents as severe weight loss in animals usually > 2 years of age. Also known as paratuberculosis, the bacteria are shed in the manure and sometimes milk for months before the animal appears ill and are very hardy to the environment (14).

Kid: a young goat (usually less than one year of age).

Limit feeding: limiting the amount of feed that is available over a set period of time; the goats may not necessarily eat to satiation (to appetite).

Livestock guardian animal: an animal used to protect livestock from predators. Commonly include certain breeds of dogs, as well as llamas and donkeys.

Loading density: the amount of space given to each animal per unit of space on a conveyance. It should be proportional to the animal's size, its condition, and the weather conditions (temperature and humidity) at the time of transport (3).

Local anesthetic: an anaesthetic drug that induces a loss of feeling or sensation in an area.

Low stress handling: handling goats in a quiet, calm, and controlled manner utilizing their natural herd instincts and behaviours to minimize stress and the risk of injury to the animal(s) and stockpeople.

Marking harness: a harness used with bucks consisting of a coloured crayon on the area of the buck's brisket that marks does that have been mounted.

Mastitis: inflammation of the udder, usually due to an infectious agent. It may be clinical (e.g., the udder is swollen and hot, the milk discoloured) or subclinical (milk appears normal but milk production is decreased).

Medically Important Antimicrobials – Category I: Antimicrobials that are of very high importance in human medicine (e.g., carbapenums and fluroquinolones) and there are limited or no alternatives for these antimicrobials (15).

Medically Important Antimicrobials – Category II: Antimicrobials that are of high importance in human medicine (e.g., macrolides and penicillins) and alternative antimicrobials for these antimicrobials are generally available (15).

Medically Important Antimicrobials – Category III: Antimicrobials that are of medium importance in human medicine (e.g., sulphonamides and tetracyclines) and alternative antimicrobials for these antimicrobials are generally available (15).

Milk vein: a large subcutaneous vein that extends along each side of the lower abdomen of the goat and returns blood from the udder.

Mohair: fibre sheared from the Angora goat.

Moribund: an animal very near death; death is imminent.

Natural shelter: landscape features that form shelters. May include valleys, lee sides of hills, and bush areas. May provide shade, a cool place to lay, or wind protection.

NEMA 4X: a National Electrical Manufacturers Association rating for an outdoor electrical enclosure that incudes:

- protection against liquid and solid ingress
- resistance to corrosion
- protection against damage from ice forming on the outside of the enclosure (16).

Non-ambulatory animal: an animal that is unable or unwilling to stand or move forward without assistance. Non-ambulatory animals may also be called "downers."

Nursery-raised: See "artificially-raised."

Passive immunity: immunization of kids from the passing of immunoglobulins from colostrum consumed. Protection usually lasts 4 to 6 weeks (10).

Pathogen: an agent (e.g., bacteria, virus, parasite) that can infect an animal and cause disease.

Perioperative analgesia: a drug administered before, during, and/or shortly after a procedure to control or reduce pain.

Photoperiod: the period of time each day during which goats receive light of a sufficient strength to mimic daylight.

Pithing: the process of destroying the brain tissue of an unconscious animal to prevent a return to consciousness and to assure death. Pithing is performed by inserting a rod through the hole in the skull created by a penetrating captive bolt device.

Pizzle: another term for penis.

Pizzle rot: infection and inflammation of the foreskin caused by feeding a diet high in soluble proteins or because conditions cause the area to become favourable to bacterial growth (e.g., mohair matting). May lead to fly strike, scarring of the preputial opening, or urine retention. Also known as "infectious balanoposthitis."

Prepubescent: the period preceding puberty (i.e., sexual maturity). Puberty may be reached as young as 3 months of age for a buckling and 5 months of age for a doeling.

Queuing: One or more goats waiting in order to access a resource, such as feed or water that is occupied by another goat.

Ritual slaughter: the practice of slaughtering livestock for meat in the context of a ritual (i.e., for Judaic or Islamic law).

Scurs: a deformed horn resulting from damage to the horn bud; damage may be from injury or poor disbudding technique.

Shorn/Sheared: animals whose hair coat has recently been trimmed or clipped close to the skin, using either special hand or electric clippers designed for this purpose.

Stanchion: a set of adjustable, upright partitions that close around a goat's neck, so that the goat can be temporarily held (e.g., for milking and feeding).

Stillbirth: a kid born dead at term or dying very soon after birth as a result of the birth process.

Strip cup: a special-purpose cup with a dark solid-surfaced or fine-mesh lid. The foremilk is squirted onto the lid to detect abnormalities such as clots, discoloured or watery milk that may indicate mastitis (17).

Stocking density: the number of animals on a particular piece of land at a particular point in time (18).

Stunning: rendering an animal unconscious.

Sub-acute ruminal acidosis (SARA): an abnormally low ruminal pH (i.e., acidic). Occurs when goats have an unbalanced ration consisting of rapidly fermentable carbohydrate source (e.g., grain, pellets). May worsen if the diet contains insufficient effective fibre. Can cause chronic damage to the wall of the rumen and is an important risk factor for laminitis (19).

Tail web: a web of skin on either side of the base of the tail.

Top dress: when grain, mineral, or other supplement is added on top of another feed and offered to the animal without mixing.

Unconsciousness: insensible; unable to feel pain and to respond to touch, sound, and sight. Contrast with "consciousness" (10).

Underwriters Laboratories of Canada (ULC): an independent product safety testing, certification, and inspection organization – www.canada.ul.com.

Unfit animal: an animal that is sick, injured, disabled, or fatigued and that cannot be moved without causing additional suffering. These animals must not be transported unless under the recommendation of a veterinarian for veterinary care (with measures taken to prevent additional suffering; 3).

Urinary calculi: solid particles that form in the bladder when dietary conditions allow. In male goats, these stones may become lodged in the urethra and slow or prevent urination. Also known as "urolithiasis."

Wasting: a serious loss of body weight (10).

Wattles: dangling appendages under the throat or along the neck of goats that serve no apparent purpose but contain blood, nerves, and cartilage.

Weaning: the practice of removing kids from the milk diet provided by the doe or a milk replacement diet (12).

Weaning stress: the stress associated with weaning that may result in slower growth or weight loss. Also known as "weaning shock."

Wether: a castrated male goat.

Wool blindness: when excessive mohair growth near the eyes interferes with normal sight.

1 Roles and Responsibilities

Producers and managers have a primary responsibility for ensuring that goat health and welfare are a priority on the farm. Before stockpeople are assigned their duties, they need to be knowledgeable of the basic needs of, and skilled in caring for, goats in all stages of production. While managers have a primary responsibility for ensuring personnel are trained, all those involved in animal care should be encouraged to identify areas where they would benefit from additional training.

REQUIREMENTS

Personnel working with goats must have ready access to a copy of this Code of Practice, and be familiar with, and comply with, the Requirements as stated in this Code.

Producers must ensure that personnel involved in the care and management of goats are knowledgeable, skilled, trained, competent, and supervised.

RECOMMENDED PRACTICES

a. develop and implement a written Goat Welfare Policy outlining the farm's commitment to responsible and humane animal care (refer to *Appendix A – Sample Goat Welfare Policy*)
b. identify supervisors or managers that personnel can approach with questions or concerns about animal care.

2 Housing and Handling Facilities

Desired Outcome: ensure that housing (including natural shelter) and handling systems provide shelter and protection from extreme weather, adequate space and good air quality, allow safe movement of goats, and accommodate natural behaviours.

Goats may be raised indoors in loose housing, group pens, or with partial/full access to outdoor dry lots, yards, or pastures with night pens or shelters. They may also be raised exclusively outdoors with natural or manufactured shelter. Goats are highly adaptable to the various climates in Canada; however, they do require shelter from wind, rain, and extreme cold weather as well as protection from extreme heat. Goats tend to seek shelter or hide overnight, during adverse weather, when there is a risk of predators, and/or to escape aggressive behaviour (23, 24, 25, 26, 27).

Does kidding in winter or extreme cold and does raising nursing kids need a facility with maternity pens for kidding and early care to promote kid survival.

Natural landscape features are acceptable forms of shelter. Valleys, lee sides of hills, and bush areas can provide shade, a cool place to lay, and some protection from wind. Properly designed windbreaks and hedgerows can also provide additional protection from wind chill. It is critical that an adequate manufactured shelter is available to goats if natural landscape shelter or windbreaks do not provide sufficient protection from extreme weather. Monitoring behaviour, body condition, and goat health will support decision-making to build or use manufactured shelter.

REQUIREMENTS

Goats must have access to shelter.

Goat shelters or buildings, either natural or manufactured, must mitigate the harmful effects of rain, wind, and extreme cold and heat.

Goat housing, including shelters, must keep goats clean and dry.

Building materials with which goats come into contact must not contain harmful compounds.

2.1 Building Environment

2.1.1 Temperature

While goats tolerate hot and cold temperatures, they should be protected from large fluctuations in temperature, drafts, and wind chill.

Clean dry bedding will assist goats in being comfortable in cold weather. Shelter from snow and rain allows goats' coats to remain dry and to provide maximum insulating value. The comfort zone for goats is between 10 and 20°C (50 to 68°F), but this will vary based on factors such as age and coat length. Temperatures over 26°C (80°F), however, seriously reduce feed intake and milk output (28).

Goats need higher energy in their diet to maintain body temperature and body condition during extreme cold. Signs of cold stress include shivering, huddling, grinding teeth, increased feed intake, and seeking shelter if available.

Newborn kids quickly use up their fat stores when born into a cold environment, especially if the kids are wet, and are at risk of starvation and chilling. Along with adequate colostrum, it is important to provide a warm, draft-free area for newborns and very young kids (e.g., supplemental heat, small shelter, or deep bedding) to prevent hypothermia (chilling) and starvation (29).

Goats experiencing heat stress may have increased respiration rates, panting, shallow breathing, reduced lying time, and increased shade seeking. Heat stress also lowers natural immunity, making animals more vulnerable to disease in the following days and weeks (30).

REQUIREMENTS

For the first week of life kids must be protected from wind chills and drafty, cold conditions.

Stockpeople must be able to recognize and promptly assist goats displaying signs of heat or cold stress.

RECOMMENDED PRACTICES

a. maintain kid-rearing areas at temperatures that keep kids in their comfort zones (i.e., no signs of heat or cold stress)
b. check heating systems regularly to ensure that they are safe and in good working order (31)
c. plan breeding to avoid winter kidding if housing and/or management cannot keep kids warm
d. mitigate cold stress using these steps (11):
    - increase the ambient temperature in heated barns
    - provide insulated and/or heated flooring
    - protect goats from wind and moisture (e.g., wind break, three-sided shelters facing south) with the addition of a screen for wind protection
    - provide straw bedding (which offers more insulation than other bedding types) and ensure that the depth permits goats to nest (legs are covered when laying down)
    - adjust the feeding program to meet increased energy demands
    - prevent condensation by assuring adequate ventilation
    - provide goats with clean and dry goat coats or calf coats
e. mitigate heat stress using these steps (11):
    - provide shade through natural or artificial means (e.g., shade cloths, trees)
    - provide ample cool, clean water
    - avoid handling or other stressors especially during the hottest times of the day
    - increase air flow: open vents (i.e., windows, curtains), add more fans to indoor housing.

2.1.2 Ventilation and Air Quality

Proper ventilation is critical to maintaining good air quality and a good barn environment for goats. Pneumonia, hypothermia, and cold stress all contribute to kid mortality and can be minimized with properly ventilated buildings (12).

Air quality is affected by humidity, dust, odours, and the accumulation of gases such as ammonia. Decomposition of feces and urine produces ammonia, hydrogen sulfide, methane gas, and other odours (33).

The ventilation system, whether natural or mechanical, should (21):

- provide adequate fresh air at all times
- distribute fresh air uniformly without causing drafts
- exhaust the respired moisture
- remove odours and gases, such as ammonia (34).

Humidity levels vary depending on weather conditions, stocking density, bedding management, and goat diet. Air circulation that reaches the manure pack reduces buildup of humidity. Excess moisture from wet bedding and expired air will condense on cold surfaces (e.g., ceilings, exterior walls, and steel beams), adversely affect air quality, and settle on the goats, which will lower the ability of the animals to withstand cold stress.

Manure gases can increase the risk of respiratory infections by interfering with the immune system of the lung, in particular its ability to clear pathogens such as viruses and bacteria. Manure gases are heavier than air and so are in higher concentrations closer to the ground, thus putting younger/smaller goats at higher risk of their adverse effects (35).

Ammonia is recognized as an irritant to goats' eyes and respiratory tract and can pose a health threat not only to goats but also to the people that work with them. Sheep (and possibly goats) exposed to ammonia levels of 21 mg/m^3 or higher may reduce feed intake and weight gain (36). A maximum ammonia concentration of 25 ppm corresponds to safety standards established for humans for continuous 8-hour exposure but is not necessarily pleasant for humans or animals (37, 38). The smell of ammonia generally becomes aversive to humans at a concentration of 17 ppm (39). Once aversive, steps should be taken to establish a comfortable environment for goats and personnel (e.g., opening windows or doors).

Providing sufficient fresh air to lower ammonia without causing cold drafts may involve increased monitoring of the environment, installing additional equipment, renovating building(s), and adjusting settings on windows, doors, chimney baffles, curtains, and ventilation fans.

Properly designed ventilation is a critical component to housing design and will contribute to animal, as well as worker, health and safety by assuring good air quality. Improved air quality reduces incidence of respiratory illnesses and promotes better welfare for goats and humans within the barn environment.

REQUIREMENTS

Goat housing must have ventilation (natural or mechanical) to bring in fresh air and exhaust humidity and manure gases.

Condensation visible on surfaces or in the air requires corrective action.

Corrective actions must be taken if ammonia is either detected by smell or if levels are more than 25 ppm.

RECOMMENDED PRACTICES

a. establish a protocol or written standard operating procedure (SOP) for inspecting and maintaining ventilation systems
b. ensure that stockpeople are able to recognize the physical human response to high manure gases levels when entering barns (e.g., odour, irritation of the eyes [tearing], nose, and lungs)
c. remove manure as required to maintain good air quality
d. add more bedding to manure packs to reduce ammonia release
e. measure ammonia levels using an instrument or test kit to determine levels
f. consult an agricultural engineer to help solve ventilation issues
g. adjust ventilation rate and/or lower the stocking density in hot weather
h. eliminate cold drafts at animal level and/or add a safe supplementary heater, if necessary, in cold weather
i. maintain good air quality through sufficient air exchange regardless of weather conditions and outside temperatures
j. use an electrician and/or a professional during ventilation installation to avoid fire hazards.

2.1.3 Lighting

Goats are seasonal breeding animals that are sensitive to photoperiod.

Light is required for proper observation, care of the herd, and goats' activities during the day. Lighting can be controlled or artificially manipulated, depending on breeding management needs. An appropriate period of rest from artificial lighting (e.g., 6 hours) allows goats to maintain their natural photoperiod.

REQUIREMENTS

Goats must have sufficient light to facilitate care and observation.

Artificial lighting must be added to buildings with low natural light.

An appropriate period of rest from artificial lighting (at a minimum, 6 hours) must be provided to allow goats to maintain their natural photoperiod.

All electric wires and fittings must be well out of reach of goats and well protected (29).

RECOMMENDED PRACTICES

a. window area should equal a minimum of 5% (1/20) of ground surface area (22)
b. clean windows to maximize light entry.

2.2 Building Features

2.2.1 Pen Design

Penning should be effective, comfortable, safe, durable, and permit the observation of all animals. Pens should also provide room for rest and exercise. Pen sizes should allow for kidding, treating sick animals, isolation, and husbandry procedures, as well as low-stress movement within a facility. Hospital pens should allow more space per goat for resting, feeding, and drinking.

Pen and alley design should consider common goat behaviours such as:

- goats are naturally playful with a propensity to climb, jump, and escape
- goats are curious. Horns, heads, and feet can get trapped in small openings
- goats like to stand with front feet elevated on horizontal gates, penning, fences, and equipment
- goats want to see where they are going
- goats prefer to be near their herd and are stressed when alone.

REQUIREMENTS

Fences, gates, penning, and feeders must be designed to prevent accidental entrapment.

All penning must be maintained and repaired or replaced as needed.

Barriers, pen dividers, or other penning or handling structures must have no sharp edges or protrusions that might injure goats (32).

Pens must be available to separate and treat goats.

RECOMMENDED PRACTICES

a. consider natural goat behaviours in animal flow designs to minimize stress
b. note repeated injuries or mortalities when handling animals, and determine causes to prevent future injuries
c. locate hospital and maternity pens apart from one another
d. provide safe options for goats to climb, such as raised platforms (40, 41).

2.2.2 Floor Space Allowance in Pens

The amount of space needed per goat varies greatly depending on breed, age, size, presence of horns, feeding, reproductive stage, temperature, environment, production style, and pen management. For example, the space needed for a pregnant doe with horns may double in the last month of gestation as size increases and the doe becomes more irritable, especially in hot weather.

Overcrowding is stressful for goats and can lead to fighting as goats try to establish social dominance. At higher stocking densities, lower-ranking goats will spend less time at feeders and less time laying down resting.

It is important to observe goats for negative behaviours such as:

- clashing and butting
- pushing and displacing
- threatening (or bullying)
- nipping and biting
- dirty hair (from goats climbing over each other to access feed)
- noticeable queuing (lining up) at feeder(s) or waterer(s)
- decreased feed intake, lost body condition (particularly among goats of lower social ranking).

Providing raised platforms in goat housing is an effective way to increase space allowance without increasing the dimensions of a pen, while allowing goats to perform their natural behaviours of climbing and hiding. Multiple levels may also reduce aggressive behaviours between goats (42).

Some minimum space allowance guidelines are reflected in Table 2.1. Less than 1.5 m^2 of space is considered to adversely affect an adult goat's welfare (43). The goal in all cases is to provide every goat with enough space to perform their normal behaviours (e.g., eating, sleeping). It is critical that stockpeople observe goats for overcrowding behaviours (i.e., indicating a need for more space per goat).

Exceeding minimum floor space guidelines will likely decrease fighting and stress and benefit goat health and welfare.

Table 2.1 – Minimum Floor Space per Goat for Different Physiological Stages

Goat Physiological Stage	Pen Space per Goat - Minimum area to provide*	
	m^2/head	ft^2/head
Pre-weaned Kids	0.6	6.5
Weaned Kids (e.g., 8 weeks or older)	0.9	10
Mature Does	1.5	16
Mature Bucks	2.8	30
Nursing Does	1.5/doe + 0.6/kid	16/doe + 6.5/kid
Kidding Pens	2	22
Hospital Pens	2.5	27

*Minimum floor space is dependent on breed, age, size, presence of horns, feeding, reproductive stage, temperature, environment, production style, and pen management. Increase space allowance by 10% when in full fleece, 17% for horned goats, and 25% for pregnant does. Smaller goat breeds may need less space.

Adapted from Canadian Agri-Food Research Council (CARC) (2003) Recommended Code of Practice for the Care and Handling of Farm Animals – Goats. *Available at: www.nfacc.ca/pdfs/codes/goat_code_of_practice.pdf, Department of Agriculture, Fisheries and Food (2010)* Minimum Specification for Goat Housing. *Available at: www.assets.gov.ie/95220/7d55e060-baf8-428b-b5e8-e3a6cfe419f3.pdf, New South Wales Department of Primary Industries (n.d.)* Artificial methods of rearing goats. *Available at: www.dpi.nsw.gov.au/animals-and-livestock/goats/mgt/rearing, and Vas J., Chojnacki R., Kjøren M.F., Lyngwa C. & Andersen I.L. (2013) Social interactions, cortisol and reproductive success of domestic goats (Capra hircus) subjected to different animal densities during pregnancy.* Applied Animal Behaviour Science *147(1–2):117–126.*

REQUIREMENTS

Goats must be housed in groups and have enough space to turn around, lie down, stretch out when lying down, get up, rest, and groom themselves comfortably at all ages and stages of production (44).

If overcrowding behaviours are observed, action must be promptly taken to reduce stocking density.

RECOMMENDED PRACTICES

a. increase space for goats in late gestation
b. increase space for goats in warm weather
c. increase space for goats with horns
d. increase space for goats in pens when bucks are present for active breeding
e. increase space allowances by:
    - extending pen space
    - moving goats
    - reducing group size
    - providing raised platforms.

2.3 Flooring

Goats prefer to walk on hard surfaces. Hard surfaces allow for natural wear of the hoof wall and may help promote hoof health. Goats may choose to lay on hard, dry surfaces like metal, wood, or rubber mattresses while they use areas bedded with shavings and straw for urination and defecation (45, 46). For this reason, providing both a bedded area and a hard, dry surface may be beneficial.

Flooring of bedded pens can be dirt or gravel, wood, rubber, plastic, or concrete. Bedding materials should be safe, non-toxic, and able to absorb moisture. There are typical welfare issues associated with different types of flooring.

Wood and earthen floors, if wet or muddy, create ideal conditions for foot rot and flies. Drainage, diverting rainwater, combined with bedding management can mitigate wetness. Dry lots should be well-drained. Inside earth/gravel floors should be set-up so drainage can occur (e.g., on grade, use of drainage tiles, correct materials).

Concrete floors, if designed to drain well, can be easily cleaned and sanitized. Newborn kids born on bare concrete can slip and are prone to splayed leg injuries. These floors also tend to be cold and damp. Good bedding management can overcome these issues.

Slatted floor nurseries (e.g., renovated pig barns) need to be kept warmer. For optimum kid health, floors need to be clean, with no drafts from below. The primarily milk diet, high urine production, higher temperatures, and lower amounts of bedding all promote the production of ammonia gases. Good hygiene and ventilation are imperative for raising healthy kids on slatted floors.

Refer to *Section 2.8 – Bedding and Manure Management* for more information.

REQUIREMENTS

Flooring must be designed and maintained to minimize slipping and injury (11).

Slatted floors must be maintained to prevent goats from becoming damp, cold, injured, or entrapped; drafts and ammonia levels must be minimized to reduce adverse health effects.

RECOMMENDED PRACTICES

a. choose flooring types that are non-slip but not overly abrasive (47, 48)
b. locate sheds and other structures with earthen floors on well-drained sites or where runoff is diverted away from goat housing.

2.4 Feeder Design

Design feeders and feeding systems so that all goats can easily obtain feed comfortably and at the same time, especially when limit feeding a ration. Feeding space should be adjusted as youngstock grow, pregnancies progress, and for varying sizes across breeds and body types. Large-framed breeds, pregnant goats, and goats with horns may all require more physical space at feeders—up to double the space compared to hornless, dry goats (33).

It is very important to observe goats while feeding, note aggression or overcrowding behaviours, and increase feeding spaces accordingly. This may include installing new feeders, adding portable or temporary feeders or feed stations to pens, moving goats to different pens or pastures, or providing trays, buckets, or meals for individual timid goats.

Decreased feeder space per goat can lead to lower-ranking animals being forced to share feeding spaces or being prevented from feeding as higher-ranking animals take up multiple feeding spaces (49). For lower-ranking goats, this can lead to decreased time spent feeding, less frequent feeding, and more time waiting to feed (50).

Forage fed free choice in bale feeders and racks will need about half the feeder space. When feeding a total mixed ration, grain ration, or when top-dressing a ration, increase bunk space or reduce the number of goats in the pen until all goats can access feed at the same time. It is critical to get higher feed intake in the last trimester of pregnancy. Bucks in breeding pens may disrupt doe feed intake and take up multiple feeding spaces.

Feeding systems that are easy to clean and discourage fecal contamination make it easier and more likely to provide safe, clean, and palatable feed. Goats will have higher feed intake and better health when feeders are kept clean.

Table 2.2 – Minimum Feeder Space per Goat

Type of Goat	Limit Feeding (feeding space width)*	
	cm/goat	inch/goat
Small does: 45 kg (100 lb)	30	12
Average size does: 45–68 kg (100–150 lb) or Angoras in full fleece: 36–45 kg (80–100 lb)	35–45	14–18
Larger does/Meat goats: 68–90 kg (150–200 lb)	40–50	16–20
Horned goats Heavily pregnant & late gestation does	Feeding space per doe should be doubled	
Bucks: 90–135 kg (150–300 lb)	40–60	16–24

*The amount of feed space required is dependent on the size of goat, presence of horns, type of feed, and the feeding methods.

Adapted from Goat Code of Practice Scientific Committee (2020) Code of Practice for the Care and Handling of Goats: Review of Scientific Research on Priority Issues. *Lacombe, AB: National Farm Animal Care Council.*

REQUIREMENTS

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

Feeders must be designed and maintained to prevent goats from becoming injured or accidentally entrapped.

Feeders must be cleaned when contamination (e.g., feces, spoiled feed) is observed in the feeders.

Feeders must be checked daily.

RECOMMENDED PRACTICES

a. allow additional feeder space (up to double) for pregnant does, especially at late stages of gestation
b. monitor the herd and increase feeder space per goat if there is queuing at the feeder
c. using dividers in the feeder will prevent goats from jostling and pushing each other at feeders and reduce aggression
d. using raised feeder designs will allow goats to express their natural instinct to reach up and out to eat (52)
e. elevate mangers 25–30 cm (10–12") above the floor or curb level
f. accommodate the increasing depth of manure pack when setting feeder height
g. design and manage feeders to prevent contamination of feed with manure, urine, or spoiled feed
h. set large bales into bale feeders to avoid crushing/smothering injuries from bale collapse.

2.5 Watering Systems

Goats are very selective about the water they drink. Snow and ice are not suitable sole sources of water for goats. Electrically heated pails and water trough de-icing or heating devices, if not operating correctly, can shock goats as they drink, thus limiting their water consumption. Electrical panels must be checked to ensure that devices are properly grounded.

Waterers may cause a wet environment (e.g., leak or overflow), with more potential for flies, bacteria, and disease. Deep water troughs and 20 L (5 gal) pails of water are a drowning hazard to smaller goats. Waterers should be secured so they cannot be tipped.

Walking far distances to find water consumes energy, which is a greater consideration in very cold and very hot or dry weather. Goats on lush pasture may only drink 1–2 times per day, but on dryer forage, goats will need to drink more often. Refer to *Section 4.7 – Drinking Water*.

REQUIREMENTS

Watering systems must be monitored daily to ensure that safe, clean, and palatable water is always available.

Waterers must be designed and positioned to minimize contamination (e.g., fecal matter, feed).

Waterers must be cleaned whenever contaminated (e.g., algae, organic material).

All electrical watering devices must be properly grounded and maintained to prevent shocks.

Waterers accessible by kids must be sized, positioned, and protected to prevent drowning.

Producers must have a plan to supply water in an emergency (i.e., power failure, drought).

RECOMMENDED PRACTICES

a. encourage water intake using warm water, especially for lactating dairy goats. 15°C (59°F) is ideal (53)
b. use warmer water rather than cold water when goats are experiencing heat stress
c. waterers should be scrubbed weekly, at a minimum
d. test well water and surface water used for drinking at least annually for indictors of water quality (53)
e. access to surface water in pastures should not cause erosion or reduce water quality. It may be against local regulations to allow livestock to access surface water
f. ensure that on pastures, water is within 0.8 km (½ mile) of grazing areas (53)
g. limit depth of water for tanks and troughs used by kids to 20 cm (8"; 53).

2.6 Handling Systems

Goats do not flow through a handling system as smoothly as cattle and sheep and tend to rush toward an actual or expected opening. Goats readily drop to the ground under crowding pressure and are at greater risk from trampling and smothering.

For larger herds and difficult jobs, a good handling system contributes to lowering both animal and human stress. While a handling system is not always feasible or necessary, developing a process for handling will considerably help to manage stress.

Goats should be handled quietly. Goats will startle at sudden, loud, or unfamiliar sounds (e.g., air compressors or metal gates slamming). Excess noise creates agitation.

Longer chutes tend to cause crowding and trampling at the forward end and should be divided into sections with stop gates. An adjustable chute will allow for the handling of small goats and kids through to large bucks and goats with horns. The sides of the chute should be smooth and solid to prevent climbing and to encourage forward movement.

REQUIREMENTS

Handling equipment or method of restraint must not cause injury or unnecessary stress to goats.

RECOMMENDED PRACTICES

a. ensure that handling systems are suitable for goats
b. use a chute with solid sides to contribute to easier movement and prevent entrapment of horned goats
c. walk the route and look for things that may cause distractions or balking before moving goats
d. provide sufficient area and a clear, well-lit path for goats to move in desired directions
e. ensure equipment is designed to minimize noise.

2.7 Enrichment

Goats need to be kept busy, as boredom is a welfare concern. Enrichments that are safe for goats, such as brushes, platforms, opportunities for climbing and hiding, and brush or trees offer amendments to housing and allow goats to perform their natural behaviours.

Providing enrichment can have long-term benefits such as reducing stress and aggression when exposed to changes in routine (such as handling or transport). Providing enrichment may also increase growth rates (54).

Does like to hide their newborn kids, and young kids will hide in small, safe enclosed spaces and corners (55).

REQUIREMENTS

Provide goats with at least one form of enrichment.

RECOMMENDED PRACTICES

a. provide more than one form of enrichment for goats.

2.8 Bedding and Manure Management

Safe and dry bedding added consistently will keep animals comfortable and dry.

All goat housing areas, regardless of system, should be well drained to avoid wet conditions that can create welfare and health challenges (e.g., foot diseases, flies). Bedding provides warmth, insulation, and comfort for goats. In bedded pack systems, it is important to add fresh bedding material as necessary to keep bedding clean and dry, especially during kidding.

Manure and waste present a risk for spread of disease. For example, Johne's disease and coccidiosis are spread through fecal-oral contact. Infectious abortion diseases are shed in birth fluids at kidding time and for up to 2 weeks after kidding. Waste may be an attractant for flies, scavengers, predators, and pests.

As a guide, bedding is too wet if one's knees feel wet after 25 seconds of kneeling in the area. Goats look visibly dirty when bedding is insufficient and/or the pen environment is too wet (56).

REQUIREMENTS

Bedding must be provided in all buildings housing goats (except systems using slatted floors) to create a clean, comfortable, and dry surface.

In cold temperatures, extra bedding must be provided.

Manure and waste must be stored in a manner to:

- ***avoid run-off seeping into goat housing areas***
- ***prevent contamination of water sources and feed***
- ***prevent attracting scavengers to housing areas.***

RECOMMENDED PRACTICES

a. avoid using sawdust bedding
b. do not use spoiled hay in pens for bedding (associated with increased risk of listeriosis)
c. observe the legs of goats over pressure points for signs of abrasions, swelling, or sores indicating inadequate bedding management
d. add clean, dry bedding to maintain a dry, comfortable surface for goats (especially for bedded-pack pens)
e. if bedding is too wet, check reason (e.g., leaky watering devices), and address promptly
f. establish a protocol or written standard operating procedure (SOP) for waste removal.

2.9 Outdoor Facilities – Grazing and Pasturing

2.9.1 Fencing

Secure and robust fencing limits injury or escape. No single fence design is suitable for all landscapes, site conditions, or containment requirements (57).

Goats confined in smaller enclosures are more likely to investigate and damage fencing (58). Goats naturally want to stand on, or climb over, fences, creating sagging gaps and pressing fences outward. Horned goats can easily become entrapped in page wire fencing. It is very important to monitor fences every day and to release entrapped goats promptly.

Escaped goats usually do not stray far from their herds, although they become more vulnerable to predators

Table 2.3 – Types of Fencing for Goats

Type of Fencing	Ideal Dimensions	Advantages	Disadvantages/ Challenges
Ideal: Woven or Field fence **combined** with electric fence Board fence **combined** with electric fence	Strand of electric wire placed on inside of fence at nose height; and to prevent jumping (e.g., 1 or 2 strands 25cm [10"] above top of fence).	Offers more security than either fencing method on its own. Can safely utilize existing page wire fencing of most gauges. Electric wire prevents rubbing, damage to fence, and animals from becoming trapped or injured.	Goats can ingest toxins from treated wood or lead-based paint in board fence. Same challenges as electric fence below.
Woven fence Page wire Field Fence	Ideal fence gauge varies with goat size and horn status. Adapt management and monitoring to existing fence.	Good for disbudded goats. Sheep fence has extra horizontal wires in lower 8–12" to prevent escapes.	Horned goats may get their head stuck in openings near posts, or in sagging and enlarged openings.
Electric fence	Live wires should be minimum of 6–8" apart, including a horizontal wire placed ~ 6" from the ground to prevent goats from slipping through fence—may need up to 7 strands.	Higher voltage (4000–5000 volts) using a pulsing current will not damage a goat or predator but will leaves a lasting impression.	Long hair or fibre insulates the goat from feeling the charge. The fence needs to be checked daily for charge and to detect items that may be grounding the fence (e.g., weeds, fallen rails). Requires a source of electricity the entire time goats are in the pasture. **Need to train goats to electric charge.**
Temporary electric netting	1.1m (4 ft) height	Quick and easy way to set up temporary paddocks or fence off areas for a short term.	See electric fence above. Horned goats can get snagged or entangled in netting. **Need to train goats and monitor as with electric fencing.**
Stock fencing or hog panels (vertical steel rods welded)	1.1m (4ft) height is usually adequate. To contain bucks—ideal height is ≥1.5m (5–6ft).	Goats are unlikely to get feet caught when standing on fence.	Welds can break when goats push/butt heads. **Need to repair gaps and protruding rods.**
Chain-link fencing	3–4" openings.	Small weave is most secure.	Small feet can get stuck.

Table 2.3 – Types of Fencing for Goats (continued)

Use with Caution	Disadvantages
Page wire fence for cattle (e.g., 8" x 12" holes) with no secondary electric fencing.	Horned goats get heads stuck. Young kids can escape through bottom.
Picket fence Skids or pallets used as fencing	Broken legs, strangling.
Barbed wire	Entangled goats become injured and highly stressed. Thin skin of goats can tear easily, causing severe damage including lacerated skin and udders.

Sources: Belanger J. & Bredesen S.T. (2018) Storey's Guide to Raising Dairy Goats, 5th Edition: Breed Selection, Feeding, Fencing, Health Care, Dairying, Marketing. Storey Publishing. *Ontario Goat (2014) Best Management Practices for Commercial Goat Production. Guelph ON: Ontario Goat.*

REQUIREMENTS

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

Fencing must be monitored daily for entrapped goats and corrective action taken as needed.

If entrapment or injury is a recurring problem, stockpeople must investigate and repair.

RECOMMENDED PRACTICES

a. inspect all fences at least monthly (and repair if necessary). Additional inspections may be necessary immediately after a wind storm, snow blizzard, heavy blowing snow, or after escaped animals have returned (57). Additional inspections may be necessary for electric fencing
b. check fences to ensure that they are firm and upright and that tension is being maintained (53)
c. ensure that fencing is low to the ground to prevent animals from escaping, but tall enough to prevent predators from entering or goats from jumping out
d. test electric fences for proper voltage and grounding and clear scrub and weeds from around the electrified strands (53)
e. ensure that all perimeter gates have secure mechanisms to prevent accidental opening (e.g., latches, hooks, chains).

2.10 Milking Parlours

Most dairy goats are milked in a parlour although in smaller operations goats may be milked in a headstall. The parlour needs to be well designed so that the animals are not stressed or injured at milking time and move easily in and out. Good parlour design will also aid in complete, fast, and stress-free milk out (59). Most design layouts have 2 components: the milking parlour and the holding area.

The holding area is next to the parlour and holds groups so that milking can be done with a continual flow. A good design will make it easy for the animals to see where they are going (i.e., the parlour). No slope, or a steady low slope, will reduce stress when goats enter and leave the parlour. A space allowance of 0.325 m^2 (3.5 ft^2) is used as the goats are crowded only for a short time. A safe backing gate can be used to bring in the latecomers.

The milking parlour, which may vary widely in design, needs to be safe and not stressful for the animal. The floor should be smooth enough to be easy to clean, but with enough gripping surface so as not to be slippery. The headlock (if used), panels separating the goats during milking, and milking units should be adjusted so as not to injure any animals. Feeding in the parlour is optional and contributes to keeping

the goat occupied, although may not be ideal for nutritional health. It is important to keep these working areas well illuminated (60).

Parlours should be easy to maintain and keep clean to safeguard animal health (by reducing potential for udder infections). Traffic through a parlour will inevitably cause a build-up of manure, urine, spilled milk, teat dip, and feed. It is critical for udder health that the parlour be set up for routine cleaning and sanitizing. It will also prevent a build-up of flies which cause mastitis and other diseases (55). Refer to *Section 5.10.2 – Milking Procedures.*

REQUIREMENTS

Parlour areas must be free of protrusions or sharp edges that could injure goats.

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

Gates and restraining devices of milking stalls must operate smoothly and safely.

RECOMMENDED PRACTICES

a. ensure that milking parlours and holding areas are free of steep slopes (i.e., no more than 35°; 3)
b. ensure that floors provide good traction to prevent slipping, even when wet
c. ensure that parlour areas are well illuminated and ventilated
d. goats should not be held in holding areas longer than 30 minutes
e. use fans or other technology to moderate temperature extremes and eliminate condensation in milking parlours and holding areas.

3 Emergency Preparedness and Management

Desired Outcome: To safeguard goat welfare by minimizing threats from barn fires, power or mechanical failures, extreme weather, and natural disasters.

3.1 Emergency Prevention and Preparedness

Emergencies may arise and compromise goat welfare due to power failures, barn fires, wildfires, flooding, disruption of supplies, etc.

Emergencies are, by their nature, atypical and undesirable. They interrupt normal routines and can be quite devastating. It is normal, therefore, to avoid thinking about them, let alone planning for such. Advanced meaningful planning may help to prevent bad situations from becoming much worse.

Pre-planning (e.g., predicting, planning, and preventing) may enable producers to prevent emergencies and to respond in a timely and effective manner, thus providing for the welfare of goats during emergencies. Once methods to prevent emergency situations have been put in place and preparation for different types of emergencies has been completed, action plans must be established in case emergencies arise.

Emergency planning begins with the recognition that emergencies create stress, and that stress makes it harder to think clearly and act rationally. For this reason, effective emergency planning should strive to be as clear and as actionable as possible. While no two farm plans will be identical, there are common elements or steps that should be addressed (e.g., refer to *Appendix B – Emergency Telephone List* and *Appendix C – Mapping Barns and Surrounding Areas for Fire Services*). For most, if not all emergencies, the steps to be followed in terms of planning and responding are similar.

Do not assume that everyone knows what to do in the case of emergencies—this may not be the case. Make sure that everyone around the farm, including family members, knows what to do and that they have practiced different emergency plans—at least once. Practicing emergency scenarios is important to ensure that people respond calmly and automatically in possibly panic-inducing situations.

REQUIREMENTS

***An emergency telephone list must be readily available for the producer, stockpeople, and emergency crews. Refer to* Appendix B – Emergency Telephone List.**

Farm-specific procedures must be prepared for emergencies such as fires, equipment or power failures, and extreme weather events. The procedures must be written and communicated to stockpeople and family members.

***A map of the barn and its surroundings must be drawn and kept readily accessible for emergency crews. Refer to* Appendix C – Mapping Barns and Surrounding Areas for Fire Services.**

Emergency plans must include specific actions and those designated to conduct specific actions.

Plans must be easily accessible at the onset of an emergency.

Plans must ensure that the welfare of the animals is maintained in any potential emergency event.

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)
c. decide how and where animals will be relocated if necessary. Refer to S*ection 3.1.4 – Deciding to Evacuate or to Shelter in Place*).

3.1.1 Fire in Farm Buildings

Fires in farm buildings are devastating events. The loss of animals, buildings, and equipment can be overwhelming. Approximately 40% of all barn fires are caused by faulty electrical systems, making it one of the leading causes of barn fires (62). Regular inspections and maintenance are key to reducing the risk of barn fires.

REQUIREMENTS

All electrical connections to equipment must be hard-wired. Extension cords must only be used temporarily and unplugged when not in use.

All electric wiring, outlets, and fixtures (e.g., heat lamps) must be out of reach of livestock.

Fire extinguishers must be available and maintained according to manufacturer's instructions. Stockpeople must know where they are located and must be competent in their use.

When in use, heat lamps and infra-red heaters must be kept at a safe distance from combustible materials, including bedding.

Heat lamps must have a guard and must be suspended using non-combustible materials (62).

RECOMMENDED PRACTICES

a. ensure that a fire safety self-assessment is completed annually. Refer to *Appendix D – Assessing Farm Buildings for Fire Prevention*
b. consult local fire services for specific advice on fire prevention, including the correct number of and best location for fire extinguishers
c. inspect and maintain electrical systems on a regular basis
d. smoking, using torches, or other ignition sources (e.g., devices for disbudding kids), should not be allowed near any flammable materials
e. refuel engines outside of barns, and only once they have been turned off and cooled down
f. vent and provide a fresh air supply where grain handling and feed preparation activities generate dust
g. properly protect electrical fixtures using conduit fittings and NEMA 4X
h. use of totally enclosed fan-cooled motors is recommended
i. remove combustible materials from around electrical systems and farm buildings to prevent build-up
j. store flammable compounds in separate areas/buildings that are suitable for combustible materials and away from animal housing
k. harvest and store hay properly to lower risk of spontaneous combustion
l. store only a small amount of hay near animal housing
m. only heat lamps or infra-red heaters with the CSA or ULC labels should be used.

3.1.2 Wildfires

A wildfire involves the uncontrolled burning of grasslands, brush, or woodlands. Wildfires destroy property and valuable natural resources and may threaten the lives of people and animals.

Wildfires can occur at any time of year, but usually occur during dry, hot weather. Check federal and provincial government websites for wildfire probability forecasts (e.g., Environment Canada). Local radio and television stations also broadcast information and warnings on local fire conditions.

Wildfires are normally recognized by dense smoke, which may fill the air over a large area. When a wildfire occurs, the decision to shelter in place, evacuate animals, and/or evacuate people must be continually considered as the situation evolves. Refer to *Section 3.1.4 – Deciding to Evacuate or to Shelter in Place*.

There are several actions that can be taken to prevent or reduce wildfires. The first is to reduce the risk of starting a fire in your own backyard. Refer to *Section 3.1.1 – Fire in Farm Buildings*, for guidance.

RECOMMENDED PRACTICES

a. use only fire-resistant materials on the exterior of your barn or home, including the roof, siding, decking, and trim
b. consider installing fire suppression systems for buildings as well as an outdoor system
c. when constructing pools and ponds, make them accessible to fire equipment—they may serve as a source of water for fighting wildfires
d. ensure that dedicated hoses are long enough to reach all parts of your building
e. maintain a fire break around the perimeter of the property, pastures, or buildings
f. controlled burns should not be conducted near livestock buildings. Local fire departments should be consulted for advice on controlled burns.

3.1.3 Power/Mechanical Failure

Power and mechanical failures may trigger on-farm emergencies capable of endangering animals and their caretakers. These failures have a greater impact on goats that are reliant on power and mechanics to provide feed, water, ventilation, and milking.

REQUIREMENTS

If the systems cannot be run manually, an alternative method or power source must be available to run critical systems (e.g., watering system, ventilation, milking, feeding).

Producers must have enough feed and safe, clean, and palatable water to meet the needs of their goats for at least 72 hours.

All electrical and mechanical equipment and services including water bowls and troughs, ventilating fans, heating and lighting units, milking machines, and alarm systems must be inspected at least annually and kept in good working order.

RECOMMENDED PRACTICES

a. calculate the amount of water that your goats need daily. A reliable backup source of water of acceptable quality should be identified. This can be a well if a generator is available to operate a pump
b. estimate the electrical needs of your farm to ensure production and management continuance
c. a generator (fuel or tractor powered) should be available for emergency use
d. keep fuel reserves sufficient to run the generator for 72 hours on-site
e. alarms and fail-safe devices, including an on-farm alternate power supply, should be tested according to manufacturer's recommendations to ensure that they are in working order
f. a standard operating procedure for maintenance of all equipment and services on-farm should be developed and available for stockpeople
g. determine the minimum daily feed ration for the goats' level of production. Consult with your nutritionist or supplier to establish these minimums
h. keep extra maintenance supplies and parts on hand in case of longer delivery times due to adverse weather conditions or road closures in your area.

3.1.4 Deciding to Evacuate or to Shelter in Place

In times of extreme environmental conditions, and if thorough preparations are in place (including a good emergency plan that can be implemented if or when needed), staying on-farm may be conceivable. However, in emergency situations involving flooding or wildfires, the evacuation of animals and/or humans may be necessary. To help prepare for proper evacuation planning of animals and family, consider the following:

- contact local emergency management authorities to become familiar with at least 2 possible evacuation routes
- arrange for a place to shelter animals (e.g., fairgrounds, other farms, racetracks, exhibition centres). Accommodations will need to include milking equipment for dairy goats (as applicable)
- consider the health status of the herd and whether they will come into contact with other herds during evacuation
- ensure that enough feed, water, and medical supplies are available at the destination
- consider how animals and people will be safely transported
- make sure animals have enough identification (e.g., ear tags or leg bands) to be able to tell them apart from others
- make sure to have adequate and safe fencing or pens to separate and group animals appropriately
- prepare an emergency kit that will follow the animals (refer to *Appendix E – To Prepare in Case of Evacuation*).

There may be circumstances where the risk to life is great and there is not enough time to evacuate animals (e.g., having a wildfire start in the immediate area). In this situation:

- protection of human life and safety should be the priority
- after ensuring human safety and if it is safe to do so and time permits:
    - open gates between pens and pastures to give the animals more room to escape the hazard. Do not to let animals out into unfenced areas as they could become hazards on roads or for emergency rescue teams
    - put extra feed and water out where the animals can get to it, as it may be a few days before caretakers are allowed to return home
    - consider turning off power, propane, and natural gas to reduce the chance of these utilities causing additional problems.

If a decision is made to remain on the property during an emergency, decide whether to confine animals in an available shelter or leave them outdoors. A safe pasture has:

- no overhead power lines or poles
- no debris or sources of blowing debris
- adequate and safe fences that will contain the animals
- enough open space to allow animals to avoid blowing debris
- access to at least 3 days of food and clean water.

RECOMMENDED PRACTICES

a. consider likely emergencies your farm may experience and whether you would evacuate or shelter in place. Create a written evacuation and/or shelter in place plan(s)
b. when advance notice of an emergency is available, evacuation plans should be applied at least 72 hours before anticipated landfall to avoid being caught in high winds, flooded roads, or heavy traffic.

3.1.5 Catastrophic Animal Losses

Even if well prepared, emergency circumstances can bring about situations where animal health and welfare may be compromised to a point that euthanasia must be considered. In some situations, entire groups of animals may have died or must be euthanized (e.g., following a barn fire or other natural disaster, or as a result of disease outbreak) and in both cases carcasses will need to be removed and suitably disposed.

In some cases, government representatives may be involved in the decision-making and euthanasia processes. Euthanizing goats must always employ humane techniques (refer to *Section 8 – Euthanasia and On-farm Slaughter*).

A plan for euthanizing an entire herd should provide guidance in the event of a disease outbreak or other unexpected disaster (refer to current provincial and federal regulations). Plans will need to be reviewed regularly and updated as needed.

Plans should include:

- euthanasia method(s)
- biosecurity considerations
- identification of appropriately trained individuals to oversee and participate in the process
- reporting procedures (to designated authorities)
- safety procedures for personnel
- carcass disposal.

Those involved in euthanizing large numbers of goats, particularly when they are ill but may still appear healthy, can suffer emotional stress. Moreover, individuals may encounter physical fatigue. Both types of stress can have a negative impact on goat welfare during the euthanasia event.

REQUIREMENTS

All farms where euthanasia is performed by anyone other than the owner/primary producer must have a written Euthanasia Action Plan that indicates appropriate methods, landmarks, and secondary steps when using a captive bolt.

RECOMMENDED PRACTICES

a. develop a plan in advance for the appropriate disposal of carcasses (refer to current provincial and federal regulations) in the case of animal losses or mass euthanasia.

4 Feed and Water

Desired Outcome: For goats to receive a diet of sufficient quality and quantity to maintain good health.

4.1 Feed

4.1.1 Managing Feeding and Nutrition

Providing good nutrition prevents disease and enhances welfare. Goats receiving inadequate diets are more prone to disease and will fail to reach their genetic potential.

Diets must take into consideration:

- environmental conditions/weather
- type of production system, level, and stage of production
- level of activity, age, size, species, and sex (buck vs. doe)
- body condition
- feed and water quality and availability.

Goats are browsers. The normal feeding behaviour of goats involves continual picking and choosing of forages. Managing feed and feeding to allow goats to select and sort their ration means that the diet consumed may be different from what is intended.

Qualified small ruminant nutritionists and agronomists can provide specific information on forage cropping, appropriate types of feed ingredients, feed sample results, and correct balancing of rations (63).

REQUIREMENTS

Feed (including forage, pasture, and/or grain ration) must be accessible and available every day.

Feed provided must meet nutritional needs of goats appropriate for species, age, size, and stage and level of production.

Sufficient fibre must be provided in the ration to promote rumination (cud chewing).

Ration changes must be made gradually to allow acclimation of the rumen microflora.

RECOMMENDED PRACTICES

a. producers and stockpeople should be familiar with the nutritional requirements of their goats
b. work with a qualified nutritionist to formulate rations to meet dietary needs
c. formulate mineral mixes specifically for dietary needs of goats (32)
d. analyze forages for nutrient content before feeding to allow for correct balancing of the diet
e. encourage producers and stockpeople to become familiar with potential micronutrient deficiencies or excesses in their geographic area and formulate rations accordingly (32)
f. keep up-to-date feed and ration ingredient lists or tags of formulations, including mineral/vitamin mixes, to verify balanced diet
g. provide quantities at each feeding that will be fully used and push up feed in bunks/alleys to ensure it can be easily accessed to prevent feed from becoming rancid (53)
h. remove rejected, soiled, or spoiled feed from feed alley or trough before adding more feed (53)
i. support optimal rumen performance by consistently and routinely providing only the amount of feed required for 1 day (53), and provide fresh feed every day.

4.1.2 Managing Feeding and Body Condition

On-farm husbandry and management directly influence body condition. Body condition scoring (BCS) evaluates the amount of muscle and fat over the ribs, spine, and sternum. It is a tool widely used by livestock producers as an aid to herd management and can also be a key tool for on-farm assessment and management of goat welfare (64).

Both emaciation (a BCS of less than 2 out of 5) and obesity (a BCS of greater than 4 out of 5) can compromise the health and welfare of the individual goat and the herd. Doe condition has a major effect on colostrum quality and kid development and survival. Obesity is a particular welfare concern for pregnant does, which may experience reduced appetites and be at risk for developing pregnancy toxaemia. Emaciation may result from inadequate feed intake, chronic disease, or dental problems (32). Does that are too thin will have low milk production and reproductive issues in the next lactation (32). When BCS changes, it is critical to make corrections to diet and feeding management before goat health declines.

Target body condition scores will vary depending upon stage of production.

Table 4.1 – Acceptable Body Condition Scores (BCS) for Production Stages

Body Condition Scoring (out of 5)	Nutritional Demand	Target BCS	Acceptable Range
For most stages of production	Low to moderate	3.0	2.5–4.0
Does at kidding, or before winter	High	3.5	3.0–3.5
Does at peak lactation	Very high	2.5–3.0	2.0–3.5
Does at breeding	High	3.0	2.5–3.5
Bucks at breeding	High	3.5	3.0–4.0

Adapted from Ontario Goat's Body Condition Score, Appendix F – Body Condition Scoring, *and OMAFRA. 2021*. Body Condition Scoring Dairy Goats. *Available at:* www.omafra.gov.on.ca/english/livestock/goat/news/dgg1708a5.htm.

Lactation places a very high nutritional demand on the doe regardless of production type and so the diet must be formulated to meet this need. Dietary requirements at peak lactation often exceed what the doe can safely consume daily. Shortages of energy in the diets of lactating does translates quickly to reduction in milk production (a concern for nursing meat and fibre does). High producing dairy goats can lose weight (up to 7 kg) during the first months of lactation as they mobilize body reserves to produce milk. They eventually need to regain this weight (33). Lactating doe BCS must not drop below 2.

REQUIREMENTS

Body condition must be routinely monitored.

Corrective action must be taken if body condition score falls below 2 or above 4 (out of 5).

RECOMMENDED PRACTICES

a. ensure that the technique of Body Condition Scoring is learned and used to assess whether the diet of the herd is maintaining goats in an acceptable range of body condition appropriate to their stage of production (*Appendix F – Body Condition Scoring*)
b. incorporate BCS scores into the livestock record keeping system
c. if the body condition of a group or herd drops, consult a nutritionist and/or veterinarian to investigate and take corrective action
d. note the body condition of goats that hang back from a group at feeding time, queue to feed after the main group, or experience persistent bullying from other goats
e. take corrective action if goats are being deprived of feed (goats could be fed separately, moved to different or smaller groups/pens where they can compete, or be removed from the herd).

4.1.3 Managing Feed Quality

Feed must be carefully monitored so that any spoiled feed or forage can be removed and not fed to goats. Spoiled feed can have lower palatability as well as reduced nutrient content due to contamination, incorrect fermentation, or wet storage conditions. Preventing goats from eating spoiled feed is easier than treating diseases caused by poor feed quality. Not all spoilage or contamination is visible or commonly tested for. Spoilage is accelerated in warmer weather.

Hay and forage containing particles of soil increases the risk for bacteria such as *Clostridium tetani* and *Listeria monocytogenes*. Listeriosis and clostridial diseases are often fatal without early identification and intervention. Hay contaminated with cat feces or dead rodents increases the risk for toxoplasmosis.

REQUIREMENTS

Feed must be handled, stored, and fed to maintain quality and minimize spoilage.

Feed contaminated with visible mold, spoilage, soil, or fecal material must not be fed to goats.

Stockpeople must be able to recognize signs of disease that could be related to poor feed quality.

Reasonable steps must be taken to prevent exposure to toxins (e.g., poisonous plants, moldy or spoiled feed, toxic construction materials, antifreeze, lead, and pesticides).

RECOMMENDED PRACTICES

a. monitor and observe goats for signs of feed refusal or illness. Investigate promptly
b. store feed in a dry area to avoid mold formation and spoilage (53)
c. when handling haylage/silage, take care to disturb as little as possible. Any air that enters may decrease feed value and palatability (53)
d. when feeding haylage/silage in warmer weather, feed smaller amounts more frequently to reduce spoilage and feed refusal (53)
e. cover all feed hoppers, bins, carts, and storage containers to minimize contamination by feces from birds and other animals
f. protect hay and straw from access by cats, rodents, and raccoons. Unprotected top bales are more likely to be contaminated with urine and feces and should not be fed to pregnant does
g. regularly inspect all feedstuffs for mold or spoilage (53)
h. spoiled or contaminated feed should be disposed or composted away from feed storage and production areas.

4.2 Newborn Kids and Colostrum

Kid illness and mortality are welfare concerns. Proper colostrum management is crucial for the prevention of kid mortality and supporting optimal health (Table 4.2; 41).

Table 4.2 – Colostrum Guidelines

Quantity	Kids need to receive 20% of their bodyweight of good quality colostrum in the first 24 hours of life, divided into at least 3 feedings.
Quality	Colostrum quality refers to the amount of energy (fat and protein) and immunoglobulins. A reliable on-farm method of measuring quality is to use the Brix refractometer; measurement of 19–21% or higher indicates good quality.
Quickness	Provide the first colostrum feeding as soon as possible – within the first 2 hours is best. The ability of a kid to absorb the antibodies from colostrum begins to fall immediately after birth. Immunity is only gained in the critical period within 24 hours after birth (65, 66).

Good quality colostrum can be frozen for future use. Commercial goat colostrum replacement products are typically of bovine origin, which supplies the necessary energy but may impact the effectiveness in building antibodies specific to goats. Fresh or frozen or heat-treated goat or bovine colostrum and freeze-dried bovine or goat colostrum powder are all acceptable sources of colostrum. Improper or overheating of fresh or frozen colostrum can degrade antibodies and reduce passive transfer of immunity.

Bottle feeding colostrum allows kids to learn to suckle. Suckling triggers the esophageal groove reflex, which is the most efficient way for antibodies to reach the gut wall. Tube feeding allows the most control over amount, quality, and timing of feedings.

Additional information about colostrum management is provided in *Appendix S – Resources for Further Information.*

4.2.1 Colostrum Management for Dam-Raised Kids

Practices including doe vaccination programs, maintaining acceptable BCS, udder health, and dry goat management all contribute to good quantity and quality of colostrum. Vigour and fullness in the kid's gut needs to be carefully assessed in the first hours of life to identify kids that need additional energy and immunoglobulins from supplemented colostrum.

Triplets, quadruplets, and small or weak kids are at greater risk of insufficient intake (68). Lost, mis-mothered, orphaned, and rejected kids are also at risk.

When supplementing colostrum, follow the procedures for artificially-raised kids outlined below (refer to *Section 4.2.2 – Colostrum Management for Artificially-Raised Kids*).

REQUIREMENTS

Newborn kids must receive their first colostrum feeding as soon as possible (within the first 2 hours is best) and no later than 6 hours after birth.

A supply of good quality colostrum or colostrum replacer must be available to supplement newborn kids in a timely manner.

RECOMMENDED PRACTICES

a. check the doe's teats for good flow and colostrum quality. Any blockages or dried milk should be removed. Teats and udder should be clean to lower the risk of kids ingesting bacteria
b. assist kids to the udder to initiate nursing if necessary. Stockpeople should observe 2 or 3 feedings in the first 2 hours after birth
c. supplement colostrum (e.g., bottle feeding or esophageal tube feeding) if no signs of nursing are observed or likely not imminent within 2 hours after birth
d. supplement when dam's colostrum is low in quantity or poor in quality (e.g., clots, bloody, abnormal colour or consistency, signs of mastitis).

4.2.2 Colostrum Management for Artificially-Raised Kids

Cleanliness is critical when milking does and handling colostrum. Bacteria in colostrum restricts the uptake of immunoglobulins and can become a source of infection in young kids.

Quality of colostrum is critical to survival and the long-term health of newborn kids. Colostrum from the first milking of a doe immediately after kidding is richest in nutrients and immune properties and becomes diluted the longer it takes to remove the colostrum from the udder.

REQUIREMENTS

Newborn kids must receive their first colostrum feeding as soon as possible (within the first 2 hours is best) and no later than 6 hours after birth.

A newborn kid must be fed a minimum of 20% of its birthweight in colostrum in the first 24 hours (e.g., 600 mL for 3 kg kid divided into at least 3 feedings).

If not fed immediately, colostrum must be covered and chilled after collection to minimize bacterial growth.

Colostrum must not be left at room temperature.

Colostrum must not be thawed or heated using a microwave.

All colostrum equipment must be cleaned, sanitized, and dried after each use.

Each farm must have a stockperson competent in the proper method of tube feeding a newborn kid.

RECOMMENDED PRACTICES

a. colostrum from first milking should be fed within the first 24 hours
b. feed higher quality colostrum to kids under 24 hours old. Lower quality colostrum can be fed after 24 hours
c. heat treat colostrum for 1 hour at 56–60°C to reduce bacterial levels and increase availability of the immunoglobulins to be absorbed
d. increase amount of colostrum for kids in cold weather or when providing colostrum by tube feeding.

4.3 Raising Kids on Milk or Milk Replacer

Dairy kids are typically separated from their dams and are raised on milk or milk replacer. Orphans, rejected kids, and multiples are often separated from their dams and raised on milk replacer. Similar to managing colostrum, cleanliness and quality are key factors for good kid health. Spoiled milk will reduce consumption and contains an overgrowth of harmful bacteria that cause digestive upsets.

For more resources refer to *Appendix S – Resources for Further Information.*

REQUIREMENTS

Milk replacer powder must be well mixed to stay in solution, mixed at correct concentration, and deliver consistent nutrition to all kids in the group.

Kids must receive a volume and quality of milk or milk replacer that promotes health, growth, and vigour (32).

Milk and milk replacer must be kept fresh and not allowed to spoil.

Milk feeding equipment and utensils must be cleaned and sanitized after each use to reduce bacterial growth.

Automated milk feeders must be cleaned and sanitized as needed to maintain a sanitary feeding system.

RECOMMENDED PRACTICES

a. follow the manufacturers' instructions for mixing, scheduling, and feeding milk replacer
b. feed kids at least 15% of body weight in milk (i.e., 10 kg goat receives 1500 ml per day; 33)
c. ensure that milk replacer meets the dietary needs of goats
d. free choice feeding of cold (20°C [68°F]) milk replacer is preferred to limit feeding warm milk replacer
e. feed kids with nipple devices (bottle or kid bar) to minimize digestive problems and bloating
f. increase volume of milk replacer in cold weather (allows extra calories for keeping warm).

4.4 Weaning

Weaning should be a gradual process that allows a kid's developing rumen to start functioning as it transitions to an adult diet. Gradual weaning is preferable to allow full development of the digestive capacity, frame, and internal organs (53). Weaning shock will be lower for kids that have become adjusted to solid feed prior to weaning.

REQUIREMENTS

Does nursing kids (especially multiples) must receive adequate nutrition to produce sufficient milk to sustain their kids until weaning.

Dry feed or forage must be provided to artificially-raised kids starting at one week of age to promote rumen development.

Before weaning, kids must be consuming adequate amounts of forage, solid feed, and water daily to maintain growth and health.

Kids must not be weaned from milk before 6 weeks of age (69).

RECOMMENDED PRACTICES

a. provide a creep area to enable kids to access feed with less competition from adults
b. fine, higher-quality hay or forage should be accessible free choice
c. ensure that pastured kids start grazing pastures with low parasite contamination
d. consult your veterinarian regarding use of anticoccidials to help prevent intestinal damage and malnutrition caused by coccidiosis
e. stale or refused feed should be removed daily and before fresh feed is added
f. avoid weaning kids who are ill (70)
g. do not wean kids before they grow to 2.5 times their birth weight
h. gradual weaning, by limiting the nursing frequency or feedings of milk or milk replacer over several days, is recommended to reduce weaning shock and stress (70).

4.5 Grazing and Pasturing Areas

Goats are natural browsers and will consume up to 50% of their diet by nibbling shrubs and trees, if available. It can be challenging for late gestation does to derive adequate nutrition from low quality (over-mature) pasture.

REQUIREMENTS

Available pasture and/or browse must meet dietary needs.

The ration must be supplemented if there is insufficient forage quantity or quality to meet dietary needs or is inaccessible due to snow or ice cover.

Feed volumes/rations must be increased in extreme cold weather to allow for higher energy demands.

Stockpeople must ensure that pregnant does are able to meet dietary requirements necessary to support late gestation needs.

Application of fertilizers, pesticides, and herbicides onto pasture must be timed to prevent risk to animals (31).

RECOMMENDED PRACTICES

a. manage pastures and grazing areas to optimize forage quality and quantity
b. routinely monitor goats for evidence of gastrointestinal parasites
c. formulate mineral and supplements specifically for pastured goats based on season and production stage.

4.6 Feeding to Prevent Common Metabolic and Nutrition-Related Diseases

Effective control and prevention of nutritional and metabolic diseases requires understanding of the common causes of these diseases. Most can be prevented by proper diet formulation and feeding management with input from the herd veterinarian and nutritionist.

Metabolic diseases (e.g., pregnancy toxaemia) occur when body reserves of certain nutrients, such as calcium, magnesium, or energy cannot meet physiological needs. Nutritional diseases may be related to feeding management (e.g., enterotoxaemia and ruminal acidosis), deficiencies, toxicities, or imbalances (e.g., urinary calculi).

REQUIREMENTS

Controlling the risk of metabolic and nutrition-related diseases must be considered when formulating diets and feeding rations.

Feed and feeding management must be amended quickly when metabolic and nutritional diseases are identified.

RECOMMENDED PRACTICES

Enterotoxaemia

a. review feeding frequency, avoid sudden feed changes and overeating (e.g., accidental gorging on grain, high energy feed)
b. feed whole grains which encourage chewing and take longer to digest. Provide forages free choice with sufficient fibre length and digestibility that encourages chewing
c. implement a vaccination program for clostridial diseases to prevent and reduce enterotoxaemia

Ruminal Acidosis/Sub-acute Ruminal Acidosis (SARA)

d. balance the ration to meet and not exceed energy/protein needs of does
e. feed smaller servings of grain more often to prevent gorging
f. provide access to a free choice, high-quality forage of sufficient fibre length to reduce the risk of digestive upset and overgrowth of bacteria that produce lactic acid

Urinary Calculi and Urolithiasis

g. balance calcium and phosphorus in diet to a ratio of 1:5–2:1 to minimize crystal formation
h. diet for young male kids should be formulated to increase acidity of urine to minimize crystal formation and supply adequate vitamin A for dietary needs
i. provide salt (at least 1%) to encourage water consumption. Salt blocks or salt-mineral mixes can also be offered and should be readily accessible at all times
j. safe, clean, and palatable water should be available for bucks at all times that is easily accessible and low competition

Pregnancy Toxaemia

k. monitor pregnant does for changes in body condition. Does with a BCS under 3 require a higher energy ration to prevent further loss of BCS
l. monitor does with a BCS over 4 for signs of pregnancy toxaemia. Over-conditioned pregnant does should still have adequate feed intake to support multiple fetuses in late gestation
m. high quality forages (higher digestibility, less mature) should be directed toward pregnant does in late gestation
n. monitor does with multiple fetuses on lower quality pastures and feed close-up does more energy-dense rations to provide higher nutrition.

4.7 Drinking Water

Water consumption will vary depending on production system, breed, stage of lactation, milk production, diet, feed intake, salt intake, weather, and temperature conditions. When water intake is reduced, feed intake also decreases, which can become a welfare issue. Safe, clean, and palatable water must always be provided.

Water volumes required for maintenance of dry does may be as low as 2–4 L (0.5–1 gal) per day, while lactating goats may drink or consume 4–12 L (1–3 gal) per day depending on milk production. For each additional litre of milk produced, the doe must consume almost double that amount of water.

Snow is often consumed by pastured goats, but considerable volumes are needed to extract enough water to maintain nutrition.

REQUIREMENTS

All goats, including kids, must always have access to sufficient quantities of safe, clean, and palatable water.

Snow and ice are not acceptable as sole sources of water for goats.

RECOMMENDED PRACTICES

a. provide water at a target temperature of 15°C (59°F) and not lower than 5°C (41°F; 53)
b. test well water and surface water used for drinking at least annually for indicators of water quality (53)
c. access to surface water in pastures should not cause erosion or reduce water quality.

5 Husbandry Practices

Desired Outcome: To maintain content, productive, and healthy animals through good management practices.

5.1 Handling

Goats are subjected to different handling and management procedures within dairy, meat, and fibre production systems. Handling can be stressful to goats even when conducted for health and welfare reasons (e.g., medicating, hoof trimming).

Being aware of goat behaviours will facilitate handling and reduce stress and injury to both goats and stockpeople. Good handling facility designs should make use of goats' natural behaviours. Goats have a natural flight zone (refer to *Appendix G – Goat Flight Zone*) from stockpeople. An effective distance to follow a herd when trying to encourage calm forward movement, is 3–4 m (10–13 ft; 32). Using positive reinforcement during handling (e.g., a food reward) and habituating goats to handling areas by using familiar equipment can reduce stress during handling procedures (32). Unfamiliar humans, movement, shouting, and the presence of dogs—particularly if barking—can cause fear. Reducing fear in goats when handling can increase handling efficiency, reduce injuries, and create a calmer herd.

Goats learn from, and may remember, good and bad experiences. Previously learned aversion related to a stressful handling procedure may diminish over time if not repeated. Because goats have a strong ability to recognize and remember individual humans, fostering positive human-goat interactions is important for animal welfare (41).

Handling goats in groups reduces stress to individuals. Goats should be handled in a calm manner and care should always be taken to avoid injury (31).

5.1.1 Catching and Restraining

The objective is to choose an appropriate catch and restraint technique that will cause minimum stress and discomfort. Animals should first be calmly herded into smaller spaces such as a pen or handling system. Stockpeople can catch individual animals with the use of a crook, by holding onto a collar, using hand restraint under the jaw and over the poll of the head, or briefly by the back leg. Horned adult goats, but not kids, can be caught, held, and guided by the base of the horn (71). Goats are never to be lifted, dragged, or pulled by the tail, legs, ears, horns, neck, or skin/hair. Suggested equipment for restraining in place includes a halter, stanchion/head gate, head stall, and/or handling chute suitable for goats (31). Goats should be restrained for the least amount of time possible.

REQUIREMENTS

All stockpeople must understand goat behaviour and be competent in goat handling techniques.

Stockpeople must work calmly and quietly with goats at all times using the minimum force necessary.

All methods of restraint must allow for the quick release of the goat(s).

Goats must be handled at all times so as to minimize the risk of pain, injury, or distress.

Goats must not be subjected to mistreatment (including kicking, hitting, or tail twisting).

Electric prods must never be used.

Goats must not be left unattended while restrained.

RECOMMENDED PRACTICES

a. use well-designed and maintained handling systems and equipment (refer to *Section 2.6 – Handling Systems*)
b. familiarize goats with handling equipment and provide positive reinforcement to encourage preferred responses to future handling
c. use goats' natural behaviours to encourage free movement to desired pens or other locations (refer to *Appendix G – Goat Flight Zone*)
d. supervise goats when crowded in races (alleyways), pens, or yards for handling purposes
e. minimize isolation of individual animals. Goats should be able to see, smell, and hear other goats whenever possible and be returned to their herds as soon as possible
f. plan procedures to avoid extreme weather conditions and to minimize the frequency, duration, and degree of restraint
g. avoid inverting or holding goats on their sides or backs for longer than necessary during procedures. Care should be taken if the rumen is full or the animal is heavily pregnant (32).

5.1.2 Handling During Shearing

Angora goats may be caught by the horns or by the hair under the chin, but never by the hair on the rest of their body. During shearing, Angoras can also be acceptably controlled by sitting them between the shearer's legs.

5.1.3 Herding and Livestock Guardian Dogs

It is essential that dogs used for herding goats be well trained. If canine instincts are not properly managed, dogs may cause harm by chasing goats erratically, running through the herd, or becoming overly aggressive (e.g., nipping and biting).

REQUIREMENTS

Herding and livestock guardian dogs must not stress goats (e.g., by chasing, playing with, or biting).

Dogs must not have access to goats unless under the control of a stockperson (with the exception of trained and acclimated livestock guardian dogs; 32).

5.2 Yokes, Horn Bars, and Tethering Devices

Use of yokes, horn bars, or tethers carry risks to the goat. They may be less able to eat and drink normally, may get entangled or trapped, injure themselves, or be more vulnerable to predation. These devices should only be used as a temporary measure until fences/penning can be properly repaired.

Yokes and Horn Bars

Goats are sometimes fitted with yokes around the neck or have a bar attached horizontally across their horns (horn bar) with the effect of making the goat's head wider in order to prevent it from becoming entrapped in fences or penning. These devices are occasionally used on a temporary basis to control animal movement.

REQUIREMENTS

Yokes and horn bars must not cause pain, injury, or distress.

Animals must not wear a yoke or horn bar on a permanent basis.

Yokes and horn bars must always allow goats to access food and water.

RECOMMENDED PRACTICES

a. consider removing a goat from the herd who is repeatedly rescued, becomes entrapped, or escapes through fencing in good repair
b. ensure that goats are provided with adequate space, feed, water, enrichment, and are housed in compatible social groups to reduce time spent testing fences
c. observe goats to determine areas that allow escape or entrapment, and repair as needed.

Tethering

Tethering usually involves a length of rope tied to the goat's collar and then anchored to another object. Goats may sometimes be tethered to keep them within a building or pen or to graze areas where no fencing is present. Another form of tethering, which involves tying a leg to the collar to restrict movement, is not permitted.

The agility and mobility of goats makes them prone to becoming entangled. Tethering should only be done for the shortest time possible, and it is not an acceptable substitute for proper housing and fencing. Animals must always be supervised to be able to quickly correct issues of entanglement or entrapment and to prevent predator attacks.

REQUIREMENTS

Tethering devices must not cause pain, injury, or distress.

Animals must not be tethered continuously.

Goats must be directly supervised when tethered.

Goats that are restrained by tethering must also be:

- ***calm and trained to the conditions***
- ***provided with access to safe, clean, and palatable water, sufficient feed, and access to shelter***
- ***able to walk and move around without becoming entangled or entrapped.***

Goats must not be tethered if sick, compromised, pregnant, or nursing (78).

RECOMMENDED PRACTICES

a. ensure that the minimum length of a tether is 4 goat lengths.

5.3 Social Environment

Goats are herd animals and must have both physical contact with other goats and enough space to permit natural behaviour (e.g., running, playing, mutual interaction). However, they will remove themselves from the herd to give birth.

Each time a group of goats changes members, animals try to re-establish social dominance (or pecking order; 72, 73). The housing system should allow for goats, regardless of social order, to be safe from fighting or bullying.

Goats can become stressed and depressed and refuse to eat if kept alone (74, 75, 76, 77). This can become an issue for goats recovering from illness, or in isolation before joining a new herd.

REQUIREMENTS

Goats in individual pens must be able to see and/or hear other goats or companions.

Goats must be monitored for, and prompt action taken when bullying, injuries, and drop in feed intake or body condition scores are observed.

RECOMMENDED PRACTICES

a. house goats in compatible groups
b. add new goats to a pen before returning the main group to that pen
c. add multiple goats (rather than a single goat) to an existing group
d. provide extra space per goat when blending new groups
e. monitor goats after moving to assess if they have adapted to their new environment
f. sell breeding does or kids with at least one companion.

5.4 Predation Control

Predation of livestock by wild, feral, or domestic animals can have severe consequences on animal welfare by causing fear, stress, pain, injury, or death. Goats that are attacked are often killed or left with serious injuries, often requiring euthanasia. Those that are chased but not injured also experience considerable stress (e.g., pregnant does may abort). Extreme exertion from running can cause muscle damage.

There are many management practices that producers can employ to try to reduce the threat of predation. Methods of predator control may include supervision, fencing, housing indoors, use of livestock guardian animals, and lethal control. Livestock guardians include dogs, llamas, and donkeys. Guardian animals are to be treated with the same care and consideration as the goats.

REQUIREMENTS

Producers must implement a strategy to minimize predation risk suitable for their farm, animals, and the predator(s) being considered.

Producers must provide prompt and appropriate care for goats that have been attacked by predators (refer to* Section 6 – Health Management *and* Section 8 – Euthanasia and On-farm Slaughter*).

RECOMMENDED PRACTICES

a. predation control strategies should be reviewed and improved as necessary following predation-related injuries or deaths.

5.5 Identification

Animal identification is essential to many aspects of a successful goat operation, including animal health. Unique and permanent identification can include approved RFID tags on ears or tail webs, leg bands, and tattoos. Federal identification regulations must be followed.

While there is immediate short-term pain when a goat is tagged or tattooed, long term pain is unlikely provided the site is not damaged and does not become infected. For that reason, it is important to ensure that the applicators, tags, ears, tail web, and the stockperson's hands are clean and dry before the procedure.

REQUIREMENTS

Animal identification must be in compliance with current government regulations.

Stockpeople must ensure that all identification materials are suitable for goats.

Goat identification must be performed or supervised by a competent stockperson.

Stockpeople must use application equipment that is in good working order and maintained according to manufacturer's instructions.

Stockpeople must employ proper hygiene practices to reduce potential infections and ensure that infected tagging sites or tears are properly treated.

When using ear or tail web tags, stockpeople must:

- ***use a tag suitable for the age, size, and breed of goat***
- ***use 2 tags maximum per ear***
- ***ensure the tag is positioned correctly to avoid excess bleeding or catching on objects.***

Branding goats must not be practiced.

Ear notching must not be practiced.

RECOMMENDED PRACTICES

a. all goats should have a permanent and unique form of identification within the herd
b. apply identification at times when fly activity is low
c. consult a veterinarian if severe infection or other problems develop.

5.6 Hoof Trimming

Proper attention to hooves is a key component of animal care. Hoof conditions affect animal health and welfare. Hooves should be checked regularly for excess growth and disease.

Hoof trimming is done:

- to promote proper hoof conformation and prevent lameness (refer to *Section 6.2.1 – Lameness*)
- to maintain a flat sole surface, thus preventing dirt and manure from being entrapped.

Hoof growth is influenced by animal characteristics (e.g., breed, structure, shape, and colour of hoof) and animal management factors (e.g., soil type, moisture, diet, and housing). As a result, the need for, and frequency of, hoof trimming will vary. Kids reared indoors benefit from routine trimming which should start no later than 6 months of age. Hooves are more easily trimmed when soft (e.g., following heavy dew or rain). When trimming, goats may either be restrained in a standing position, seated between the legs of person restraining the goat, or in a trimming chute.

REQUIREMENTS

Hooves must be inspected regularly (minimum every 6 months) and trimmed as required to maintain hoof health and goat well-being (refer to* Appendix H – Properly Trimmed and Overgrown Hooves*).

Hoof trimming must be performed by, or under the supervision of, competent stockpersons.

Stockpeople must have the ability to identify signs of overgrown hooves, foot rot, and other diseases.

Trimming equipment must be clean and well maintained.

Equipment must be disinfected between animals after use on diseased feet or hooves.

RECOMMENDED PRACTICES

a. plan hoof trimming to minimize the need to trim during periods of stress (e.g., late gestation, hot weather)
b. avoid trimming Angora hooves within a week prior to shearing to reduce the subsequent chance of injury to the goat and shearer.

5.7 Castration

Producers should consider whether castration of male kids is necessary.

Male kids can be sexually mature as young as 3 months of age. Castration is not likely required where kids are marketed at a young age or can be kept separated from females (does and doelings) after reaching puberty. If these conditions cannot be met, then castration is advisable to prevent unwanted pregnancies.

All methods of castration, at any age, cause pain. Pain relief reduces the impact of castration on welfare and must be used.

Drugs effective for pain relief in food animals are extra label drug use (ELDU) in goats and must be prescribed by a veterinarian (refer to *Section 6 – Health Management*). Desensitization of the scrotum and its contents can be achieved by the use of an injectable local anesthetic. Post-operative pain control (analgesia) can be achieved when a non-steroidal anti-inflammatory drug (NSAID) is administered at the time of the procedure.

There are 3 main methods of castration: rubber ring (i.e., banding), clamp (e.g., Burdizzo), and surgical. Surgical castration is always effective but there are additional risks of bleeding, infection, and possible evisceration (33). While clamp castration has the advantage of not creating an open wound, there is a higher risk of failed castration and ensuing tissue problems due to improper technique. Rubber ring castration is simple to use and very effective, but proper technique is still important. All are acceptable methods with pain mitigation. The least painful method is to combine a rubber ring with a clamp while using pain control (79).

There are fewer adverse outcomes to castrating bucklings at a young age (33). As bucklings age, the size of the scrotum and associated structures increase, which when castrated can give rise to increased inflammation and pain until healing occurs. After 12 weeks of age, the only option is surgical castration performed by a veterinarian. To avoid disruption of colostrum intake, it is recommended that bucklings not be castrated during the first 24 hours after birth (80). However, castration should be carried out as soon as possible afterwards.

REQUIREMENTS

A decision to castrate must be based on a welfare risk-benefit analysis rather than routine.

Producers must work with their veterinarian to develop practical, safe, and effective protocols for reducing pain resulting from castration.

Castration must only be done by a competent person after training with a veterinarian or other competent person.

If using a local anesthetic, it must only be administered by a competent person after training by a veterinarian.

Pain control (analgesia), such as NSAIDs, must be provided at the time of castration.

Castration of bucks beyond 12 weeks of age must be performed by a veterinarian using anesthesia and perioperative analgesia.

REQUIREMENTS (continued)

All castrations must meet the method, age range, and pain control use Requirements stipulated in Table 5.1 below:

Table 5.1 – Method, Age Range, and Pain Control Requirements for Castration

Method	Age Range	Mode of pain control required
Rubber ring and clamp	24 hours–10 days	Analgesia
Rubber ring	24 hours–10 days	Analgesia
Rubber ring	11–14 days	Local anesthesia and analgesia required
Clamp castration/ Emasculatome (e.g., Burdizzo)*	Age of the kid may vary by breed and animal when this procedure is suitable Older than 12 weeks of age, to be completed by vet	Local anesthesia and analgesia required
Surgical – Cut and pull	24 hours–7 days	Local anesthesia and analgesia required
Surgical – Emasculator – veterinary procedure only	Older than 7 days	Local anesthesia and analgesia required

**The size of the scrotum and testes must be large enough to allow proper clamp and crush of the spermatic cords without crossing the middle of the scrotal neck. Scrotum and clamp size must be appropriate to perform procedure correctly.*

Producers must monitor for signs of post-operative complications, consult with their veterinarian, and take appropriate corrective action if needed.

RECOMMENDED PRACTICES

a. bucklings should be left intact in management systems where they are marketed prior to puberty or reared separately from females
b. discuss tetanus vaccination with the herd veterinarian when castration will leave an open wound
c. bucks intended to be retained as adult wethers may benefit from delaying castration beyond 8 weeks of age to allow development of the urethra and to reduce the risk of urinary calculi (81). Urinary calculi should be primarily managed with a balanced diet (refer to *Section 4.6 – Feeding to Prevent Common Metabolic and Nutrition-Related Diseases*)
d. consult your veterinarian on the use of sedation to reduce handling stress.

5.8 Disbudding

Disbudding is a procedure that removes the horn bud before it attaches to the skull (7, 8). Horn attachment may begin at different times based on the breed and sex of the goat but generally begins at 21 days of age.

In Canada, the majority of dairy goats retained for milking purposes are disbudded as kids to avoid entrapment in housing and milking facilities (41). Dairy and meat kids destined for meat production are often not disbudded.

Kids have thin skulls and are susceptible to injury from improper disbudding procedures (84). High

temperatures, holding the iron to the head too long—or with too much pressure—can lead to damage to the skull and brain, possibly leading to death (7, 8, 33, 80, 82, 83, 84, 85).

Kids should be returned to their normal surroundings as soon as possible after the procedure.

Further research is required to develop a reliable method for sedation and local anesthesia during disbudding. As a result, requiring local anesthetic at this time is not possible. Producers and veterinarians who have had good success using local anesthetic should continue to do so. It is strongly encouraged that veterinarians and producers follow the evolving research on pain control during disbudding and adopt effective strategies as they become available, understanding that these may become Requirements in the future.

Some goats are born polled (i.e., naturally hornless) but this is a very rare occurrence. The polled condition in goats has been linked to an intersex condition where female goats have both male and female characteristics and are infertile (33, 86). Polled females should not be bred to polled males. However, striving to develop polled fertile goats is a project that should be pursued.

REQUIREMENTS

Disbudding must only be done by a competent person after training with a veterinarian or other competent person.

Pain control (analgesia), such as an NSAID, must be provided at the time of disbudding.

If using a local anesthetic, it must only be provided by a competent person after training by a veterinarian.

Disbudding must only be performed on kids whose horn buds have not attached to the skull, usually between the ages of 7 to 14 days, and not more than 21 days of age.

After disbudding, kids must be observed for several days for signs of illness or pain such as decreased milk intake, decreased activity, hunched posture, and a lack of interest in the environment.

Hot iron disbudding is the only acceptable method of disbudding goats. Caustic paste and clove oil must not be used.

RECOMMENDED PRACTICES

a. when disbudding, an NSAID should be used in combination with either a sedative or local or general anesthetic, in consultation with your veterinarian, to provide the most pain control
b. remove the cauterized horn bud to improve effectiveness of disbudding and prevent scurs
c. discuss tetanus vaccination with the herd veterinarian when disbudding.

5.9 Dehorning

Dehorning is the process of removing horn tissue after the horn bud attaches to the skull (7, 8). Horn attachment may begin at different times based on the breed and sex of the goat but generally begins at 21 days.

For some horned goats, it may be necessary to trim the tips of the horns (i.e., tipping) to prevent injury from ingrown scurs, interference with sight, or normal eating and drinking (33). The amount of horn trimmed should be kept to a minimum (32). To avoid damage to soft internal horn tissue, which is sensitive and bleeds easily, stockpeople should trim in no more than 2.5 cm (1.0 inch) increments. A veterinarian should be consulted 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 goat. A licensed veterinarian must perform such procedures.

Dehorning is a highly invasive procedure and must be avoided unless necessary for the welfare of the goat. Alternatives to dehorning, such as regrouping aggressive animals or modifying housing or fencing to reduce entrapment must be considered before dehorning (33).

REQUIREMENTS

Dehorning must not be performed unless necessary to protect the health and welfare of the goat and must be performed by a licensed veterinarian using a sedative, general or local anesthesia, and perioperative analgesia, regardless of age (41).

Horned goats or goats with scurs must be monitored to ensure that no part of the horn/scur is in contact with the body or face (32).

Minor horn trimming ("tipping") must be performed by a competent person, making sure to avoid sensitive internal tissue.

Dehorning using banding, gougers, Barnes dehorner, or Keystone dehorner (i.e., guillotine) is prohibited.

Dehorned goats must be observed several times in the first 24 hours for excessive bleeding, and daily for infection until healed.

Broken horns with excessive bleeding or signs of infection must receive immediate veterinary attention.

RECOMMENDED PRACTICES

a. dehorning should be conducted outside of the fly season when possible
b. discuss tetanus vaccination with the herd veterinarian when dehorning.

5.10 Other Management Practices

Occasionally some goats are born with wattles on their neck or cheek. These appendages do not affect their health or welfare and should not be removed.

Multiple teats, depending on their position, can be a hindrance when machine milking or for nursing kids. Goats with webbed or dysfunctional teats should be culled as this trait can be passed on to offspring.

REQUIREMENTS

Removal of extra teats must be done at as early an age as possible and must only be performed after training by a veterinarian or by a competent person using proper technique and well-maintained sanitary equipment.

Pain control must be provided in consultation with a veterinarian.

5.10.1 Breeding

Producers should plan mating periods to coincide with expected weather conditions, available shelter, and available labour at time of kidding.

Bucks

Bucks should be managed so that they have suitable body condition scores prior to the normal breeding season and before they are used for breeding (refer to *Section 4 – Feed and Water*).

To avoid unplanned matings, bucks are often kept separate from does. Isolation, however, is stressful for goats (74, 75, 76, 77). If housed with does, and mating is not desired, buck aprons can be used to prevent mating. Whenever possible, bucks should be kept in the company of compatible males. Aggressive large bucks should not be housed with smaller timid bucks, which could result in injuries and stress.

When semen collection is needed, whenever possible, a less invasive procedure (e.g., an artificial vagina) should be used in preference to electroejaculation (87).

Due to the natural behaviour of establishing dominance, placing more than 1 buck at a time with does can result in serious injury caused by fighting. Their behaviours need to be closely monitored and action may be required to avoid injuries.

Does

Does and doe kids should be managed and fed so that they have suitable body condition scores at the times of breeding and kidding (refer to *Section 4 – Feed and Water*). Doelings may be fertile as early as 4 months of age and need to be kept separate from fertile males (including bucklings) until old and large enough to breed.

Where natural mating is conducted, attention must be given to the health status of the animals to prevent transmission of infectious diseases. The body weight and size of the bucks used in natural breeding must be appropriate to the size and physical development of the does or doelings in order to prevent injury or undue stress to mounted females.

REQUIREMENTS

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

Bucks must be managed by taking into account the risk of aggressive behaviour to avoid possible injury to other bucks and stockpeople.

Doelings must be a minimum of 65% of their breed's expected adult weight at time of breeding.

The body size and weight of bucks used in natural breeding must be appropriate to the size of the does.

Semen collection and transcervical artificial insemination must be conducted by a competent stockperson.

Electroejaculation, when performed, must be done by a licensed veterinarian.

Laparoscopic artificial insemination or embryo collection and transfer must be done by a licensed veterinarian.

RECOMMENDED PRACTICES

a. keep accurate breeding records
b. ensure that marking harnesses for bucks are properly fitted and checked daily. They should not be left on for longer than necessary
c. limit fighting by not introducing unfamiliar bucks to one another during the breeding season.

Pregnancy and Kidding

Newborn kid survival is highly dependent on adequate nutrition throughout gestation to assure proper placental and fetal growth. To determine specific needs, refer to *Section 4 – Feed and Water* and consult a

qualified ruminant nutritionist or veterinarian.

Angora goats should be shorn or crutched prior to kidding to expose the teats to the newborn and facilitate colostrum intake of the newborn (refer to *Appendix I – Hair Problems around Genitals*).

Does kidding on pasture should be minimally disturbed. They should, however, be observed frequently enough to ensure that any problems are given prompt attention. Water and feed should be available where kidding is occurring. A natural or constructed sheltered area must be available.

Does require a clean and dry area in which to give birth. Where kidding and claiming pens are used, every effort should be made to prevent the spread of infection by providing clean, dry bedding that is regularly replaced (88). Refer to *Section 2 – Housing and Handling Facilities*.

Does should be allowed to kid without intervention, if possible. Stockpeople should become familiar with normal kidding behaviour such that problems can be recognized early. When assistance is provided, it must be by a competent attendant using good standards of hygiene and accepted veterinary techniques.

The welfare of both does and kids can be compromised through difficulty at birth, known as dystocia, and assistance may be required. Following a difficult birth, kids may be delayed in performing natural behaviours like raising their heads, standing, and suckling. After a long labour, does may have a delay in standing and cleaning the newborn (32).

Knowing when and how to provide or call for assistance during kidding is an important management skill. Signs that a doe may require assistance include:

- doe has been straining for more than 30 minutes with no 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 kid appears to be stuck. There has been no progress for several minutes since the limbs have appeared
- the head is visible with no limbs present
- the doe is weak and exhausted (32).

Aborting does, does at risk of aborting, and kidding does may be infected with diseases potentially hazardous to people (i.e., zoonotic diseases in pregnant women, people who are immunocompromised, or who have heart problems). It is recommended that those at risk should be in consultation with their herd veterinarian and physician and inform themselves of those risks.

REQUIREMENTS

Kidding must be frequently observed, and timely action taken as required, while keeping disruptions and disturbances to a minimum.

All stockpeople must be able to recognize the signs of kidding difficulty and know when and how to provide appropriate assistance and when to seek assistance from a competent person or veterinarian.

Hands must be washed or new gloves must be worn when kidding assistance is required.

When goats are housed indoors, a clean dry bedded area for kidding must be provided.

A clean dry area must be provided for does kidding on pasture, with food and water readily available, so does will remain with the newborn kids.

RECOMMENDED PRACTICES

a. ensure that the doe is capable of producing high quality colostrum through management of nutrition and udder health during the final 6 weeks of gestation
b. ensure that all stockpeople can palpate and identify udder problems, such as mastitis
c. on dam-raised operations, identify and cull does with poor mothering instincts or milk supply
d. should more than 10% of does require assistance delivering kids, a veterinarian should be consulted for possible causes and an action plan implemented to reduce the number of future incidences (32).

Neonatal Care

Diseases in kids from birth to weaning can be minimized through proper nutrition of the doe, by providing a clean, sheltered environment that includes good air quality, and knowledge of normal goat behaviour.

Colostrum intake is essential for the health and well-being of all kids (refer to S*ection 4.2 – Newborn Kids and Colostrum*).

When kids are dam raised, maternal bonding is very important to kid welfare and survival. Mismothering generally results in death of the newborn through starvation. A good understanding of normal goat behaviours and frequent observation of does, udders, and kids are important to assess any problems. The use of kidding and claiming pens can promote dam-kid bonding.

There are a number of reasons why a kid may be removed at birth and reared artificially. These include disease control programs, the dam is unable (e.g., mastitis) or unwilling to raise the kid, the kid is weak or ill, or the dam is milked for human consumption.

REQUIREMENTS

Newborns that do not nurse voluntarily must be provided the first colostrum feeding as soon as possible—first 2 hours of life is best.

Newborn kids must be monitored no less than 4 times per day for evidence that they have suckled and for signs of starvation, hypothermia, and frostbite. Prompt, appropriate corrective action must be taken if problems are observed (32).

Continual restraint of a doe for the purposes of fostering must not be practiced.

RECOMMENDED PRACTICES

a. have a warming box available. When unsure, seek advice from a competent stockperson
b. treat navels with a suitable disinfectant at birth to reduce risk of joint and navel ill
c. use kidding and claiming pens on dam raised operations in indoor systems to allow the maternal bond to be firmly established between doe and kids before they are returned to the herd.

5.10.2 Milking Procedures

Cleanliness of bedding and yards will assist with cleanliness of udder and teats and mastitis control. The benefits of always providing adequate dry bedding for milking does should not be underestimated in reducing the incidence of udder infections.

Establish regular routines for milking times to avoid stressing the goats (31).

Access routes to the milking parlour should be safe and well illuminated. The floors should have good traction and be kept clean.

The pre-milking holding area on farms with milking parlours is the area of highest animal density and opportunity for injury. Pen and parlour gates must operate freely and quietly. Hinges should be lubricated and latches padded to reduce noise. Latch protrusions should be reduced to maintain the safety of the goats.

Fans, sprinklers, or other technology should be used to moderate temperature extremes.

When concerned about mastitis, check the udder by feeling for heat or hardness and using a strip cup to assess foremilk prior to each milking. The milk should not be milked into the hand as this spreads organisms from teat to teat and goat to goat.

To avoid infection of the mammary glands, the teats should be clean prior to milking and treated with a teat dip solution as soon as milking is finished (89). Refer to *Dairy Goat Udder Health Guide* for further details on milking best practices and mastitis management (61).

REQUIREMENTS

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

Procedures must be in place to prevent mastitis.

All applicable regulations pertaining to milking hygiene must be practiced.

Milking must be frequent enough to prevent pain due to mammary engorgement.

All stockpeople milking does must be competent or under direct supervision of a competent milker.

Does must not be dried off by limiting access to water.

Does must not be dried off by removing access to feed.

RECOMMENDED PRACTICES

a. develop good milking practices including:
   - maintaining high standards of hygiene
   - following a regular routine
   - keeping records of udder health problems and treatment, abnormal milk, and milk production and quality
   - following a mastitis control strategy in your herd health and welfare plan
   - ensuring annual inspections of milking equipment by a qualified person

b. milk does with high somatic cell counts and/or mastitis last
c. milk once per day for several days before dry off (i.e., to help reduce milk production, thus decreasing the doe's discomfort)
d. milking parlours should only be used for milking. Avoid painful experiences from being associated with the place of milking.

5.10.3 Fibre Management

Fibre goats are raised for mohair or cashmere. Mohair, the product of a single breed—the Angora—must be sheared. Cashmere is the winter down on all other goat breeds. Cashmere is usually combed off the goat in the spring with the natural shedding cycle of the winter coat.

Mohair grows quickly and care must be taken to keep the face and genitals clipped to prevent blindness, irritation, soiling, and urine scalding.

Shearing

When shearing goats, consideration should be given to the time of year, weather conditions, and the available shelter. Avoid sub-zero days for chills and the middle of the summer for sunburn.

A competent shearer should shear the goats in order to reduce the time a goat is restrained.

Steps must be taken to minimize shearing injuries. Shearers should be reminded that the goat's skin is looser and thinner than that of a sheep, and extra care should be taken. Special goat combs with 17 or 20 teeth should be used to prevent cuts.

Stockpeople and shearers should be aware of the dangers of spreading certain diseases, such as caseous lymphadenitis and lice, through the use of contaminated shearing equipment. Shearing equipment should be treated with a disinfectant between herds and between infected or suspect animals within the herd. A hired shearer should also arrive in clean clothes and footwear to prevent the introduction of external parasites and disease into the herd (32).

REQUIREMENTS

All Angora goats must be shorn at least once a year and more frequently around the genitals and face.

Shearing must be performed by, or under the supervision of, a competent, experienced shearer.

Shearing of pregnant does in the last month of gestation must only be performed by a competent, experienced shearer.

All shearing-related injuries must be attended to promptly. Major injuries (e.g., severed milk vein) must receive first aid and be attended to by a veterinarian.

Farms must have a sheltered, suitable area that can be used for shearing. Shearing areas must be adequate in size, clean, and well-lit.

All shearing equipment and any clothing that moves between farms with the shearer must be cleaned and disinfected between herds at a minimum. If there is a known disease transfer risk between animals, all equipment must be disinfected between animals within a herd.

When planning shearing, producers must consider the time of year, expected weather, and available shelter. Steps must be taken to prevent negative outcomes associated with shearing (e.g., hypothermia, sunburn).

Goats must not be sheared in cold weather unless appropriate shearing comb lifters are used to leave enough fleece on the body for thermal comfort.

Provide feed, water, and shelter and/or shade for goats for shearing and afterwards.

RECOMMENDED PRACTICES

a. crutch full fleece does if they cannot be shorn prior to kidding to expose udder, teats, and perineum
b. feed should be withheld a maximum of 12 hours and a minimum of 6 hours before shearing to reduce the animal's discomfort from a full rumen during shearing. Water should remain available at all times
c. shear infected or suspect animals last
d. cashmere goats should only be combed when they have started to naturally shed in the spring.

6 Health Management

Desired Outcome: Improve animal well-being through proactive disease prevention and monitoring herd health, while providing prompt, appropriate treatments.

Pain and suffering caused by injury and illness adversely affects a goat's well-being. Good care and good animal health are key components of good welfare.

Many factors affect an animal's ability to remain healthy. These include:

- diets that meet nutritional requirements
- good feeding management, preventing contamination and spoilage
- preventing nutritional and metabolic diseases
- good air quality
- adequate shelter
- strong immunity including transfer of passive immunity in newborn kids
- low-stress environment
- low risk of exposure to pathogens
- husbandry and management practices that promote health (i.e., hoof care)
- genetic susceptibility to disease.

Disease prevention and control includes proactive measures that are used to reduce the number and scope of animals affected by disease.

A herd health plan is a key management tool to apply those measures and includes monitoring the health and productivity of the herd, as well as a plan to investigate when disease issues arise. The following topics are all important elements of a herd health plan.

6.1 Preventing Injuries and Disease with Good Management Practices

Prevention and control are preferred over treatment when working toward optimal animal health and welfare.

Complete, accurate, and reliable record keeping and analysis is a key tool in maintaining and improving the health of the herd. It is important to track animal health and performance and to flag areas where disease may be emerging, or performance is sub-optimal. This is best accomplished when all animals have permanent, individually unique identification (refer to *Section 5.5 – Identification*). Records are also critical to assuring that animals are properly treated, drugs are given appropriately, and that meat and milk withdrawal times are followed.

RECOMMENDED PRACTICES

a. develop, follow, communicate, and provide training on protocols for disease prevention and control. These should include:
   - biosecurity practices
   - isolating sick animals, new introductions, and animals returning to the herd
   - vaccination programs
   - other control programs for common and serious diseases (refer to Table 6.2)

b. purchase goats from herds with equal or greater health status than your herd
c. participate in continuing education activities related to goat health and welfare
d. participate in goat health and welfare programs (e.g., CAE eradication programs)
e. develop a written herd health plan (preferably in partnership with the herd veterinarian)
f. use and share the herd health plan with all stockpeople involved in animal care.

6.1.1 Recognizing Injury and Disease in Animals

Those responsible for the daily care of goats need to be able to recognize signs of illness and injury and be familiar with normal behaviour. Goats are prey animals that will often conceal signs of weakness or illness, making detection of disease more challenging.

The frequency of observation depends on stage of production of the goat but must be timely enough to protect the health and welfare of the herd. Recognizing early signs of a disease and injury will improve treatment effectiveness, reduce disease spread, and enable early culling decisions.

Animals should be observed in their pens, pastures, or milking parlours regularly to identify those which are injured, ill, have changes in appetite or feeding behaviour, have lost body condition, are lame or poorly mobile, or have signs of heat or cold stress.

REQUIREMENTS

Animals must be observed daily.

Stockpeople must be knowledgeable about goat behaviour and be able to detect abnormal behaviour and signs of injury and illness.

Stockpeople must be able to identify emergency situations (i.e., animals in need of immediate attention) and take appropriate action.

RECOMMENDED PRACTICES

a. observe goats multiple times a day when they are at higher risk of illness or injury, e.g., animals which are:
   - in late pregnancy or due to kid
   - very young (i.e., < 2 months of age)
   - being treated or are in recovery
   - herd mates of diseased animals (are at higher risk of developing disease)
   - where changes in health or behaviour have been noted for further observation.

6.1.2 Managing Sick, Injured, or Cull Animals

Sick or injured goats may benefit from being separated from herd-mates to eliminate competition for feed and space, to allow for better observation and treatment, and to help prevent the spread of disease. Ideally, isolated goats must be able to see and/or hear other goats (74, 75, 76, 77).

Stockpeople should work with the herd veterinarian to become familiar with common health problems and recommended treatment protocols. Prompt decision-making and action are vital to ensure the welfare of sick and injured goats.

Goats marked for culling due to disease or injury and that are reasonably healthy should be removed from the herd in a timely manner before their condition deteriorates. Early identification of health issues is key to prevent subsequent suffering.

If treatment is not effective, or will not be provided, an alternative decision must be made immediately. Appropriate action will depend on the goat's condition and applicable laws. Action may include euthanizing the animal, shipping to slaughter, or slaughtering on farm (refer to *Appendix J – Example of Decision Tree for Euthanasia*).

REQUIREMENTS

When goats are sick, injured, or suffering, one of the two following actions must be taken without delay:

1. Treatment—must be safe and may include:

- ***pain control***
- ***veterinary drugs***
- ***nursing care***
- ***monitoring for response to treatment.***

2. No Treatment—goats must not suffer while waiting to be:

- ***culled or sold to slaughter (if suitable for human consumption and transport; refer to* Section 7 – Transport*)***
- ***slaughtered or euthanized on-farm.***

Written records of disease events and treatment must be kept.

If treatment is not effective, or will not be provided, an alternative decision must be made immediately.

RECOMMENDED PRACTICES

a. develop standard operating procedures and treatments with the herd veterinarian to ensure that individual treatments are performed appropriately (correct dosage and duration) to optimize response to treatment
b. manage sick or injured goats so that, with minimal stress, they can be cared for and treated, and the risk of disease transmission is reduced
c. goats should be isolated when it is necessary to:
    - reduce the risk of disease transmission
    - enable treatment
    - reduce possible harm to the affected animal
d. diagnostic investigations such as postmortems and laboratory tests (e.g., fecal egg counts, milk cultures, blood tests) should be used routinely to support treatment and control decisions
e. review records to allow for analysis and identification of disease trends and use these trends to inform herd health programs
f. consider culling animals that are sources of infection to other goats and cannot be cured or properly isolated (e.g., *Staphylococcus aureus* mastitis, CAE, Johne's disease)
g. consult the herd veterinarian before administering any alternative medicines/therapies.

6.1.3 Herd Health Management and Veterinary Care

Veterinarians are an important resource for helping producers establish and implement effective herd health and welfare plans. The herd 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 goats, as well as monitoring disease and health trends. Veterinary services are most effective when applied proactively.

Veterinary-Client-Patient Relationship (VCPR)

A valid VCPR ensures that the veterinarian is familiar with the herd and its management practices. A VCPR is established and maintained through timely visits to the farm which can include scheduled herd health visits and emergency calls. Telephone, texted photos and videos, email, or video calls ("telemedicine") also work well, especially over longer distances.

While the definition of a VCPR varies by province, all contain the same components (90):

- 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 in Goats

Most livestock drugs and vaccines can only be prescribed and dispensed by a licensed veterinarian. A veterinarian is only allowed to prescribe and dispense drugs and vaccines 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 drug use in goats is considered extra label drug use (ELDU), these can only be accurately provided by a licensed veterinarian within a VCPR.

REQUIREMENTS

All producers must establish and maintain a working relationship with a licensed veterinarian (VCPR).

Extra Label Drug Use (ELDU) must be prescribed by a veterinarian.

Veterinary prescription drugs, including antimicrobials (Category I, II, and III of Medically Important Antimicrobials), must be prescribed and/or dispensed by a licensed veterinarian.

All veterinary drugs to be used in goats must be safe and:

- ***must have a Canadian Drug Identification Number (DIN)***
- ***must be stored according to label directions***
- ***must not be used after expiration.***

RECOMMENDED PRACTICES

a. work with the herd veterinarian to develop herd protocols for disease control and prevention
b. update protocols at least annually and after significant health events or changes to housing or management. Protocols should be communicated to all stockpeople
c. keep all veterinary prescriptions and medical records in a manner that they can be readily accessed by all stockpeople and protected from damage
d. in addition to herd visits, consider using alternative methods of communication (texting or emailing descriptive pictures and videos, video calls) when seeking advice from the herd veterinarian; also known as telemedicine.

6.1.4 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 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.

6.2 Herd Management Programs

6.2.1 Lameness

Lameness in goats is a serious condition affecting welfare and must not be ignored. Lame animals are in pain and have difficulty moving to find food and water. As a result, they quickly lose body condition and may be more susceptible to disease (e.g., pregnancy toxaemia; 91, 92). Lame animals also have reduced growth, milk production, and colostrum quality and quantity (93, 94).

In order to treat effectively, it is critical to determine the cause of lameness in goats, which most commonly include those listed in Table 6.1.

Table 6.1 – Common Causes of Lameness in Goats

Lameness from conformation	**Caused by**
Poor foot and leg conformation (fallen pasterns, straight hocks, misshapen toes)	Age/genetics
Lameness from disease	**Caused by**
Laminitis (abnormal, poor-quality hoof, inflammation, deformed bone)	Complication of infection, e.g., metritis (uterine infection), pneumonia
Inflammation of joints and bursae	CAE (Caprine Arthritis Encephalitis)
Foot rot, digital dermatitis	Contagious bacteria
Joint ill (swollen or infected knees and hips)	Bacteria from environment Poor colostrum management
Lameness from housing/husbandry	**Caused by**
Hoof overgrowth	Infrequent or incorrect trimming
Foot scald or abscesses, hoof infections	Wet or dirty environment Trapped materials in hoof
Fractures, sprains, spinal injuries	Unsafe handling or housing facilities Aggressive behaviours

Table 6.1 – Common Causes of Lameness in Goats (continued)

Lameness from nutritional imbalances	Caused by
Laminitis	RA (rumen acidosis) and SARA (sub-acute rumen acidosis)
Rickets (deformed joints, bow-legged)	Calcium or phosphorus imbalance Vitamin D deficiency
White Muscle Disease	Vitamin E—selenium deficiency

Adapted from Goat Code of Practice Scientific Committee (2020) Code of practice for the care and handling of goats: Review of scientific committee. *Lacombe, AB: National Farm Animal Care Council.*

Moderate lameness is defined as (95):

- moderate limp
- affected limb(s) identifiable.

Severe lameness is defined as:

- severe limp
- unable to bear weight on all 4 legs
- may walk on knees or walk with limbs stretched and not bending joints (i.e., goose-stepping). For more information on lameness scoring (normal and abnormal locomotion scores) refer to *Appendix K – Lameness Scoring.*

REQUIREMENTS

Stockpeople must be able to recognize lameness.

Lame goats must be assessed and action taken without delay.

When the level of moderate to severe lameness in the herd is high (i.e., ≥ 5% of animals are lame), the cause must be investigated and corrective action taken.

Lame goats that are non-ambulatory or are experiencing moderate to severe pain and do not respond to treatment must be euthanized.

RECOMMENDED PRACTICES

a. develop and implement a farm-specific protocol for hoof care and treatment of common diseases that cause lameness
b. keep records of date of hoof trimming for each animal and include any abnormal findings
c. examine animals with previous foot diseases or lameness more frequently
d. lameness levels in the group or herd should be scored in order to monitor the level and severity of lameness
e. consult with the herd veterinarian to investigate cause(s) and recommend/perform treatments or preventive measures when the level of moderate to severe lameness in a group of animals (e.g., milking does) is high (i.e., ≥ 5% of animals in that group are lame).

6.2.2 Disease Prevention and Control

Keeping goats healthy and thriving is an important cornerstone of animal welfare. To do so requires the use of proactive measures to prevent diseases from occurring or to control diseases that may be present in the herd.

To understand if a disease in a herd is of concern, there is a need to determine how much disease is occurring and when that level becomes harmful to the welfare of the herd.

Acute diseases (those that have a sudden onset and short duration, e.g., kid diarrhea) are measured in terms of new cases over a period of weeks or a month. Farms tracking the occurrence of acute diseases will often have a threshold which, if surpassed, will trigger a reconsideration of current disease prevention and control strategies.

Chronic diseases are those diseases where there is a long period between time of infection and when signs of disease occur in the animal (e.g., CAE, Johne's disease). Producers may not notice slight increases in the level of disease until a large part of the herd is infected. Using CAE arthritis as an example, if the level of lameness due to CAE increases slightly year-over-year, the proportion of animals infected with the virus may have gone up much more than that, particularly in youngstock, putting them at high risk of developing incurable arthritis in 3–5 years.

Control of chronic disease is most effective when done to prevent initial infection as most of these diseases cannot be cured, which means that it may take several years to see a positive effect from those measures. For this reason, it is important to closely monitor the level of chronic disease in the herd.

What constitutes an appropriate level varies with the disease (see Table 6.2), but ultimately the goal is to prevent goats from suffering from diseases that cause pain, poor welfare, and premature culling or euthanasia. A disease prevention and control strategy can be created in collaboration with your herd veterinarian.

There are 2 main approaches to controlling infectious diseases:

a. the first is eradicating the disease from a farm through programs that use enhanced biosecurity and disease testing
b. the second is prevention and control (i.e., managing the disease to minimize impacts on health and welfare through measures such as proactive monitoring of levels of disease, biosecurity, vaccination, prophylactic treatments [e.g., deworming], and culling infected animals that cannot be cured).

Table 6.2 and *Appendix L – Important and Serious Infectious Diseases of Goats: Signs and Causes* include some of the more common diseases that negatively impact goat welfare in Canada and signs associated with those diseases. These diseases may affect a particular management group (e.g., kid group) or the herd. To control or prevent these diseases, a herd health plan should be developed with guidance from the herd veterinarian as well as other experts to minimize disease.

REQUIREMENTS

If there are unexpected, unexplained, or sudden increases in illness or death losses within the herd, an investigation followed by corrective action must be taken.

The herd veterinarian must be consulted if investigation and/or corrective action taken fails.

RECOMMENDED PRACTICES

a. given the harmful effects of chronic diseases (e.g., CAE, Johne's disease) on goat health, welfare, and production, a prevention and control program should be implemented to reduce the spread of disease within a herd. When considered feasible, eradication of a disease should be considered
b. develop recommended measures to control and prevent diseases in consultation with the herd veterinarian, and include disease testing, culling, prophylactic treatments, vaccination, and improved biosecurity, as well as other measures depending on the disease
c. review disease prevention and control programs annually and make changes in collaboration with the herd veterinarian
d. perform or have postmortems performed when there are unexpected, unexplained, or sudden increases in death losses
e. monitor the herd regularly for infectious disease using appropriate diagnostic tests.

Table 6.2 – Important and Serious Infectious Diseases of Goats

Clinical Signs of Infectious Disease	Level When Considered Serious
Pregnant does: Late term abortions, stillbirths, and weak newborn kids.	When exceeds 5% of pregnancies; often may be 20% to 40% over a short period of time.
Newborn and nursing kids: Septicemia causing severe depression, joint ill, neurological signs, and death in young kids.	The proportion of kids affected can be high and should not be greater than 5% of kids born alive. Most kids die or need to be euthanized.
Nursing kids in first 2 to 3 weeks of life: Bacterial, viral, or protozoal pathogens causing diarrhea, depression, and dehydration.	The number of cases can be high and should not be greater than 5% of kids. The level tends to rise very quickly in the group.
Nursing and weaned kids 3 weeks to 6 months of age: Coccidiosis causing diarrhea, dysentery (bloody diarrhea), and poor growth.	Most often the entire group is affected with reduced growth, although severe disease may only be apparent in a proportion (5 to 10%).
Any age, more common in youngstock: Pneumonia. Fever, depressed, coughing, off-feed, nasal discharge, difficulty breathing.	Acutely this can affect > 20% of the group, particularly youngstock. May also see acute death. Chronic pneumonia is common where treatment failed or was not provided in time.
Any age: Enterotoxaemia. Severe diarrhea, dysentery, and dehydration in adults and older kids.	May see outbreaks of losses (5 to 10% or greater) or a high level of new cases over time (e.g., 2–3 per month). Case fatality rate is high (close to 100% in kids and 10–30% in adults).

Table 6.2 – Important and Serious Infectious Diseases of Goats (continued)

Clinical Signs of Infectious Disease	Level When Considered Serious
Any age: Gastrointestinal parasitism. Seen in grazing goats of any age. Anaemia, diarrhea, edema (e.g., bottle jaw, abdominal), poor growth. If severe enough, causes sudden death. Signs may also appear while still housed around kidding time due to infection picked up the previous grazing season.	The level of gastrointestinal parasitism in grazing goats can quickly change from no evidence of illness, to > 5% showing severe signs of disease, with a higher proportion subclinically affected. Sudden death may also occur if animals are not routinely monitored for level of parasitism.
Any age: Neurological diseases. Signs include paralysis of the hind end or face, unable to swallow, circling, convulsions, blindness.	Depending on the cause, the number of cases over time may be high or outbreaks of disease may be seen.
Lactating and dry does: Clinical mastitis. Swollen udder, abnormal milk, reduced milk production. Occasionally will see high fever, gangrene of the udder, and death losses of up to 50% of cases.	While severe cases may not be common (1–2% per year), cases of clinical mastitis > 10% of the herd should be investigated. Severe mastitis in meat goats is mostly seen at kidding, weaning, or in peak lactation (3–6 weeks post-kidding).
Adult goats, usually > 3 years of age. CAE (Caprine Arthritis Encephalitis). Arthritis of joints causing lameness, poor milk production, and hard udder without other signs of mastitis. Rarely neurological signs. There is no treatment.	Animals with signs of disease are only the tip of the iceberg with many more animals affected. The level of clinically affected animals should not exceed 5%.
Adult goats, as young as 1 year of age but most commonly > 3 years of age. Johne's disease. Affected goats will lose condition over 2 to 6 weeks, to the point of severe wasting, weakness, and death. Occasionally they may develop terminal diarrhea. There is no treatment.	Animals with signs of disease are only the tip of the iceberg with many more animals affected. Serious when the level of clinically affected animals exceeds 5%.

Refer to *Appendix L – Important and Serious Infectious Diseases of Goats: Signs and Causes* for a further detailed table including possible causes.

7 Transport

Desired Outcome: To ensure, through proper preparation, that goats being transported experience the least possible stress without pain and unnecessary suffering and arrive at their destination in good health and condition.

Transport is a stressful experience for goats (96). Even when done with care, mixing of groups, time off feed and water, unfamiliar environments, and weather can all negatively impact goats. It is important to make transport as stress-free as possible.

Each person involved in various stages of goat transport in Canada has a role in ensuring that the transport process (including loading, transport, and unloading) does not cause injury, suffering, or death of the animals (106, 107). This includes anyone who handles, loads, and unloads goats (e.g., buyers and sellers of goats, stockpeople, drivers), and anyone else involved in shipping goats.

The federal requirements for animal transport are covered under the *Health of Animals Regulations* (HAR) – Part XII (3, 97). The maximum intervals for feed, water, and rest withdrawal are captured within Part XII as well as in *Appendix M – Transport Decision Tree*. The Canadian Food Inspection Agency (CFIA) enforces them with the assistance of other federal, provincial, and territorial authorities. Some provinces also have additional regulations related to animal transport. If you do not comply with the regulations, you may be fined or prosecuted. If your actions or neglect are considered animal abuse, you could also be charged and convicted under the *Criminal Code of Canada* and/or provincial regulations. **This Code is not a comprehensive resource for the applicable provincial and federal regulations; they must be reviewed in their entirety.**

The transport process begins with the decision to ship an animal. The producer is responsible for ensuring animals are fit for transport, selecting the mode of transport if transporting the animals themselves, or otherwise selecting a transporter, and removing feed and water prior to transport while ensuring they follow Canada's animal transport requirements.

The scope of the goat Code of Practice ends at the farm gate but includes Requirements and considerations that affect the transport process. To avoid duplication, the current *Recommended Code of Practice for the Care and Handling of Farm Animals: Transportation* should be used as a reference document for the actual transport process (98).

7.1 Pre-Transport Decision Making

It is the responsibility of the party that is shipping, or causing to load, the animals to ensure that all animals are fit for the intended journey (3, 97). Those responsible for arranging transport need to be aware of how long the animals may be in transit. If unknown, assume the longest travel period that may occur (e.g., animals sent for slaughter may be in the marketing chain for multiple days prior to reaching an abattoir). If you are unsure whether an animal is fit for the intended journey, check with your veterinarian or consider mobile abattoir or on-farm slaughter options.

The transport process, or continuum, involves all aspects of transport-related activities that animals experience and begins when feed and water are withdrawn (or last provided, for example with kids on milk when they received their last milk meal), and when access to rest is no longer available (3). It includes mustering (assembly) for loading, loading, and confinement during the pre-transport, transport, and post-unloading periods. It also includes the time leading up to when the animal is provided with access to feed, water, and rest after it has been unloaded. Those arranging shipping will also need to know whether additional services (e.g., feed, water, rest, milking) during transit are needed.

Proactive euthanasia or treatment decisions must be made on-farm so animals are not loaded if they are not fit for transport. Having predetermined criteria for culling animals from the herd (refer to *Section 6.1.2 – Managing Sick, Injured, or Cull Animals*) is key to marketing goats while they are still fit to ship. Goats that are not fit to ship must be treated or euthanized (refer to *Section 8 – Euthanasia and On-Farm Slaughter* and *Appendix J – Example of Decision Tree for Euthanasia*).

Assembly centres (e.g., auction markets, collection stations) are not considered final destinations (3, 97). Animals shipped off farm may travel through multiple stops, possibly for days, before reaching a slaughter plant or final destination. Producers need to consider, as part of the fitness assessment for transport, where the final destination may be and when goats will arrive there.

Fitness for Transport

Animals that are to be shipped must be deemed fit for the intended transport (3, 98, 99). Fit animals are those in good health that are expected to reach their destination in the same condition. Animals not considered to be fit are either "compromised" or "unfit." These terms are not interchangeable:

a. a **fit animal** is one that is deemed to be able to withstand the stress of the intended journey and can be transported without suffering
b. a **compromised animal**, generally, is one with a condition that impairs its ability to tolerate transport. However, with special provisions, it can be transported short distances to the nearest place (not an assembly centre), where it can receive care or be humanely killed without causing unnecessary suffering (refer to *Appendix M – Transport Decision Tree*)
c. an **unfit animal** is an animal that is likely to suffer during transport (or continued transport if they become unfit after transport begins). Unfit animals cannot be loaded or transported unless going directly on the advice of a veterinarian for veterinary care to be provided (such as an animal requiring setting and casting of a fractured limb, animal requiring a caesarian section), and with special provisions. This includes non-ambulatory animals or animals likely to become non-ambulatory. "Non-ambulatory" means unable or unwilling to rise, stand, or walk unassisted or unable to move without being dragged or carried (refer to *Appendix M – Transport Decision Tree*).

For animals that cannot be transported in their current state, transport must be delayed, and either appropriate health intervention provided until the animal is fit for the trip, or the animal is euthanized (refer to *Section 8 – Euthanasia and On-farm Slaughter*).

Each person involved in shipping an animal must assess and be sure each animal is fit to withstand the intended journey. Shipping compromised animals should not be routine. Aim to always ship fit, healthy animals, and work with your veterinarian to refine culling criteria to allow for early identification of cull animals. If there is any doubt about an animal's fitness for transport, consult a veterinarian.

REQUIREMENTS

Persons handling or transporting goats must comply with Part XII of the Health of Animals Regulations (3, 97) and applicable provincial regulations.

The fitness for transport of every animal must be evaluated within the context of each trip or journey (refer to* Appendix M – Transport Decision Tree*).

Only healthy, fit animals without injury or illness can be shipped to assembly centres, breeding stock sales, or livestock sales.

Compromised animals must not be sent to assembly centres (e.g., livestock auction markets or collection yards) and if transported for slaughter must go directly to the closest provincial or federal abattoir.

Unfit animals must not be transported except for veterinary care on the advice of a veterinarian.

RECOMMENDED PRACTICES

a. have in place criteria for culling that facilitates marketing of cull animals from the herd while they are fit
b. clearly identify and provide documentation for animals showing signs of an infirmity/current health condition at time of loading if transporting for care (e.g., a veterinary note explaining the condition and treatment given, video on smartphone)
c. ship animals direct to slaughter with conditions that could be considered contagious (e.g., positive for Johne's disease or CAE), if otherwise compliant with federal and provincial regulations.

7.2 Pre-Transport Preparation

Advance planning is a key factor affecting the welfare of animals during transport. Those responsible for arranging transport need to know how long the goats are expected to be in transit, including intermediate stops (e.g., auction markets, feed/water/rest stops), the type of livestock conveyance being used (e.g., cattle liner, pots, stock trailer), and whether the transporter needs to provide additional services (e.g., feed appropriate for the age/stage of production, water, rest) during transit (3, 97, 98, 99, 100). Risk factors need to be assessed prior to transport and include, but are not limited to:

- animal compatibility
- vulnerable animals
  - such as those lactating (require being milked at intervals to prevent udder engorgement), those that are heavily pregnant, compromised, young ruminants too young to be fed exclusively on hay and grain, and very young animals (e.g., less than 15 days of age)
- hot and humid weather
- cold weather
- wind-chill
- traffic congestion.

REQUIREMENTS

<u>Pre-Trip Planning</u>

People arranging transport must ensure that locations receiving goats are expecting them and are equipped with personnel and facilities required to meet the animals' needs upon arrival.

The potential duration of a journey, including stops prior to the final destination, must be considered when evaluating fitness for transport.

Nursing kids accompanying their dams must be allowed an opportunity to nurse undisturbed at suitable intervals while waiting for loading, after loading, and during transport.

<u>Must Not Transport</u>

Animals believed or suspected of being in late gestation (i.e., expected to give birth within 15 days) must not be transported (unless for short distances within farm limits to kidding area with veterinary recommendation and oversight).

Animals must not be shipped within 48 hours after giving birth except under the advice of a veterinarian.

Kids 8 days of age or less must not be transported to assembly centres (e.g., livestock auction markets).

REQUIREMENTS (continued)

Pre-Loading

The required assessment of animal fitness and records (e.g., livestock manifests, emergency contact information, date/time of last fed/watered/rested) must be completed and provided to the transporter in advance of loading the goats (97).

Risk factors regarding the animals and the conditions of transport prior to loading must be assessed to prevent animal injury, suffering, or death.

Conveyances must be free of animal by-products such as manure, urine, or soiled bedding prior to loading.

Suitable bedding (e.g., straw, wood shavings, peat moss) must be added to conveyances to assist in absorbing urine and to protect the animals during transport.

Animals must have at least 1 cm (or 2 weeks for fibre producing goats) hair growth to be transported during the cold season unless alternative protection such as coats or heated transport is used.

Compromised animals must be transported with special provisions (such as being isolated, individually loaded/unloaded without having to negotiate ramps inside the conveyance, extra bedding).

Goats must be separated if they are incompatible by reason of breeding season, sourcing, temperament, sex, weight, age, or horned or health status (with the exception of female animals and their nursing offspring).

RECOMMENDED PRACTICES

a. clean and disinfect conveyances after each use using national biosecurity standards and biosecurity principles
b. a system for early identification of compromised or unfit animals prior to loading, and an appropriate plan for handling them, should be in place and known to all stockpeople
c. avoid shipping does in their last trimester (e.g., last 50 days)
d. schedule loading to avoid congested traffic conditions and/or long-distance transport in extreme weather conditions (e.g., evening or early morning in hot/humid weather, delaying in extremely cold conditions) and so that animals can be unloaded promptly at destination
e. avoid transporting kids before 15 days of age. Kids that are not weaned (i.e., nursing) should be shipped with special precautions as they may not be able to withstand the same conditions as adult goats. It is recommended they be sent directly to buyers rather than shipped through assembly yards or auctions.

7.3 Arranging Transport

It is essential that those involved in arranging transport for or loading/unloading (or causing to load/unload) goats (e.g., producers, transporter, farm hands, processing facility staff) have experience transporting goats and are knowledgeable of goat behaviour and care, and that animals to be transported are fit to withstand the entire journey (3, 97). Those producers/employers who have staff are responsible to ensure that the people they hire for transporting animals are trained and competent.

REQUIREMENTS

Goats must be transported by competent personnel using safe, well-maintained conveyances and equipment.

Conveyances and containers used to transport goats must be in compliance with federal and provincial regulatory requirements.

Containers, if used, must be secured to conveyances to prevent movement during transit.

Conveyances and containers must be constructed to provide goats with adequate ventilation at all times.

Ventilation and air temperature within the conveyances must be adjusted to meet the animals' needs.

Goats must be protected from snow, rain, frostbite, and loss of body heat during transport.

Goats must be protected from direct contact with the conveyance's cold metal surfaces by lining the floor with dry bedding or other suitable insulating material while ensuring adequate ventilation.

RECOMMENDED PRACTICES

a. select reputable transporters:
   - when using a new transporter, ask for a list of references who have used them to transport goats
   - ensure that the transporter has appropriate experience to address specific needs (e.g., short vs. long distance hauls)
   - inquire about training for their drivers in the care, handling, and transport of animals

b. review training with staff annually, or more frequently (as needed), in handling, loading, and unloading goats

c. ensure loading facilities are compatible with the type of trailer being used by the transporter

d. parked conveyances should be parked where there will be relief from the heat (e.g., shaded area) or additional cooling methods utilized

e. add weather boards (adjustable) on the outside of a vehicle to allow for repositioning without having to enter the vehicle to protect during extreme temperatures until conditions improve.

7.4 Loading and Receiving On-Farm

Properly designed handling systems and loading ramps help to improve the ease of loading and reduce stress and the chance of injury during loading or unloading (96). People involved with loading and unloading should have sound knowledge of goat behaviour and understand how those natural behaviours can be used to assist the low-stress loading/unloading process.

The transporter will have knowledge of allowable weight and loading/stocking densities on each part of the trailer and can adjust densities to current weather conditions and weight restrictions (69). Transporters are also aware of variations between provincial/state requirements.

General principles of good goat handling apply to the loading and unloading of goats (refer to *Section 5.1 – Handling*). Their use will reduce stress and injury for both stockpeople and goats. Persons handling or transporting goats must comply with Part XII of the *Health of Animals Regulations* and applicable provincial regulations.

Goats have important behavioural characteristics which must be taken into consideration when they are being moved (69). In particular, they are gregarious animals and should be in the company of compatible

animals while in transit (isolation is a stressful event). Refer to *Section 6.1.2 – Managing Sick, Injured or Cull Animals* for more information.

REQUIREMENTS

Handling

All Requirements in the Handling section (refer to* Section 5 – Husbandry Practices*) of this Code must be applied.

Instances of inhumane handling or transport must be documented and immediately reported to proper authorities (e.g., Provincial Animal Welfare Authority, local CFIA).

The right of the transporter to refuse to load goats that they deem unfit for transport must be respected. The reason for refusal must be addressed.

Personnel in charge of transporting goats must demonstrate knowledge and competence in low stress handling of goats when loading, unloading, and while in transit.

Goats must be loaded calmly, quietly, and patiently using equipment suitable for goats.

Equipment and Loading

Trucks must be in good repair, clean, and adequately bedded.

Ramps used for loading/unloading must be able to bear the weight of the animals, have side barriers that inhibit jumping, have secure footing, be placed with no gap between the ramp and vehicle, and have a slope that does not exceed 35 degrees.

Goats must be able to stand at all times with all feet on the floor, head elevated with sufficient space to permit a full range of head movement, and without any part of its body coming into contact with a deck, roof, or top of the conveyance or container.

When loading, goats must have a clear path to move forward, and not be rushed or overcrowded (consider the appropriate loading densities and the factors that influence densities such as weather, hair length, horns, length of journey).

Special measures must be taken when transporting does in peak lactation.[1] They must be transported with their young or milked in a manner and frequency that prevents udder engorgement (e.g., goats in high lactation sold for culling in an assembly center must be dried off).

Care upon Arrival

If euthanasia is required, goats must not be dragged from the conveyance while conscious: they must be humanely stunned or euthanized without being removed from the conveyance and confirmed unconscious before unloading. Actions to assure death after removal from the conveyance must be taken (refer to* Section 8 – Euthanasia and On-Farm Slaughter*).

Goats must be provided feed, water, and rest immediately upon arrival (refer to* Section 4 – Feed and Water*).

Prompt additional care must be provided to goats showing signs of heat or cold stress, illness, or injury on arrival (Table 7.1).

[1] CFIA infographic *Transport of lactating animals* www.inspection.canada.ca/animal-health/humane-transport/transport-of-lactating-animals/eng/1643140920906/1643140921812.

RECOMMENDED PRACTICES

a. ensure loading areas and transport containers/trailers are well lit (without a drastic change in lighting) to help encourage goats to enter
b. ensure loading area has non-slip flooring (secure footing), is uniform in appearance to prevent balking, and is well drained and free from ice
c. move goats in groups appropriately sized for the compartments on the conveyance
d. when the conveyance is not full, goats should be safely partitioned into smaller areas to prevent excessive movement of the goats and to provide stability to the conveyance
e. ensure that the loading area promotes smooth flow of goats on or off the conveyance. Avoid significant changes in floor height or distractions
f. make improvements to handling methods, management, and/or facilities if goats are observed falling during loading or unloading
g. goats waiting for loading or waiting for further actions after unloading should have access to well drained areas and protection from adverse conditions
h. check each load immediately before departure to ensure that the goats have been properly loaded and are assessed as ready for the intended transport.

Table 7.1 – Signs of Animal Discomfort during Transport

Problem	**Warning Signs**
Overcrowding	Load will not "settle"; animals continue to scramble for footing and the load continues to be noisy for prolonged periods of time. Animals involuntarily lie down and may be unable to get up.
Overheating	All species will pant when overheated; animals standing with neck extended with open mouthed breathing is a dangerous situation and requires immediate intervention.
Cold exposure	Moisture frozen to the face, hair or nostrils. Shivering, dull or hunched appearance.

Source: Canadian Agri-Food Research Council (CARC) (2001) Recommended Code of Practice for the Care and Handling of Farm Animals – Transportation. *Available at: www.nfacc.ca/codes-of-practice/transport*.

8 Euthanasia and On-Farm Slaughter

Desired Outcome: When necessary, goats are euthanized or slaughtered promptly and with minimal pain and distress.

Euthanasia is necessary when care to alleviate pain and suffering is provided but the animal is not responding, treatment is not feasible, or there is no reasonable prospect for recovery. Euthanasia may also be necessary to ensure human health or safety and/or regulatory requirements associated with disease control.

Allowing a sick or injured animal to suffer unnecessarily is unacceptable. Veterinarians can assist stockpeople in making treatment and euthanasia decisions. Once a euthanasia decision is made, euthanasia must be carried out by competent personnel without delay, using an acceptable method that incorporates correct landmarks for the chosen method and secondary steps when using captive bolt (refer to *Appendix N – Anatomical Landmarks for Euthanasia* and *Appendix O – Secondary Steps to Cause Death*).

Veterinarians play an important role in developing Euthanasia Action Plans, providing training, and performing euthanasia.

8.1 On-Farm Euthanasia Plans

Having a written and communicated euthanasia action plan will help ensure that euthanasia is carried out in a timely, effective, and consistent manner and that the immediate alleviation of pain and suffering is addressed (refer to *Appendix J – Example of Decision Tree for Euthanasia* and *Appendix P – Sample On-Farm Euthanasia Action Plan*).

If the stockperson providing care to the animal is unable to perform euthanasia, the herd veterinarian or another trained person can provide these services.

Once the decision has been made to euthanize, the procedure should be performed without delay. If euthanasia cannot happen immediately (e.g., trained stockpeople or equipment not immediately available), producers should take steps to prevent future delays such as training additional people or purchasing additional equipment.

REQUIREMENTS

Every farm must (i) identify which approved methods of euthanasia they use (including correct landmarks and techniques; refer to Table 8.1) and (ii) review this with the herd veterinarian.

All farms where euthanasia is performed by anyone other than the owner/primary producer must have a written Euthanasia Action Plan that indicates appropriate methods, landmarks, and secondary steps when using a captive bolt.

Personnel performing or supervising euthanasia must have been trained by a competent person on how to appropriately handle and euthanize goats humanely.

Every farm must always have at least one person available who is responsible for making euthanasia decisions.

Personnel and euthanasia equipment must be available at all times such that an animal can be euthanized without delay to prevent unnecessary pain and suffering.

REQUIREMENTS (continued)

A decision to euthanize a goat must be made immediately when an animal is ill or injured and suffering pain or distress and:

- ***the animal has no reasonable prospect of recovery, or***
- ***treatment cannot or will not be provided, or***
- ***the animal has been treated but the expected response to treatment has not occurred and further treatment is not warranted.***

If there is any doubt as to how to proceed, a veterinarian must be consulted at an early stage to advise whether treatment is possible or whether euthanasia is required to prevent suffering.

RECOMMENDED PRACTICES

a. all farms should develop a written Euthanasia Action Plan that indicates the appropriate method(s) of euthanasia for each size of goat (a euthanasia action plan template can be found in *Appendix P – Sample On-Farm Euthanasia Action Plan*)
b. the Euthanasia Action Plan should include who will be responsible for making the decision to euthanize, how euthanasia will be done, and who will perform the task
c. when developing a farm-specific Euthanasia Action Plan, it should be done in consultation with the herd veterinarian
d. participate in a training session with a veterinarian. Training should include anatomical euthanasia landmarks, methods and required secondary steps, assessing loss of consciousness, signs of returning to sensibility, and confirming death
e. review training materials and the Euthanasia Action Plan at least annually, and more frequently as needed
f. develop a farm-specific protocol for determining when a goat should be euthanized. This protocol should be easily shared with all stockpeople involved in the care of the goats.

8.2 Acceptable Methods of Euthanasia

Euthanasia must be rapid, causing minimal to no stress and pain, and result in immediate loss of consciousness followed by death without the animal regaining consciousness. Humane handling and restraint (refer to *Section 5.1 – Handling*) are also important components of euthanasia.

When choosing a euthanasia method (refer to *Table 8.1 – Acceptable Methods of Euthanasia and Secondary Steps*), consider:

- 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
- 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.

When euthanizing a pregnant doe, leaving a fetus(es) within the dam ensures that it will also die. When fetuses are viable and the intent is to save them, the best approach is to perform a caesarian section using standard anaesthetic and surgical procedures before euthanizing the dam. Nonviable kids should be euthanized immediately using an approved method (101).

The only acceptable methods are listed in Table 8.1. Appendices N and Q provide important further guidelines. Research has demonstrated that these methods all minimize or eliminate pain and distress.

Manually applied blunt force trauma is not an acceptable method for euthanizing goats as it is difficult to apply consistently and effectively, even in young kids (101).

Table 8.1 – Acceptable Methods of Euthanasia and Secondary Steps*

Method	Suitable for	Equipment and procedure
Firearm	All weight and age classes	Firearm calibre and bullet must be appropriate to the size of the animal. Safely restrain the animal's head, as necessary, to successfully aim at landmarks. Firearms must never be placed directly against the animal's head, but 10–30.5 cm (4–12 inches) away. Refer to *Appendix Q – Acceptable Calibres and Cartridges for Euthanasia of Goats* and *Appendix N – Anatomical Landmarks for Euthanasia.*
Penetrating captive bolt and secondary step*	All weight and age classes	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. Refer to *Appendix N – Anatomical Landmarks for Euthanasia* and *Appendix O – Secondary Steps to Cause Death.*
Non-penetrating (concussive) captive bolt and secondary step*	Kids under 5 kg body weight and less than 48 hours of age	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 against the head. A secondary step is required. Refer to *Appendix N – Anatomical Landmarks for Euthanasia* and *Appendix O – Secondary Steps to Cause Death.*
Drugs approved for euthanasia (e.g., barbiturates)	All weight and age classes	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.

***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 herd 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.

Refer to *Appendix O – Secondary Steps to Cause Death.*

REQUIREMENTS

An acceptable method of euthanasia must be used (refer to* Table 8.1 – Methods of Euthanasia and Secondary Steps *and* Appendix N – Anatomical Landmarks for Euthanasia*).

Methods not listed in Table 8.1 are unacceptable.

***Placement of firearm or captive bolt must be according to* Appendix N – Anatomical Landmarks for Euthanasia.**

Manually applied blunt force trauma is not an approved method of euthanasia for goats of any age or size and must not be used.

The selected euthanasia method must take into consideration the age and size of the goat to be euthanized, as well as the availability of proper equipment, appropriate restraint, and the comfort level and training of the person performing the procedure.

Before being euthanized, animals must not be dragged, prodded, or made to move if pain or suffering may occur.

The safest, least stressful method of restraint must be used.

Equipment necessary for euthanasia, such as firearms or captive bolt devices, must be used, stored, and maintained according to the manufacturer's instructions to ensure proper function.

RECOMMENDED PRACTICES

a. consider, in consultation with the herd veterinarian, sedation as a means of humane restraint as part of the euthanasia protocol
b. work with the herd veterinarian on selecting the appropriate captive bolt device, cartridge, charge, and bolt length for goats on your farm
c. do not manually restrain adult goats for euthanasia when using a firearm or captive penetrating or non-penetrating bolt device for euthanasia. Tools such as halters or head gates are better to assure human safety.

8.3 Confirmation of Loss of Consciousness and Death

When goats are euthanized, death does not occur immediately; it is the result of respiratory and cardiac failure and can take several minutes. Goats being euthanized must be rendered unconscious immediately and remain unconscious until death occurs. When the animal is unconscious, it cannot feel pain or experience distress (101).

An unconscious animal may have involuntary movements (e.g., paddling or kicking of the legs, neck flexing). When successfully stunned, the muscles are soon limp; the corneal reflex is absent (no blink response when the eyeball [i.e., the cornea] is touched); there is no vocalization, head lifting, or attempts to rise; and rhythmic breathing has ceased, with the possible exception of an occasional agonal breath (sudden gasp). Animals euthanized by a firearm or captive bolt device should immediately collapse upon the application of the euthanasia method as a further indicator of unconsciousness. Death is confirmed by a cessation of respiration and heartbeat for several minutes (33, 101).

The heartbeat is best monitored using a stethoscope placed over the location of the heart on the left side of the chest wall, just under the elbow. A low-cost stethoscope is sufficient for this purpose. Other less effective ways are to feel for the heartbeat or place an ear against the chest wall over the location of the heart. Feeling for a pulse elsewhere on the body is least effective and may miss a weak but present heartbeat.

The use of a strong flashlight can make checking the animal for fixed and dilated pupils easier when in an area of low ambient light. There should be no constriction of the pupil when a strong light is shone into the eye.

REQUIREMENTS

Goats must be assessed for loss of consciousness immediately after stunning. A goat is considered unconscious when there is:

- ***a lack of rhythmic breathing***
- ***no blink response when the eyeball is touched (corneal reflex)***
- ***a lack of vocalization***
- ***the animal does not attempt to rise to its feet or lift its head.***

If any sign of consciousness is observed, animals being euthanized by a firearm or captive bolt device must be shot again immediately.

Before moving or leaving the animal, monitor to confirm death 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 after loss of consciousness the animal must be shot again, or a secondary step repeated.

Re-check indicators of death 5 minutes after heartbeat and respiration have ceased to ensure euthanasia was successful.

Carcass disposal must be in accordance with applicable regulations.

RECOMMENDED PRACTICES

a. actively monitor heartbeat and respiration for a full 5 minutes after applying the euthanasia method
b. use a stethoscope to monitor heartbeat
c. discuss the normal process of dying (i.e., typical signs of impending death) including how to ensure death has occurred, so observers understand what to expect. The herd veterinarian can provide this information.

8.4 Mental Well-being

Not all people will be comfortable making euthanasia decisions or performing euthanasia. It is important to respect the aspects of mental stress associated with these tasks. For these reasons, a euthanasia plan should consider the mental well-being of the stockpeople (102).

RECOMMENDED PRACTICES

a. discuss euthanasia decision making and the process of euthanasia with stockpeople to ensure that they understand and accept these duties
b. do not require an animal care provider who has expressed that they are unwilling to accept these duties to perform euthanasia or make euthanasia decisions
c. make changes to the euthanasia plan if those responsible for performing euthanasia are observed to be experiencing changes in their mental wellness.

8.5 On-Farm Slaughter

Captive bolt devices and firearms 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 a humane method of slaughter.

Producers must ensure all applicable regulations are followed if slaughtering on the farm. It should be noted that on-farm slaughter for other than own use is prohibited by law in some jurisdictions in Canada.

REQUIREMENTS

All applicable regulations and guidance must be followed if slaughtering on-farm.

Persons performing or supervising on-farm slaughter must have the relevant knowledge, experience, and skills to slaughter the goat humanely.

***Goats must be monitored for loss of consciousness and death as in* Section 8.3 – Confirmation of Loss of Consciousness and Death.**

Death must be confirmed before any dressing procedures are conducted.

Inverting or hanging goats while they are conscious is prohibited.

8.5.1 Slaughter Without Stunning

Pre-slaughter stunning can only be omitted for specific ritual slaughter in accordance with religious rules (Islamic or Judaic requirements). An unconscious animal is preferred to minimize pain and distress throughout the slaughter process.

Ritual bleeding can result in rapid, but not instantaneous, loss of consciousness. If slaughter must be done without stunning, the best practice for the welfare of animals is to stun the animal immediately following the cut (post–cut stunning).

There are considerable welfare risks associated with slaughter without stunning because it results in distress, pain, and potential aspiration of blood. **For this reason, slaughter without stunning is not considered euthanasia.**

It is recommended that if non-stun slaughter is to be done, the goats are sent to a licensed abattoir with personnel trained and equipped to do this method and with appropriate oversight, handling systems, equipment, and monitoring.

REQUIREMENTS

All applicable regulations and guidance must be followed if slaughtering without stunning on-farm.

Persons performing or supervising on-farm slaughter without stunning must have the relevant knowledge, experience, and skills to perform the ritual cut correctly to achieve death as rapidly as possible.

If performing on-farm slaughter without stunning, a standard operating procedure for slaughter without stunning must be included in the euthanasia action plan of the farm (refer to* Appendix P – Sample On-Farm Euthanasia Action Plan*).

Requirements from Council of Chief Veterinary Officers "Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning" must be followed (refer to* Appendix R – Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning*).

RECOMMENDED PRACTICES

a. slaughter without stunning should be performed within properly equipped slaughtering facilities when possible
b. it is strongly recommended that animals that are slaughtered without stunning be immediately stunned post-cut using captive bolt or firearm to reduce the potential for animal suffering
c. recommendations from the Council of Chief Veterinary Officers "Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning" are strongly encouraged (refer to *Appendix R – Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning*).

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Sample Goat Welfare Policy

[Your Farm/Company]

Employee Animal Care Code of Conduct

Our commitment to our animals

[Our company/farm] is committed to responsible farm animal care and handling. That means animals in our care deserve to be healthy, safe and well cared for.

Our commitment to our customers

Working with animals is important work that we take seriously. We are proud of the work that we do, and we strictly enforce responsible farm animal care and handling among employees and service providers at our facility.

Every person who handles or comes into contact with an animal is required to support our core objective of responsible farm animal care and handling. The demonstration of that support is through the review and signing of this Code of Conduct agreement on a **[quarterly/annual]** basis.

Our commitment to our employees

Your job is valuable and important to our animals, and our business. When you report an incident involving possible mistreatment, illness or injury involving one of our animals, we will take it seriously. We will document your concern. We will follow up to resolve the animal's situation, and/or provide additional training among employees.

Our employees' commitment to us

Every one of our employees is required to handle and treat animals with respect and in accordance with **[farm/company]** policies and rules as well as the federal, provincial, and municipal regulations under which we operate.

Any employee who is responsible for, observes or receives any information that alleges an animal on our property or in our care is being mistreated, mishandled or treated or handled in a way that is contrary to our animal care policy/guidelines must report that information to **[NAME OF POINT PERSON]** immediately so that the situation can be corrected. **[PROVIDE CONTACT INFO]**.

Failure to adhere to this agreement is cause for dismissal. **[Farm/company]** reserves the right to refer animal-abusers to law enforcement for prosecution.

I _____ understand and acknowledge that willful neglect, mishandling or abuse of animals by any [name of company] employee or witnessing it and not reporting it is subject to discipline including immediate termination of employment, and that offenders may also be subject to prosecution under applicable laws.

_____ _____

Signature of employee Date

Print name: _____

_____ _____

Signature of employer Date

Name and Title: _____

Source: Adapted from the Code of Practice for the Care and Handling of Veal Cattle *(2017). Available at www.nfacc.ca/codes-of-practice/veal-cattle.*

Emergency Telephone List

People to Contact in Case of Emergency	Phone Number	Emergency Phone Number
Owner/manager		
Veterinary clinic		
Police		
Fire department		
Electrical company		
Poison control centre		
Company performing maintenance and repair of ventilation and heating systems		
Company performing maintenance and repair of the gas heating system		
Company repairing the watering system(s)		
Company performing maintenance and repair of the feeding system(s)		
Plumber (water outage or broken pipe)		
Electrician		
Alarm system company		
Feed supplier		
Milking system maintenance company		

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).

Assessing Farm Buildings for Fire Prevention

Use the checklist to identify fire risk in farm buildings.

Structure		Yes	No
1	The largest, separate fire compartment size is less than 4,800 m^2 (51,672 ft^2)?		
2	Buildings are located at least 30 m (100 ft) from each other or have properly constructed (minimum fire-resistance rating of 1 hour) fire rated walls separating the individual fire compartments?		
3	Properly constructed fire stops exist in the attic at 30 m (100 ft) intervals?		
4	No unsealed gaps or passageways in attic fire stops?		
5	Interior sheathing materials have low Flame Spread Ratings and Smoke Developed Classifications?		
Electrical System			
6	Electrical inspection completed within the past year?		
7	Thermographic inspection of the entire electrical system, completed when the barn is at its peak electrical demand, completed within the past year?		
8	Any wiring passing through concealed spaces is enclosed in conduit?		
9	All electrical connections are hard wired (no extension cords)?		
10	An electrical/mechanical room contains components, including the main electrical panel, and is separated from the livestock air space with properly constructed fire rated walls (1 hour minimum)?		
11	All electrical equipment used in the barn displays a Canadian electrical approval stamp (e.g., CSA, ULC)?		
12	Animals are kept from direct access to electrical wiring. Outlets should be above animal head height or where they can not be reached?		
13	Electrical fixtures are properly protected and mounted?		
14	Fan motors are totally enclosed?		
15	Crop dryers are equipped with adequate controls that will automatically shut off blowers or dampers when temperatures get too high?		
Heating System			
16	Open flame box heaters or radiant tube heaters (that draw combustion air or exhausts directly into the barn space) are not used in a barn where methane gas can accumulate in significant concentrations?		
17	Sufficient space exists between all heating appliances and combustible building features (minimum clearance requirements maintained)?		
18	Heat shields for all heaters are in place (if required)?		
19	Maintenance checks of all heating devices have been completed as per the manufacturer's recommendations (minimum once per year)?		

Assessing Farm Buildings for Fire Prevention (continued)

	Heating System (continued)	Yes	No
20	Bollards are used to protect propane and liquid fuel tanks and gas valves from vehicle impact?		
21	Animals are kept from direct access to heat sources?		
	Stored Products		
22	Less than a two-day supply of hay, straw, sawdust, feed, or similar products are stored within barn?		
23	Separate buildings are used to store larger quantities of hay, straw, sawdust, feed, or similar products?		
24	Buildings are separated by a minimum distance of 30 m (100 ft) or by using a fire separation with a minimum rating of 1 hour (i.e., providing exterior walls)?		
25	Clutter and combustible products are removed from the barn on a regular basis?		
26	Flammables (e.g., diesel, gas, propane) are stored in approved containers that are regularly inspected (minimum once per year)?		
27	Flammables (e.g., diesel, gas, propane) are stored in a separate storage room outside of the main building?		
28	Pesticides should be stored in a separate building and clearly identified with a warning sign?		
	Laneway and Water Supply (verify these items with local fire department)		
29	An all-weather laneway provides adequate fire truck access to the building?		
30	Roadway is regularly maintained (e.g., snow removed, adequately graded)?		
31	Adequate, year-round accessible water is available on-farm for fighting fires?		
32	A standard remote connector (i.e., hydrant) is installed adjacent to the water supply for direct connection by the local fire department?		
	Safety, Exit, and Lighting		
33	Enough exits are available to allow safe exit from all storeys and rooms?		
34	Emergency lighting and signage is available to mark the location of all exits?		
35	Proper ladders and stairs are used for exterior exit from upper storeys?		
36	Fire extinguishers are in place and all employees are trained for proper use?		
37	A clear path of travel to and through all exits is in place?		
38	The farm possesses fire alarm systems (e.g., smoke detectors) that can be heard and acted upon at any time of the day and night?		

Source: Adapted from Ontario Ministry of Agriculture, Food and Rural Affairs. Reducing the Risk of Fire on Your Farm. *Publication 837, 2011. Available at: www.omafra.gov.on.ca/english/engineer/barnfire/toc.pdf.*

To Prepare in Case of Evacuation

To Do		Yes	No
1	Contact local emergency management authority to become familiar with at least two possible evacuation routes.		
2	Arrange for a place to shelter animals (e.g., fairgrounds, other farms, racetracks, exhibition centres). Accommodation will need to include milking equipment for dairy goats (as applicable).		
3	Ensure that at least 72 hours worth of feed and medical supplies are available at the location.		
4	Contact potential carriers to arrange transportation in the event of an emergency. May need access to a portable loading ramp.		
5	Make sure animals have identification (e.g., ear tags or tattoos).		
6	Have adequate and safe fencing or pens to separate and group animals appropriately.		
7	Prepare an emergency kit that will follow the animals. The kit should include: • current list of all animals • basic first aid kit • handling equipment such as halters • water and feed • buckets • tools and supplies for sanitation • flashlights • portable radios (with weather radio band) and/or Weather radio • batteries • other safety and emergency items for your vehicles and trailers.		
8	Plan enough food, water, and emergency supplies for you and your family to last for at least 72 hours.		
9	Create a written order of evacuation that includes what animals or groups of animals will be evacuated first if not all animals can be transported at once.		

Source: Adapted from Public Safety Canada (2011) Emergency Preparedness for Farm Animals. *Available at: www.getprepared.gc.ca/cnt/rsrcs/pblctns/frm-nmls/frm-nmls-eng.pdf*.

Body Condition Scoring

Ontario Goat — Body Condition Score for Meat Goats

How to body condition score (BCS):

The hair coat can often prevent you from seeing the true shape of a goat and therefore, it is important that the hands-on assessment is done. A visual assessment alone is not adequate to assess poor body condition.

If you cannot score all your goats, choose a subset of goats in your herd. Alternatively, combine body condition scoring with other routine husbandry procedures such as hoof trimming or vaccination. Recording BCS is important as it may help you identify changes in an individual animal that may indicate disease or inform breeding and culling decisions. With practice, body condition scoring should take only 10-15 seconds per animal.

The three main locations to assess when performing body condition scoring are the lumbar spine, ribs, and sternum/breast bone (see figure 1). You are feeling for the bones in the goat. The amount of fat and muscle the goat has will change your ability to feel the bones underneath. If it is easy to feel the bones, the goat doesn't have enough fat and muscle. If you have trouble feeling the bones, the goat may have too much fat.

Tip: *Giving each goat a specific body condition score is not as important as being able to determine if your goat is under-conditioned (too thin), over-conditioned (too fat), or properly conditioned (healthy weight).*

Ideal body condition (acceptable range):

For most stages of production: 3.0 (2.5-4.0)

At kidding or before winter: 3.5 (3.0-3.5)

Does at breeding: 3.0 (2.5-3.5)

Bucks at breeding: 3.0 (3.0-3.5)

Does may lose up to one point during peak lactation, but should be allowed to regain this before kidding.

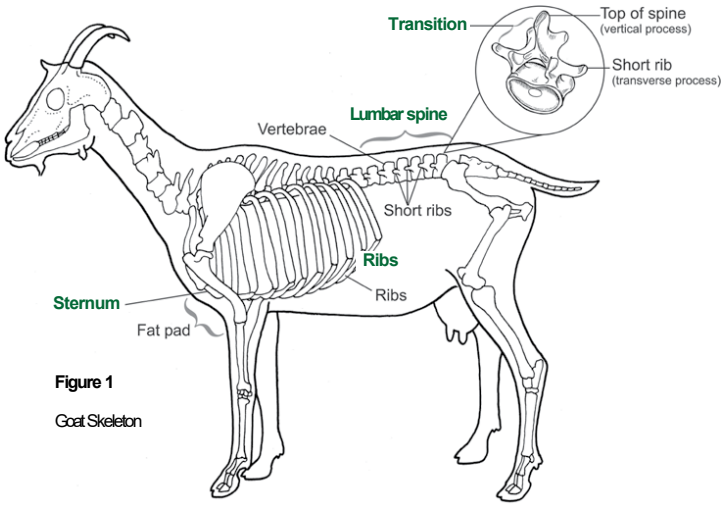

Figure 1

Goat Skeleton

Lumbar Spine: This is the part of goat behind the ribcage and in front of the tail, also known as the loin. The spine is made up of many connected vertebrae. Vertebrae have three processes that stick out – one on each side (short ribs) and one straight up (top of spine). Move your fingers from one vertebrae to the next, noting the shape of the space the between processes on the sides and top. See if you can slip your fingers under the short ribs or pinch the top of the spine. Feel the amount of fat or muscle in the space between the top of the spine and the short ribs (transition) (see figure 1).

Ribs: Assess the amount of muscle and fat cover over the ribs, behind the front leg. Try to push your fingers into the space between two ribs and note how much pressure it takes to feel for this space.

Tip: *Having an independent person perform body condition scoring on your goats may be beneficial. If the majority of your goats are a little over- or under-conditioned, you may think that is normal. You can always ask your veterinarian or nutritionist to perform body condition scoring on your goats and compare your assessments.*

Sternum: Assess the amount of muscle and fat over the sternum or breastbone, between the goat's front legs. This area has cartilage (slightly softer than bone) that connects the ribs to the breast bone. Note how easily the cartilage is felt. Grasp the fat pad on the sternum/breast bone to judge how large it is and whether you can move it.

Tip: *Body condition scoring is not about ranking your goats, but comparing them to the scale. Do not pick a doe that you think has an ideal BCS and compare everyone to her. Each goat should be compared to the BCS chart.*

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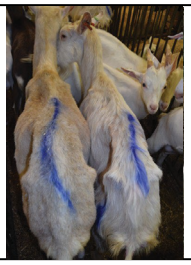
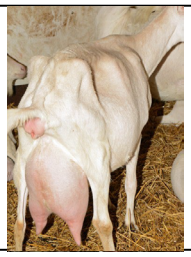
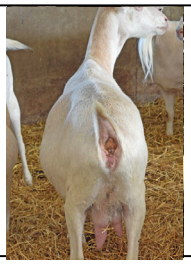
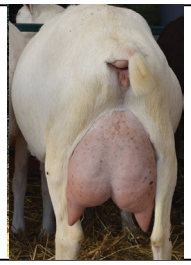
Body Condition Scoring (continued)

Body Condition Score for Dairy Goats*

	BCS	Lumbar spine	Ribs	Sternum	
Emaciated	BCS 1** 	**Top of spine:** clearly visible, can easily be pinched. Deep depression between each vertebra. **Short ribs:** form a continuous shelf that fingers can grasp. Deep depression between each. **Transition:** no fat and little muscle is felt between the top of the spine and short ribs.	**Ribs:** Clearly visible. Fingers easily penetrate space between ribs.	**Cartilage:** easily felt **Fat pad:** can easily be grasped between thumb and forefinger and moved side to side.	
Thin	BCS 2 	**Top of spine:** visible, some muscle can be felt between skin and bone. **Short ribs:** form a shelf that fingers can grasp. **Transition:** deep depression from the top of the spine to the short ribs.	**Ribs:** some can be seen. Fingers easily penetrate space between ribs.	**Cartilage:** not easily felt. **Fat pad:** can be grasped and moved slightly from side to side.	
Ideal	BCS 3 	**Top of spine:** not prominent, slight hollow between vertebrae. Cannot easily be grasped. **Short ribs:** shelf is slightly noticeable, cannot be grasped. **Transition:** smooth slope from top of the spine to short ribs.	**Ribs:** difficult to see. Space between ribs felt with pressure.	**Cartilage:** barely felt. **Fat pad:** wide and thick. It can be grasped, but has very little movement.	
Overweight	BCS 4 	**Top of spine:** cannot be seen. No indent between vertebrae. Top of spine is flat and cannot be grasped. **Short ribs:** no ridge or shelf present. **Transition:** rounded from the top of the spine to the short ribs.	**Ribs:** cannot be seen. Side of the animal is flat in appearance. Space between ribs only felt with strong pressure.	**Cartilage:** cannot be felt. **Fat pad:** difficult to grasp, cannot be moved side to side.	
Obese	BCS 5 	**Top of spine:** buried in fat, slight indent surrounded by bulging fat. Rump looks like the top of a heart. Individual vertebrae cannot be felt. **Short ribs:** individual vertebrae cannot be felt. **Transition:** fat bulges out from the top of the spine to the short ribs.	**Ribs:** not visible. Space between ribs cannot be felt.	**Cartilage:** cannot be felt **Fat pad:** cannot be grasped or moved.	

*One unit of Body Condition Score is equivalent to 7-10 kg (15-22 lb)
**Unfit for transport other than under advice of veterinarian

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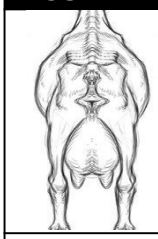
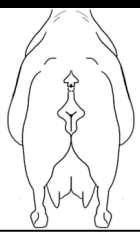
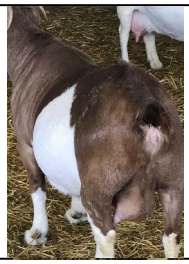
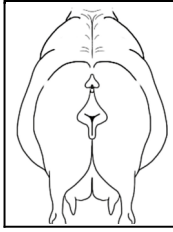
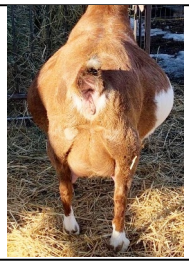
Body Condition Scoring (continued)

Body Condition Score for Meat Goats*

	BCS	Lumbar spine	Ribs	Sternum	
Emaciated	BCS 1** 	**Top of spine:** clearly visible, can easily be pinched. Deep depression between each vertebra. **Short ribs:** form a continuous shelf that fingers can grasp. Deep depression between each. **Transition:** no fat and little muscle is felt between the top of the spine and short ribs.	**Ribs:** Clearly visible. Fingers easily penetrate space between ribs.	**Cartilage:** easily felt **Fat pad:** can easily be grasped between thumb and forefinger and moved side to side.	
Thin	BCS 2 	**Top of spine:** visible, some muscle can be felt between skin and bone. **Short ribs:** form a shelf that fingers can grasp. **Transition:** deep depression from the top of the spine to the short ribs.	**Ribs:** some can be seen. Fingers easily penetrate space between ribs.	**Cartilage:** not easily felt. **Fat pad:** can be grasped and moved slightly from side to side.	
Ideal	BCS 3 	**Top of spine:** not prominent, slight hollow between vertebrae. Cannot easily be grasped. **Short ribs:** shelf is slightly noticeable, cannot be grasped. **Transition:** smooth slope from top of the spine to short ribs.	**Ribs:** difficult to see. Space between ribs felt with pressure.	**Cartilage:** barely felt. **Fat pad:** wide and thick. It can be grasped, but has very little movement.	
Overweight	BCS 4 	**Top of spine:** cannot be seen. No indent between vertebrae. Top of spine is flat and cannot be grasped. **Short ribs:** no ridge or shelf present. **Transition:** rounded from the top of the spine to the short ribs.	**Ribs:** cannot be seen. Side of the animal is flat in appearance. Space between ribs only felt with strong pressure.	**Cartilage:** cannot be felt. **Fat pad:** difficult to grasp, cannot be moved side to side.	
Obese	BCS 5 	**Top of spine:** buried in fat, slight indent surrounded by bulging fat. Rump looks like the top of a heart. Individual vertebrae cannot be felt. **Short ribs:** individual vertebrae cannot be felt. **Transition:** fat bulges out from the top of the spine to the short ribs.	**Ribs:** not visible. Space between ribs cannot be felt.	**Cartilage:** cannot be felt **Fat pad:** cannot be grasped or moved.	

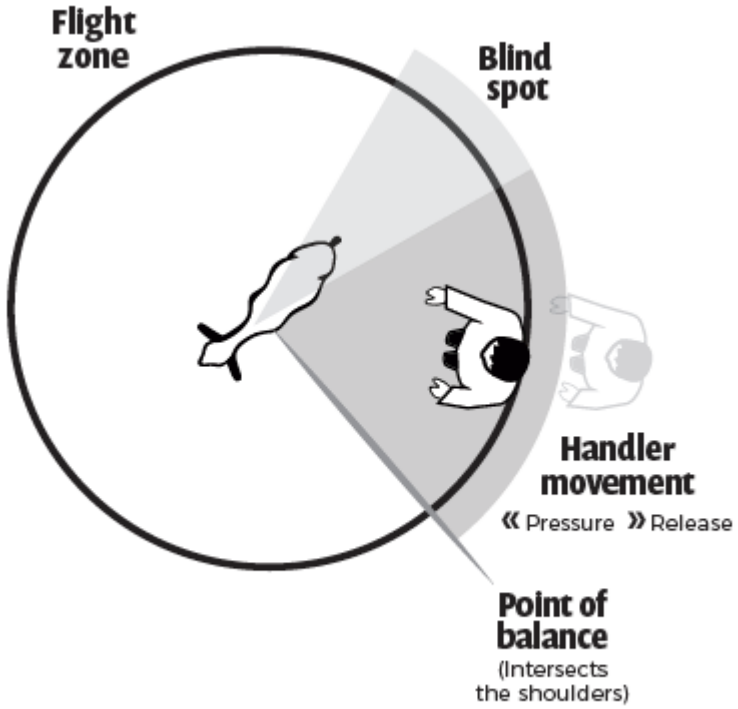
*One unit of Body Condition Score is equivalent to 7-10 kg (15-22 lb)
**Unfit for transport other than under advice of veterinarian

Ontario Goat · Growing Forward 2 · AAC · Ontario · Canada

Adapted from: Ontario Goat (2014) Body condition scoring. *Guelph ON: Ontario Goat.*

Photo credit: top right (BCS 1): BC SPCA; middle three (BCS 2 – 4); bottom right (BCS 5): Robin Schill

Goat Flight Zone



FLIGHT ZONE: Goats, like all animals, have a "flight zone." This can be compared to the goat's personal space which, if entered, will cause the goat to move away. Past experiences impact how large the flight zone will be. Goats that are not used to humans and being handled will have a larger flight zone than those that are routinely handled (using appropriate low-stress techniques). Understanding the impact of a stockperson entering (pressuring) or leaving (releasing) the flight zone will have on animal response will make handling goats less stressful. If a stockperson stands outside the flight zone the animal will not move. If the stockperson moves into the flight zone, the animal will move in a direction to avoid the stockperson.

The point of balance in most livestock is at the shoulder. The animal will move forward if the stockperson stands behind the point of balance and backward if the stockperson is ahead of the point of balance.

Source: Meat & Livestock Australia (2017) Factsheet 4: Understanding goat behaviour and handling. *Available at: www.mla.com.au/globalassets/mla-corporate/extensions-training-and-tools/documents/fs04-understanding-goat-behaviour-and-handling-final.pdf*.

Properly Trimmed and Overgrown Hooves

Hoof Aspect	Original Score		
	0	1	2
Toe Length	 **Toe is not overgrown** Length is less than half the length of rest of the hoof	 **Toe is moderately overgrown** Length is more than half but less than the length of rest of the hoof	 **Toe is severely overgrown** Length is greater than the full length of rest of the hoof
Heel Shape	 **Heel is upright** Not walking on heel Cornet band is parallel to ground	 **Heel is moderately dipped** Not walking on heel Cornet band is angled towards the ground	 **Heel is severely dipped** Walking on heel Coronet band angled sharply towards the ground
Fetlock Shape*	 **Fetlock is upright and straight**	 **Fetlock is dipped towards the ground** Bony lump on pastern may be apparent	
Claw Shape	 **Both claws straight**	 **One claw is bent/twisted** Either away or towards the midline	 **Both claws bent/twisted** Either away or towards the midline
Claw Splay**	 **Claws not splayed** Distance between the inside edge of claw tips is <4 cm	 **Claws moderately splayed** Distance between the inside edge of claw tips is > 4 cm and < 6 cm	 **Claws severely splayed** Distance between the inside edge of claw tips is > 6 cm

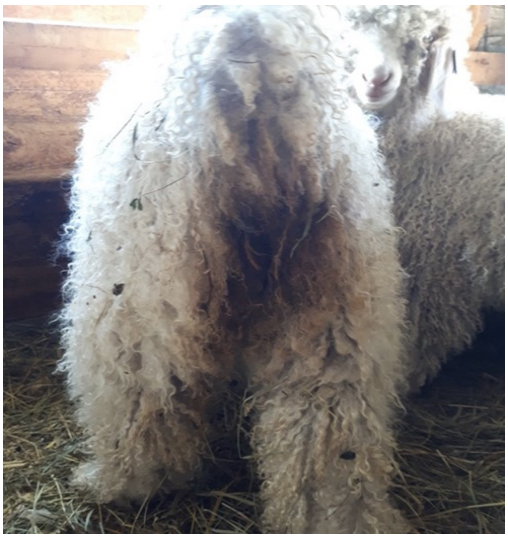
Figure H.1. Assessment of goat claw shape with the use of a 3-point ordinal scale (0, 1, and 2), except for fetlock shape, which was scored on a binary scale (0 or 1); 0 was "normal" in all cases.

* Fetlock scored as binary 0 or 1.

** Claw splay only scored if claw shape scored as 0.

Source: Deeming et al. (2019) The development of a hoof conformation assessment for use in dairy goats. Animals *9(11). DOI: 10.3390/ani9110973.*

Hair Problems around Genitals



Under clipped vulva area

Urine-stained hair removed from vulva area

Under clipped penis area

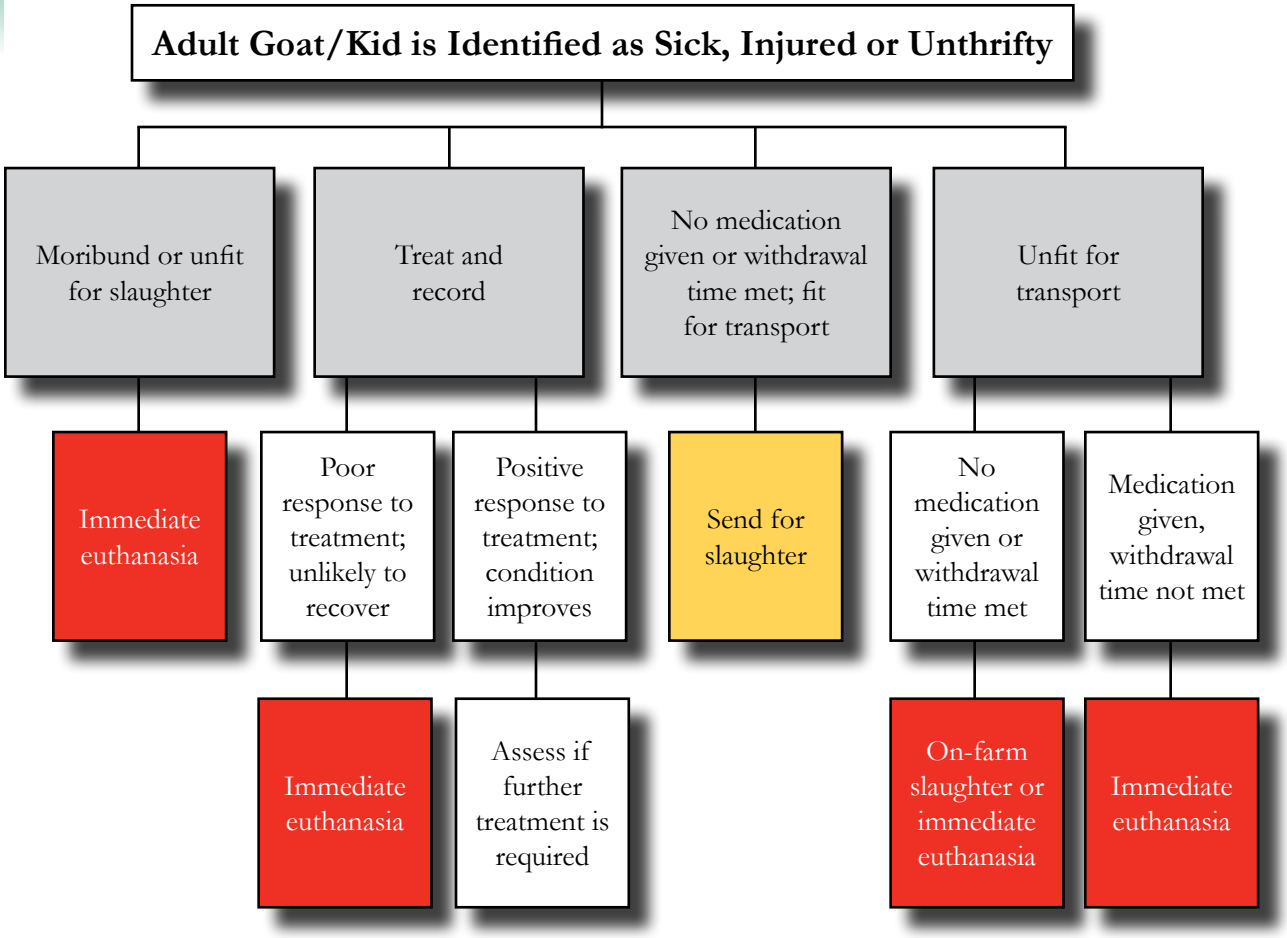
Urine-stained hair removed from penis area

Every 3 months, if the genital area is observed to be obstructed with urine-stained hair, it must be clipped to maintain good hygiene, and prevent pizzle rot and/or fly strike.

Source: Meat and Livestock Australia (MLA) (n.d.) Pizzle Rot. *Available at: www.veterinaryhandbook.com.au/Diseases.aspx?diseasenameid=207#:~:text=Pizzle%20rot%20is%20an%20infection,rams%2C%20bucks%20and%20wether%20goats).*

Photo credits: Theresa Bergeron

Example of Decision Tree for Euthanasia



Examples of criteria for euthanizing goats:

- weak, unable to stand
- unable to eat or drink
- severe injury (e.g., from predator attack)
- broken leg with exposed bone
- exposed internal organs
- moderate to severe lameness
- rectal or vaginal prolapse (persistent or damaged)
- severe body weight loss (20% or greater).

Adapted from: Turner, P.V., Doonan, G., 2010. Developing on-farm euthanasia plans. Canadian Veterinary Journal 51(9): 1031–1034. *Available at: www.ncbi.nlm.nih.gov/pmc/articles/PMC2920162/. Accessed September 27, 2012.*

Lameness Scoring

Table K.1 – Description of Locomotion Scoring Systems Available for Goats

Category	Willing to move forward	Weight-bearing	Head nodding	Description
1. Normal gait	Yes	Yes	No	Even gait, walking unhalted.
2. Uneven gait	Yes	Yes	No	Short stride, stiff gait, or swinging of hoof.
3. Mild lameness	Yes	Yes	Maybe	Mild limp. Affected limb not readily identifiable.
4. Moderate lameness	Reluctant	Reluctant	Yes	Moderate limp. Affected limb(s) identifiable.
5. Severe lameness	Unwilling	Unable	Yes (severe)	Severe limp, unable to bear weight on all 4 legs. May walk on knees or with limbs stretched and not bending joints (i.e., goose-stepping).

Source: Adapted from Goat Code of Practice Scientific Committee (2020) Code of Practice for the Care and Handling of Goats: Review of Scientific Research on Priority Issues. *Lacombe, AB: National Farm Animal Care Council.*

Important and Serious Infectious Diseases of Goats: Signs and Causes

Clinical Signs of Infectious Disease	Possible Causes	Level When Considered Serious
Pregnant does: Late term abortions, stillbirths, and weak newborn kids.	*Common:* Abortion caused by *Chlamydia abortus, Coxiella burnetii* (Q fever) and *Toxoplasma gondii.* *Important but less common:* campylobacteriosis, listeriosis, Cache Valley, leptospirosis, and salmonellosis. *Other Issues:* Many causes are zoonotic. Goats (males and females) may be carriers of *C. abortus* or *C. burnetii.* Cats contaminate feed with oocysts of *T. gondii.*	When exceeds 5% of pregnancies; often may be 20% to 40% over a short period of time.
Newborn and nursing kids: Severe depression, joint ill, neurological signs, and death in young kids.	*Common:* Septicaemia caused by bacteria (e.g., *E. coli, Staphylococcus* spp, *Streptococcus* spp) from the environment. *Important but less common: Listeria monocytogenes, Salmonella* spp. *Other Issues:* often due to poor transfer of colostral antibodies and a dirty environment or feeding equipment.	The proportion of kids affected can be high and should not be greater than 5% of kids born alive. Most kids die or need to be euthanized.
Nursing kids in first 2 to 3 weeks of life: Diarrhea, depression, and dehydration.	*Common:* Neonatal diarrhea caused by *Cryptosporidia, E. coli* and rotavirus. Often more than 1 cause is found. *Important but less common: Salmonella* spp, *Clostridium perfringens.* If kids are bright, may be nutritional (quality and quantity of milk, milk replacer). *Other Issues:* The number of cases can escalate quickly when the pathogens build up in the environment, particularly when combined with dirty environment, poor colostrum management and feeding practices.	The number of cases can be high and should not be greater than 5% of kids. The level tends to rise very quickly in the group.
Nursing and weaned kids 3 weeks to 6 months of age: Diarrhea, dysentery (bloody diarrhea), and poor growth.	*Common:* Coccidiosis due to *Eimeria* spp. *Other Issues:* The eggs have built up in the environment. Feed and water may be contaminated. May be worse when kids are stressed with other diseases (e.g., pneumonia) and where stocking densities are high.	Most often the entire group is affected with reduced growth, although severe disease may only be apparent in a proportion (5 to 10%).

Important and Serious Infectious Diseases of Goats: Signs and Causes (continued)

Clinical Signs of Infectious Disease	Possible Causes	Level When Considered Serious
Any age, more common in youngstock: Fever, depressed, coughing, off-feed, nasal discharge, and difficulty breathing	*Common:* Bacterial pneumonia, most often due to *Mannheimia haemolytica* type A2. *Mycoplasma ovipneumonia* may cause milder disease. *Important but less common: Pasteurella multocida, Trueperella pyogenes* and *Bibersteinia trehalosi*. The most important virus is bovine respiratory syncytial virus (BRSV). *Other Issues:* Other stressors increase the risk of outbreaks.	Acutely this can affect more that 20% of the group, particularly youngstock. May also see acute death. Chronic pneumonia is common where treatment failed or not provided in time.
Any age: Severe diarrhea, dysentery, and dehydration in adults and older kids.	*Common:* Enterotoxaemia due to *Clostridium perfringens* D. *Other Issues:* Most often associated with feed changes or feeding management issues. High grain or pellet diets with inadequate forage may worsen outbreaks. Sudden changes from poor to lush pasture. No or inadequate vaccinations associated with the highest level of disease and death.	May see outbreaks of losses (5 to 10% or greater) or a high level of new cases over time (e.g., 2–3 per month). The case fatality rate is high (close to 100% in kids and 10 to 30% in adults).
Any age: Seen in grazing goats. Anaemia, diarrhea, edema (e.g., bottle jaw, abdominal), and poor growth. If severe enough, causes sudden death. Signs may appear while housed around kidding time due to infection picked up in the previous grazing season.	*Common:* Gastrointestinal parasitism. The most pathogenic GI parasite is *Haemonchus contortus*, which causes severe anaemia. I*mportant but less common: Teladorsagia* and *Trichostrongylus* cause poor appetite and growth, with diarrhea. *Other Issues:* Grazing practices greatly influence levels of pasture contamination with parasite eggs. Goats do not develop strong immunity to parasites. Resistance of *H. contortus* to dewormers is common.	The level of gastrointestinal parasitism in grazing goats can quickly change from no evidence of illness, to > 5% showing severe signs of disease, with a higher proportion sub clinically affected. Sudden death may also occur if animals are not routinely monitored for level of parasitism.

Important and Serious Infectious Diseases of Goats: Signs and Causes (continued)

Clinical Signs of Infectious Disease	Possible Causes	Level When Considered Serious
Any age: Neurological signs, e.g., paralysis of the hind end or face, unable to swallow, circling, convulsions, blindness.	*Common:* There are a many neurological diseases and diagnosis can be challenging. Listeriosis is common in goats fed poorly ensiled forages. Polioencephalomalacia (polio) is associated with high grain feeding. *Important but less common:* Rabies and scrapie are reportable to the government. *Corynebacterium pseudotuberculosis* may cause abscesses in the brain and spinal column. Septicaemic conditions in kids cause meningitis.	Depending on the cause, the number of cases over time may be high or outbreaks of disease may be seen.
Lactating and dry does: Swollen udder, abnormal milk, reduced milk production. Occasionally will see high fever, gangrene of the udder and death losses of up to 50% of cases.	*Common:* Mastitis is very common and can be acute or chronic, severe or mild. There are many bacteria that cause mastitis. The most common cause of severe gangrenous mastitis is *Staphylococcus aureus*. *Streptococcus* spp, *Trueperella pyogenes* and some non-aureus staphylococci are less severe but still cause illness. *Important but less common:* Both *Pseudomonas* spp and *Mannheimia* spp can cause severe mastitis. *Other Issues:* There are many risk factors related to milking practices and teat health to consider. *S. aureus* is very contagious doe-to-doe.	While severe cases may not be common (1 to 2% per year), cases of clinical mastitis > 10% of the herd should be investigated. Severe mastitis in meat goats is mostly seen at kidding, weaning, or when in peak lactation (3–6 weeks post-kidding).
Adult goats, usually > 3 years of age: Arthritis of joints causing lameness, poor milk production, and hard udder without other signs of mastitis. Rarely neurological signs.	*Common:* Caprine arthritis encephalitis (CAE) virus. The virus is transmitted mainly through respiratory secretions, but also colostrum and milk, with young kids most susceptible. This is a chronic disease and may take 3 to 5 years for an infected goat to show signs of disease. There is no treatment.	Animals with signs of disease are only the tip of the iceberg with many more animals affected. The level of clinically affected animals should not exceed 5%.
Adult goats, as young as 1 year of age but most commonly > 3 years of age: Affected goats will lose condition over 2 to 6 weeks, to the point of severe wasting, weakness, and death. Occasionally they may develop terminal diarrhea.	*Common:* Johne's disease (paratuberculosis) due to *Mycobacterium paratuberculosis*. The bacteria are shed in the feces, milk, and colostrum of infected goats. The environment becomes contaminated, and the bacteria can survive months to years. Kids are most susceptible to infection. There is no treatment.	Animals with signs of disease are only the tip of the iceberg with many more animals affected. The level of clinically affected animals should not exceed 5%.

Transport Decision Tree

The transport decision tree is a tool used to help make animal transport decisions. It is a summary based on Part XII of the Health of Animals Regulations (HAR), and provides some examples. If ever in doubt, do not load the animal(s) and contact your veterinarian. Refer to Part XII of the HAR for official wording and guidance.

FIT ANIMALS

TRANSPORT

- Those fit for the intended transport process before transport begins are monitored on an ongoing basis and at a frequency to check that they remain fit through the journey (and if needed, receive prompt care). A fit animal are those that will arrive at their final destination in good condition.
- Maximum feed, water, rest (FWR) interval of 36 hours
- As indicated in the *Health of Animals Regulations – Part XII* (Transport of Animals) and CFIA regulatory guidance
- Consult also the *Code of Practice for the Care and Handling of Farm Animals: Transportation*

*Special Provisions for Compromised Animals

Compromised animals, if loaded, must be transported **directly** to the nearest suitable place to receive care, treatment, be slaughtered or euthanized – but only with special provisions including, but not limited to:

- separated from other animals *(exception: one familiar animal is permitted to accompany the compromised animal if it is not likely to cause suffering, injury or death to either animal)*
- loaded individually in rear compartment (without having to negotiate ramps within the conveyance)
- measures taken to prevent animal's suffering (e.g. extra bedding, pain medication, frequent access to feed and water, etc...)
- local direct transport only - **not taken to an assembly centre to be sold**
- provided with access to feed, water and rest in intervals of no more than 12 hours
- **other measures as appropriate** (e.g. veterinary assessment prior to loading when unsure of animal's capacity to withstand transportation)

COMPROMISED ANIMALS

TRANSPORT WITH SPECIAL PROVISIONS*

(Health of Animals Regulations Part XII)

Examples:

- Abscess (single and/or open, causing discomfort, pain or interfering with movement)
- Acute penis injury
- Amputation or deformity (only if fully healed and not painful)
- Blindness in both eyes
- Bloated (if not weak or already down)
- Broken horn or scur (with evidence of bleeding or infection)
- Heavy lactation if not milked at intervals to prevent mammary engorgement
- Mild lameness (refer to *App L*) able to bear weight and keep up with the group (any lame animal other than those listed as unfit is considered compromised)
- Intermittent or treated rectal or vaginal prolapse
- Not fully healed after surgical procedures, such as dehorning or castration
- Open wound (depending on the severity of the wound, the animal may be unfit, e.g. laceration, puncture)
- Orf lesions that are painful, interfering with eating or appear infected
- Overgrown hooves that impede the mobility of the goat (refer to *Appendix H*)
- Vulnerable animals (≤8days of age, kids solely on milk)

Do not continue to transport an animal that becomes compromised or unfit beyond the nearest available place where it can receive care, be euthanized or slaughtered.

UNFIT ANIMALS

DO NOT TRANSPORT

***Other than under the advice of a veterinarian*

Examples:

- Any tendon/ligament/nerve damage that causes impaired function or movement
- Body condition score (BCS) <1
- Body condition score (BCS) <2 and evidence of weakness or exercise intolerance
- Bloated to extent signs of discomfort or weakness are exhibited
- Fracture (e.g. limb, jaw, penis)
- Gangrenous udder
- In shock or dying
- Laboured breathing (e.g. Pneumonia)
- Likely to give birth (i.e. last 15 days of pregnancy) or has given birth in preceding 48 hours
- Mastitis (e.g. clinical mastitis causing pain, fever, blue bag, swelling, etc...)
- Multiple abscesses affecting the animals welfare (i.e. open or painful)
- Neurologic signs (e.g., lack of balance or seizures)
- Prolapsed uterus, severe rectal, or severe vaginal prolapse
- Rectal temperature >40°C
- Retained placenta (e.g. >48 hours) or metritis (vaginal discharge, systemic infection)
- Severe lameness (e.g. non-weight bearing on one or more limbs, reluctant or unable to move, refer to Appendix K)
- Severe open wound
- Signs of dehydration (tacky mucous membranes, skin tent over eye, sunken eye)
- Signs of hyperthermia (rectal temperature >40.5°C, panting, openmouth breathing) or hypothermia (rectal temperature < 37°C, cold extremities, shivering, hunched appearance)
- Unable to rise, remain standing, move without assistance, or reluctant to move (non-ambulatory)
- Unhealed or infected navel

*****Refer to Section 7.1 for exceptions for loading unfit animals.**

Source: Adapted from the Code of Practice for the Care and Handling of Beef Cattle *(2013). Available at: www.nfacc.ca/codes-of-practice/beef-cattle.*

Anatomical Landmarks for Euthanasia

Firearms

Poll position - preferred position

Firearms should be held 10–30 cm from the goat, never directly against the goat. In an adult goat, the firearm should be directed slightly behind the poll and aimed towards the lower chin. In kids, this site can be found at the intersection of two lines drawn from the outside corner of the eye to the centre of the base of the opposite ear with the projectile directed toward the back of the throat (see Figure N.1 for poll position in polled and horned goats).

Frontal position – not preferred

For especially large-horned goats, where the poll position may be difficult to use, the firearm can be aimed high on the forehead toward and in line with the spinal column of the cervical vertebra. **This position is not preferred** and should only be used if the poll position is not accessible.

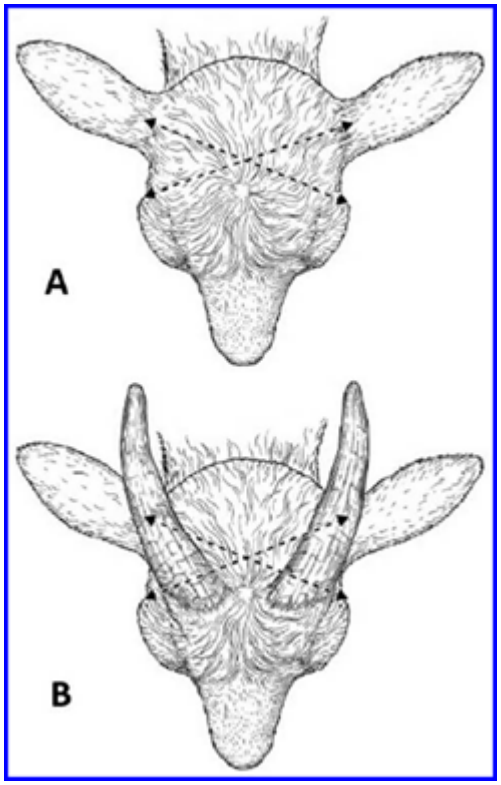


Figure N.1. Method for determining the proper anatomic site of a polled goat (A) and horned goat (B) by use of a firearm or captive bolt device.

Penetrating Captive Bolts (PCB)

The ideal location for placement of a captive bolt is perpendicular to the skull at the intersection of 2 lines drawn from the outside corner of each eye to the middle of the base of the opposite ear. The captive bolt should be aimed toward the base of the tongue. This location is used for both horned and hornless goats and can be used on all ages. This position corresponds to slightly behind the poll. **A frontal position must not be used when euthanizing a goat with a captive bolt.**

Non-penetrating captive bolts (NPCB)

Poll position – ***only appropriate for kids < 8 days***

Captive bolts must be placed directly against the goat, aiming the NPCB between the ears on the midline while tucking the kid's chin into the neck (Figure N.2).

Figure N.2. Poll position for euthanasia of kids < 8 days of age using a non-penetrating captive bolt.

Source: Adapted from the American Veterinary Medical Association. AVMA guidelines for the humane slaughter of animals: 2016 edition; *JK Shearer, Iowa State University; adapted from the* AVMA Guidelines for the Euthanasia of Animals: 2020 Edition.

Secondary Steps to Cause Death

Required for captive bolt device euthanasia.

A goat must be unconscious before a secondary step is applied. Refer to *Section 8.3 – Confirmation of Loss of Consciousness and Death.*

Bleeding out (exsanguination)

Bleeding out of an unconscious animal (previously stunned with a captive bolt device or firearm): A sharp, single-sided blade is inserted into the neck below the cervical vertebrae (i.e., the bones of the neck) and behind the back of the jaw (Figure O.1). The blade is drawn forward to cut both jugular veins and carotid arteries, as well as the trachea. Blood should immediately flow freely, and death occurs within minutes. Alternatively, the large blood vessels located under a foreleg in the axilla region (i.e., armpit area) may be cut (Figure O.2). The leg should be kept elevated until the bleeding stops and the animal is dead. After bleeding out, death must be confirmed according to criteria described in *Section 8.3 – Confirmation of Loss of Consciousness and Death.*

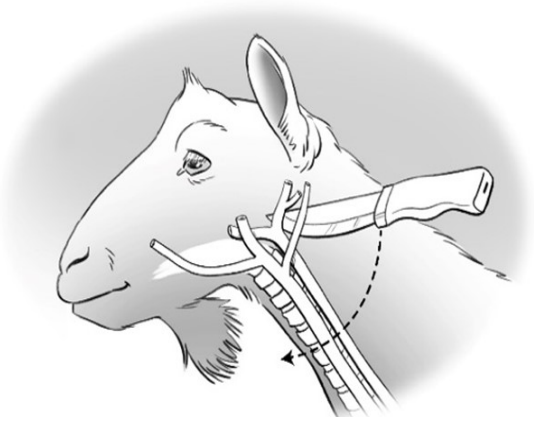


Figure O.1. Exsanguination by severing major blood vessels in the neck

Figure O.2. Exsanguination by severing major blood vessels in the axilla region

Pithing

Pithing is the process of destroying the brain tissue of an unconscious animal to prevent a return to consciousness and assure death. Pithing is performed by inserting a rod through the hole in the skull created by the penetrating captive bolt device. The operator manipulates the pithing tool to destroy brainstem and spinal cord tissue. After pithing, death must be confirmed according to criteria described in *Section 8.3 – Confirmation of Loss of Consciousness and Death.*

Ask the herd veterinarian to confirm that the pithing tool is appropriately sized for the size of goats on your farm. A disposable pithing rod is best for biosecurity but a reusable tool can also be used. The tool must be long enough to reach the brain where it connects to the spinal cord at the base of the skull. The rods must be carefully cleaned or disposed of after each use.

At first, pithing will cause involuntary muscle contractions such as uncoordinated kicking, but the muscles will gradually relax and movement will cease. Be sure to stand well away from the legs of the goat when pithing. This movement is not a sign of consciousness and the animal is not in pain. The carcass is no longer safe for consumption due to possible contamination. Producers are also advised to confirm that pithing will not affect dead stock removal.

Secondary Steps to Cause Death (continued)

Intravenous Injection

A solution of potassium chloride (KCl, also known as a sodium-free salt substitute) or magnesium sulfate (MgSO4, also known as Epsom salts) is injected directly into an unconscious goat's vein or heart to make the heart stop beating. Proper intravenous injections of these substances can be challenging, especially in young, extremely ill, and/or dehydrated goats: that is why intracardiac is sometimes preferred. After injection, death must be confirmed according to criteria described in *Section 8.3 – Confirmation of Loss of Consciousness and Death*.

Contact the herd veterinarian to determine the appropriate concentration of powder to water. The solution will not work if injected peri-vascular (around the vein), intramuscular, or subcutaneously. Injection of these substances into a conscious goat is prohibited as it causes extreme pain. Do not inject any other substances.

Intracardiac Injection

Contact the herd veterinarian to determine the appropriate concentration of powder to water. Using a 60 mL syringe filled with a solution of KCl (or $MgSO_4$), attach a 14-gauge 2-inch needle, and inject directly into the heart. The heart is found behind the point of the elbow and 5 to 10 cm from the bottom of the chest (depends on the size of the animal; Figure O.3). In addition, using 1-2 fingers pressed firmly in that location (between ribs), the exact injection site will be where you feel the maximum intensity of the animal's heartbeat. Insert the needle perpendicular to the body wall and draw back on the syringe. You know you are in the correct location when you draw back on the syringe and see blood. You may have to redirect the needle until blood is seen in the syringe. Inject the full 60 mL solution. Confirm death according to criteria described in *Section 8.3 – Confirmation of Loss of Consciousness and Death*.

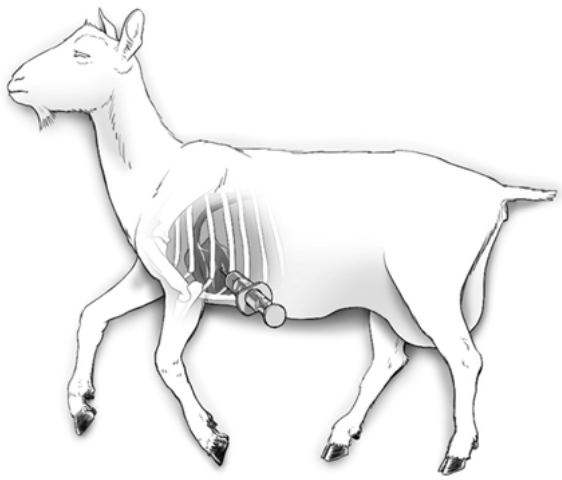


Figure O.3. Location of heart for intracardiac injection

Source: Adapted from Iowa State University Procedures for the Humane Euthanasia of Sick, Injured and/or Debilitated Livestock. *Available at: www.vetmed.iastate.edu/sites/default/files/vdpam/Extension/Dairy/Programs/Humane%20Euthanasia/Download%20Files/EuthanasiaBrochure20130128.pdf*.

Sample On-Farm Euthanasia Action Plan

Work with the herd 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 herd 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: _____

Herd veterinarian: _____ Phone: _____

Emergency phone: _____

Deadstock collection service: _____ Phone: _____

On-farm disposal plan, following provincial regulations:

_____

_____

Contact for deadstock disposal (if applicable): _____ Phone: _____

	Primary euthanasia method	**Secondary step (if using captive bolt)**	**Person(s) trained to perform primary method**	**Alternate euthanasia method**	**Person(s) trained to perform alternate method**
Kids (< 5kg)					
Kids (>5 kg)					
Does					
Bucks					

Source: Adapted from Ontario Goat (2017) Approved Methods of Euthanasia in Goats. In: On-Farm Welfare Producer Education Package. *Available at: www.ontariogoat.ca/on-farm-welfare-producer-education-package/.*

Acceptable Calibres and Cartridges for Euthanasia of Goats

	Gun calibre	Cartridge	Notes
Kid	.22	.22 short/long/long rifle	Move kid to an area well away from hard surfaces such as concrete to ensure safety in case of over-penetration.
Adult hornless goat	.22	.22 long/long rifle	Birdshot is only safe at very close range (must hit animal before it spreads out). Slugs are recommended.
	.22 magnum	.22 magnum	
	.410 shotgun	1/5 oz slug #4/#6 bird shot	
Mature buck/ horned adult	.22 magnum	.22 magnum	Shotguns or higher-calibre firearms loaded with solid-point bullets are preferred.
	.410 shotgun	1/5 oz slug #4/#6 birdshot	
	20 gauge	5/8 oz slug #4/#6 birdshot	

Source: Adapted from Ontario Goat (2017) Approved Methods of Euthanasia in Goats. In: On-Farm Welfare Producer Education Package. *Available at: www.ontariogoat.ca/ on-farm-welfare-producer-education-package/*.

Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning

Introduction

- these standards are science based and are intended to improve animal welfare
- pre-slaughter stunning (including reversible stunning) renders an animal insensible yet alive. This is the best method to control anxiety, pain, and suffering throughout slaughter
- where slaughter without stunning is permitted by regulation, care must be taken to achieve effective control and reduction of anxiety, pain, and suffering for all animals throughout slaughter
- if pre-slaughter stunning is not performed, then immediate post-cut stunning is a best practice which will reduce the potential for animal suffering
- these standards are based on best practices that should apply to all slaughter establishments.

Definitions

Agonal movements – the twitching and jerking reflex movements as an animal is dying.

Back up stunning equipment and stunning methods – equipment that is kept ready and available for use if the primary method does not work properly.

Coercion – forcing an animal using a painful or stressful procedure, so it has no option but to comply without enduring more pain or stress.

Lairage – animal handling facilities at abattoirs, including loading ramps, laneways, weigh-scales, holding areas for animals in crates, pens, and feeding and watering facilities.

Nystagmus – rapid movement of the eyeball in any direction (side to side, up and down, or in a circular pattern).

Rhythmic breathing – in and out breathing pattern of more than two movements, commonly accompanied by flaring of the nares and expansion of the chest wall.

Sensibility – a state of awareness, able to feel pain and/or to respond to touch, sound and/or what is seen.

Smooth, quiet operation of equipment – operation of equipment without jerky movements, hissing or loud noises.

Stunning – rendering an animal insensible. There are two kinds of stunning: reversible (e.g., gas inhalation and some electric stunning) and irreversible (e.g., captive bolt and head to cardiac electric stunning).

Post-cut stunning – the process of stunning animals immediately after they have been cut; this action can reduce suffering in animals that are cut but not stunned.

Pre-slaughter stunning – the process of stunning animals immediately prior to the cut.

Reversible stunning – a stunning process whereby animals eventually have the potential to regain sensibility.

Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning (continued)

Scope

This document **includes** guidance on restraint, neck cutting, and post-cutting management.

This document **does not include** changes to existing applicable provincial/federal regulations or legislation.

If these words are used, they offer some flexibility:

Recommend/encourage/should: the practice is viewed as best practice, but other methods will be accepted as long as the goal of high welfare is not jeopardized.

If these words are used, strict adherence is required:

Prohibited: the practice described is banned.

Must: the standard has to be adhered to as directed.

Standards that Apply to All Slaughter Facilities

1. Commitment to protecting animal welfare by taking the responsibility for the training, competency, and validation of the skills and ability of everyone involved;
2. Develop, implement, and review effective written standard operating procedures (SOPs) and training procedures. These are to include measurable criteria of success, regular monitoring of procedures, and records of outcomes. Alternative solutions that achieve the same animal welfare outcomes may be considered for very small plants;
3. Training programs for people who handle, cut, or stun live animals include a knowledge of animal behaviour and physiology, handling and restraint, signs of stress and pain, and best practices for minimizing the time to loss of sensibility at slaughter, as well as equipment maintenance, including knife sharpening;
4. The operator/management provides assurance that employees have the ability to recognize when an animal is insensible, when an animal is possibly returning to sensibility, and when an animal is dead;
5. Ensure the welfare of animals at all times by the application of best practices and applicable regulations to the transport, unloading, lairage, restraining, stunning, and slaughter of animals;
6. Animals that are not suitable for slaughter must be handled and killed humanely;
7. Apply a monitoring program to verify that animals are calm at the time of slaughter and are not subject to undue stress, pain, or suffering during the handling, restraint, slaughter, and bleed out until death is confirmed, validating that the animal was cut or stunned effectively and bled out rapidly;
8. Implement a system for rapid identification of failures to meet welfare standards and timely implementation of corrective actions that include documentation of issues and corrective actions taken to address specific and larger underlying problems.

Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning (continued)

Standards for Mammalian Slaughter without Stunning

1. Restraint

1. Each mammal must be individually restrained in a comfortable position, either manually or with the use of equipment;
2. All mammals must be restrained in an upright position;
3. Inverting mammals for slaughter without stunning is prohibited because it results in distress, pain, and aspiration of stomach/rumen fluids;
4. Effective and humane commercial restraint equipment systems are available for cattle, sheep, and goats. These must be used within the limits of the equipment (size, horns, etc.);
5. Restraining equipment, including both the body and head restrainers, must be designed, located, and constructed to suit the size, species, and type of animal being slaughtered. It must be functional, properly maintained, and used correctly to enable:
    - secure footing for the animal
    - smooth, quiet operation of equipment
    - the animals to enter readily and without coercion
    - the animals to be held forward by a pusher or a similar restraining device
    - the animals to fit comfortably into the forehead bracket and chin lift, or similar device if being used, which:
        - provides proper access at the correct angle for effective neck cutting and bleeding out without overextension of the neck
        - applies only moderate but firm pressure
        - avoids excessive dorsal neck bend (backward bending)
        - requires no additional form of restraint (e.g., no nose tongs)
    - adequate monitoring of the animal, including the head, for loss of sensibility
    - adequate access to the head and the neck for accurate neck cutting and bleeding, and application of the stunning equipment when required;
6. Nothing in the design, location or use of the restraining device or manual restraint must obstruct the flow of blood, including:
    - the closing of the edges of the cut
    - contact of the neck cut with the restraint device
    - overextension of the neck
    - excessive restraint in the box
    - ballooning (constrictions of the cut ends of the carotids)
    - excessive agonal movements that hamper bleeding;
7. Mammals must remain calm during the slaughter process. Temperament of the animal should be considered in whether they are suitable for this process;
8. If an animal is agitated and cannot be restrained for a proper cut, it must be stunned immediately;
9. The head must be supported after the cut to maximize blood loss, minimize mechanical impact on the surfaces of the wound, and permit proper monitoring until loss of sensibility;
10. Manual restraint, when used, must suit the size, species, and type of animal being slaughtered, and meet all other requirements noted above; and
11. Level of fatigue of the personnel on the effectiveness of manual restraint must be taken into consideration.

Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning (continued)

2. Neck cutting

1. A trained competent individual must carry out the cut;
2. The knife must be at least twice as long as the width of the animal's neck;
3. The knife must be sharp and undamaged for each animal so that the cut can be made with a minimum of pressure and the requirements in this section can be met. Knives must be checked before each cut for imperfections and sharpness. If requested, knives must be able to pass the paper test or any other comparable test for sharpness before a cut is made. To perform the paper test, dangle a piece of printer paper by one corner with thumb and forefinger. When the knife is held in the other hand, it should be able to slice through the edge of the paper;
4. The slaughter person must be proficient in how to sharpen a knife and keep it free of nicks;
5. The animal must not be restrained until the slaughter person is ready to perform the cut. Once the head is restrained, the neck cut must proceed with no more than a 10 second delay;
6. The cut must be a single pull stroke of the knife in all circumstances except if required with large ruminants where this can be extended into a total of a single pull and a push fluid stroke without interruption;
7. Based on the skin thickness, coat thickness, age, and size of the animal an appropriate cut may not be possible and these points should be considered in the selection of animals;
8. At no time must the knife be removed and reinserted;
9. The knife point must not be used in a stabbing or poking motion;
10. Both carotid arteries and jugular veins must be completely severed with the cut. Blood loss must be rapid enough to cause a rapid loss of sensibility meeting timelines stated elsewhere in this document;
11. Procedures that could cause distress or pain and suffering (including palpation, second neck cuts, tissue collection) must not be done until the animal is insensible;
12. Animal welfare and the loss of sensibility must be monitored for every animal through cutting and bleeding until death; and
13. Back up stunning equipment and methods must be readily available and suit the size, species and type of animal being slaughtered.

Small ruminants (goats and sheep) must be stunned immediately if they **do not lose sensibility within 15 seconds post cut.**

3. Post-cut management

All mammals must be confirmed to be insensible before they are moved or manipulated.

Slaughter without stunning does not have a step that results in instantaneous insensibility, therefore:

1. In slaughter without stunning animals require a longer time to become insensible;
2. Animal welfare must never be compromised to increase speed of the line or productivity;
3. Animals must be monitored for loss of sensibility;
4. Back up stunning equipment and methods must suit the size, species, and type of animal. They must be applied correctly, and must have proper maintenance as stunning must be performed safely and rapidly if required to protect animal welfare;
5. Back up stunning equipment must be readily available and prepared for immediate use, and in good working order at all times;

Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning (continued)

6. Mammals must be stunned immediately if they are showing vocalizing movements (see below for details) after the cut;
7. Small ruminants must be immediately stunned if they do not lose sensibility in 15 seconds;
8. Mammals must be insensible before a hand or any object is placed in the wound. If bleeding is accidentally being prevented, stunning must be applied before correction measures are applied;
9. Mammals must be insensible before the restraining device is released, unless required to apply a post-cut stunning;
10. Mammals must not be wholly or partially lifted, inverted, shackled, or suspended by any means until the animal has lost sensibility; and
11. Dressing procedures must not be performed on an animal that shows signs of a possible return to sensibility.

Regardless of the choice of slaughter technique, sensible animals are prohibited on the bleed line.

4. Mammalian signs of loss of sensibility

The time to loss of sensibility varies between species and among individual animals. Therefore, slaughter persons need to identify when each animal has lost sensibility:

1. No rhythmic breathing;
2. No natural blinking, tracking of movement, or other eye movements including nystagmus;
3. Permanent loss of muscle tone and righting reflex:
   - A righting reflex is seen when an animal attempts to retain or regain upright body posture;
4. No vocalization or vocalization movements:
   - For slaughter without stunning: the larynx (voice box) is severed from the trachea, so vocalization per se is not possible. However, animals that show vocalizing movements after the cut (e.g., mouth open, neck extended, tongue rolled) must be stunned immediately even if no other signs of sensibility are observed;
5. Floppy head ("rag doll-like"):
   - Loose tongue
   - No controlled tongue or lip movements.

The presence of any one of these: rhythmic breathing, natural blinking, righting reflex, vocalization movements, controlled tongue or lip movements, indicates the animal may return to sensibility and must be stunned immediately.

Source: Adapted from Council of Chief Veterinary Officers (2018) Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning. *Available at: www.ahwcouncil.ca/pdfs/Slaughter%20without%20Stunning%20Standards%20approved%20September%207%202018-2.pdf*.

Resources for Further Information

More information on goat production and welfare is available through federal and provincial ministries of agriculture, national or provincial goat organizations, universities and colleges, animal welfare organizations, and veterinary organizations.

Producer Organizations

Alberta Goat Association
Website: www.albertagoats.com
Alberta Mohair Producers Association
Phone: (403) 728-3488
British Columbia Goat Association
Website: www.bcgoat.ca
Canadian Goat Society
Website: www.goats.ca
Canadian Meat Goat Society
Website: www.canadianmeatgoat.com
Canadian National Goat Federation
Website: www.cangoats.com
Manitoba Goat Association
Website: www.sites.google.com/site/manitobagoatassociation1a/home
Ontario Dairy Goat Co-operative
Website: www.ontariodairygoat.com
Ontario Goat
Website: www.ontariogoat.ca
Saskatchewan Goat Breeders Association
Website: www.saskgoatbreeders.com

Farm Animal Councils

Alberta Farm Animal Care
Phone: (403) 652-5111
Website: www.afac.ab.ca
Farm and Food Care Canada
Website: www.farmfoodcare.org
Farm and Food Care Ontario
Phone: (519) 837-1326
Website: www.farmfoodcareon.org
Farm and Food Care Prince Edward Island
Phone: (902) 368-7289
Website: www.farmfoodcarepei.com/
Farm and Food Care Saskatchewan
Phone: (306) 477-3663
Website: www.farmfoodcaresk.org

Resources for Further Information (continued)

Government

Alberta Agriculture and Forestry
Website: www.agric.gov.ab.ca
Agriculture and Agri-Food Canada
Website: www.agr.gc.ca
British Columbia Ministry of Agriculture
Website: www.gov.bc.ca/agri
Canadian Food Inspection Agency
Website: inspection.canada.ca/eng/1297964599443/1297965645317
Manitoba Agriculture, Food and Rural Initiatives
Website: www.gov.mb.ca/agriculture
New Brunswick Ministry of Agriculture, Aquaculture and Fisheries
Website: www2.gnb.ca/content/gnb/en/departments/10.html
Newfoundland and Labrador Department of Department of Fisheries, Forestry and Agriculture – Agrifoods
Website: www.gov.nl.ca/ffa/
Nova Scotia Department of Agriculture and Marketing
Website: www.gov.ns.ca/agri
Ontario Ministry of Agriculture and Food
Website: www.omafra.gov.on.ca
Prince Edward Island Ministry of Agriculture and Forestry
Website: www.gov.pe.ca/af
Québec Agriculture, Pécheries et Alimentation
Website: www.mapaq.gouv.qc.ca
Saskatchewan Ministry of Agriculture
Website: www.saskatchewan.ca/agriculture
Veterinary Drugs Directorate (Health Canada)
Website: www.canada.ca/en/health-canada/corporate/about-health-canada/branches-agencies/health-products-food-branch/veterinary-drugs-directorate.html

Agriculture Colleges and Universities

Dalhousie University – Faculty of Agriculture – Bible Hill, NS
Website: www.dal.ca/faculty/agriculture.html
Lakeland College – Vermilion, AB
Website: www.lakelandcollege.ca
Laval University – Faculté des sciences de l'agriculture et de l'alimentation – Québec, QC
Website: www.fsaa.ulaval.ca
McGill University – Faculty of Agricultural and Environmental Sciences – Montreal, QC
Website: www.mcgill.ca/macdonald
Olds College – Olds, AB
Website: www.oldscollege.ca
Ontario Agricultural College, University of Guelph – Guelph, ON
Website: www.uoguelph.ca/oac
University of Alberta – Faculty of Agricultural, Life and Environmental Sciences – Edmonton, AB
Website: www.ales.ualberta.ca

Resources for Further Information (continued)

University of British Columbia – Faculty of Land and Food Systems – Vancouver, BC
Website: www.landfood.ubc.ca
University of Manitoba – Faculty of Agricultural and Food Sciences – Winnipeg, MB
Website: www.umanitoba.ca/afs
University of Saskatchewan, Agriculture and Bioresources College, University of Saskatchewan – Saskatoon, SK
Website: www.agbio.usask.ca

Colleges of Veterinary Medicine

Atlantic Veterinary College, University of Prince Edward Island – Charlottetown, PEI
Website: www.upei.ca/avc

Faculté de médecine vétérinaire, Université de Montréal – Montréal, QC
Website : www.medvet.umontreal.ca
Faculty of Veterinary Medicine, University of Calgary – Calgary, AB
Website: www.vet.ucalgary.ca
Ontario Veterinary College, University of Guelph – Guelph, ON
Website: www.ovc.uoguelph.ca
Western College of Veterinary Medicine, University of Saskatchewan – Saskatoon, SK
Website: www.usask.ca/wcvm

Animal Welfare Organizations

Alberta Society for the Prevention of Cruelty to Animals
Phone: (780) 447-3600
Website: www.albertaspca.org
Animal Protection Services of Saskatchewan
Phone: (306) 382-0002
Website: www.animalprotectionservices.ca
British Columbia Society for the Prevention of Cruelty to Animals
Phone: (604) 681-7271
Website: www.spca.bc.ca
Humane Canada
Phone: (613) 224-8072
Website: www.humanecanada.ca
New Brunswick Society for the Prevention of Cruelty to Animals
Phone: (506) 458-8208
Website: www.spca-nb.ca
Nova Scotia Society for the Prevention of Cruelty to Animals
Phone: (902) 835-4798
Website: www.spcans.ca
Ontario Society for the Prevention of Cruelty to Animals
Phone: (905) 898-7122
Website: www.ontariospca.ca

Resources for Further Information (continued)

Veterinary Associations

Canadian Association of Bovine Veterinarians
Phone: (306) 956-3543
Website: www.cabv.ca

Canadian Small Ruminant Veterinarians
Website: www.facebook.com/CSRVVPRC

Canadian Veterinary Medical Association
Phone: (613) 236-1162
Website: www.canadianveterinarians.net/

L'Association des Médecins Vétérinaires Praticiens du Québec
Phone : (418) 651-0477
Website: www.amvpq.org

Ontario Association of Bovine Practitioners
Website: www.oabp.ca

Western Canadian Association of Bovine Practitioners
Phone: (866) 269-8387
Website: www.wcabp.com

Other

Animal Health Canada
Website: animalhealthcanada.ca

Canadian Cattle Identification Agency (CCIA)
Phone: (877) 909-2333
Website: www.canadaid.com

Canadian Livestock Transport (CLT)
Phone: (519) 829-2242
Website: www.livestocktransport.ca

World Organisation for Animal Health (WOAH, founded as OIE)
Website: www.woah.org

Works Consulted

The following resources were consulted during the development of this Code. They may also be of interest to those seeking additional information:

Standards and comprehensive resources

A Greener World. Dairy goat standards. 2018. www.agreenerworld.org/certifications/animal-welfare-approved/standards/dairy-goat-standards/

Animal Health Australia and Goat Industry Council of Australia. Australian Industry Standards and Guidelines for Goats. 2019. www.animalwelfarestandards.net.au/goat/

American Society of Animal Science. Guide for the care and use of agricultural animals in research and teaching. 2010. www.asas.org/ag_guide_3rded/HTML5/index.html

Animal Welfare Victoria. Code of Accepted Farming Practice for the Welfare of Goats. 2022. www.agriculture.vic.gov.au/livestock-and-animals/animal-welfare-victoria/pocta-act-1986/victorian-codes-of-practice-for-animal-welfare/code-of-accepted-farming-practice-for-the-welfare-of-goats

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Canadian Council on Animal Care (CCAC). CCAC guidelines on: the care and use of farm animals in research, teaching and testing. 2009. www.ccac.ca/Documents/Standards/Guidelines/Farm_Animals.pdf

Global Animal Partnership. Goat Standards. 2020. www.globalanimalpartnership.org/standards/goat/

Hedrich, C. Best management practices for dairy goat farmers. 2008. www.smallruminants.ces.ncsu.edu/wp-content/uploads/2017/06/Bestmanagementpracticesfordairygoatfarmers.pdf?fwd=no

Humane Farm Animal Care. Standards for production of goats. 2013. www.certifiedhumane.org/wp-content/uploads/Std13.Goat_.2A-2.pdf

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Manitoba Goat Association. Goat Welfare. N.d. www.gov.mb.ca/agriculture/livestock/goat/pubs/goat-welfare.pdf

NFACC. Code of practice for the care and handling of bison. 2017. www.nfacc.ca/pdfs/codes/bison_code_of_practice.pdf.

NFACC. Code of practice for the care and handling of goats. 2003. www.nfacc.ca/codes-of-practice/goats

NFACC. Code of practice for the care and handling of pigs. 2014. www.nfacc.ca/pdfs/codes/pig_code_of_practice.pdf.

NFACC. Code of practice for the care and handling of sheep. 2013. www.nfacc.ca/pdfs/codes/sheep_code_of_practice.pdf.

NFACC. Code of practice for the care and handling of veal cattle. 2017. www.nfacc.ca/pdfs/codes/veal_cattle_code_of_practice.pdf.

Nova Scotia Department of Agriculture. Goat production manual. N.d. www.novascotia.ca/thinkfarm/documents/Manual-Goat.pdf

Ontario Goat. Best management practices for commercial goat production. 2014. www.ontariogoat.ca/best-management-practices-manual/

Ontario Ministry of Agriculture, Food and Rural Affairs. Dairy goats. www.omafra.gov.on.ca/english/livestock/goat/dairy_goats.html

Ontario Ministry of Agriculture, Food and Rural Affairs. Dairy goat farm production requirements. www.omafra.gov.on.ca/english/food/inspection/dairy/page-1.htm

PennState Extension. Meat Goat Production and Management Home Study Course. N.d. www.extension.psu.edu/programs/courses/meat-goat

The Ohio State University. Goat resource handbook. 2016. www.extensionpubs.osu.edu/goat-resource-handbook/

Popular literature/books

Amundson, C. How to raise goats. 2009. www.amazon.com/How-Raise-Goats-Carol-Amundson/dp/076033157X/ref=sr_1_9?dchild=1&keywords=goat+management&qid=1595969165&sr=8-9

Australian Livestock Export Corporation (LiveCorp) and Meat & Livestock Australia. Veterinary handbook for cattle, sheep and goats. 2020. www.veterinaryhandbook.com.au/ContentSection.aspx?id=1

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Belanger, J. and Thomson Bredesen, S. Storey's Guide to Raising Dairy Goats, 5th Edition: Breed Selection, Feeding, Fencing, Health Care, Dairying, Marketing. 2018. www.amazon.com/Storeys-Guide-Raising-Dairy-Goats/dp/1612129323/ref=sr_1_29?dchild=1&keywords=goat+management&qid=1595969819&sr=8-29

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Harwood, D. and Mueller, K. Goat medicine and surgery. 2018. www.routledge.com/Goat-Medicine-and-Surgery/Harwood-Mueller/p/book/9781498748636

Humphrey, M.L. Annie's All About Goats: Essential Goat Care. 2015. www.amazon.com/Annies-All-About-Goats-Essential/dp/0692480188/ref=sr_1_13?dchild=1&keywords=goat+management&qid=1595969243&sr=8-13

McCullough, F. Housing, bedding, fencing, exercise yards and pasture management guide. 2012. www.amazon.ca/Housing-Bedding-Fencing-Exercise-Management/dp/1781650411

McCullough, F. Managing Goat Nutrition: What You Need to Know a Simple Guide. 2012. www.amazon.ca/Managing-Goat-Nutrition-Simple-Guide/dp/1475063024/ref=sr_1_1?crid=1S03Z5YCI43YR&keywords=Managing+goat+nutrition%3A+What+you+need+to+know+a+simple+guide.&qid=1655486963&s=books&sprefix=managing+goat+nutrition+what+you+need+to+know+a+simple+guide+%2Cstripbooks%2C91&sr=1-1

Niemann, D. Raising Goats Naturally, 2nd Edition: The Complete Guide to Milk, Meat, and More. 2018. www.amazon.com/Raising-Goats-Naturally-2nd-Complete-ebook/dp/B07FDN5FK5/ref=sr_1_15?dchild=1&keywords=goat+management&qid=1595969355&sr=8-15

Smith, C.K. Raising goats for dummies. 2010. www.amazon.com/Raising-Goats-Dummies-Cheryl-Smith/dp/0470568992/ref=pd_rhf_dp_s_pd_crcd_1_1/144-6765980-5442223?_encoding=UTF8&pd_rd_i=0470568992&pd_rd_r=4db1dd13-e18f-4946-98af-befa049c9eff&pd_rd_w=RnvHA&pd_rd_wg=Ks5Di&pf_rd_p=a9b07153-0c21-4525-9d4a-94428cee590f&pf_rd_r=EFNANNYWK32GPVZK19P0&psc=1&refRID=EFNANNYWK32GPVZK19P0

Van Der Noot, G.W. Dairy Goats – With Information on the Breeds, Breeding and Management of Dairy Goats. 2015. www.amazon.com/Dairy-Goats-Information-Breeding-Management/dp/1446529924/ref=sr_1_31?dchild=1&keywords=goat+management&qid=1595969944&refinements=p_72%3A1250221011&rnid=1250219011&s=books&sr=1-31

Sub-sections:

a) Housing/Accommodations

British Columbia Ministry of Agriculture. Commonly used wire for agricultural fences. 2015. www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/farm-management/structures-and-mechanization/300-series/307100-1_commonly_used_wire_for_agric_fences.pdf

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NC State Extension. Housing and facilities for meat goats. 2015. www.content.ces.ncsu.edu/housing-and-facilities-for-meat-goats

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Ontario Ministry of Agriculture, Food and Rural Affairs. Planning and building a goat milk house. 2020. www.ontario.ca/page/planning-and-building-goat-milk-house

Purdue University. Housing for dairy goats. N.d. www.ansc.purdue.edu/goat/factsheet/housing.htm

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Summary of Code Requirements

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

SECTION 1 Roles and Responsibilities

- Personnel working with goats must have ready access to a copy of this Code of Practice, be familiar with, and comply with the Requirements as stated in this Code.
- Producers must ensure that personnel involved in the care and management of goats are knowledgeable, skilled, trained, competent, and supervised.

SECTION 2 Housing and Handling Facilities

- Goats must have access to shelter.
- Goat shelters or buildings, either natural or manufactured, must mitigate the harmful effects of rain, wind, and extreme cold and heat.
- Goat housing, including shelters, must keep goats clean and dry.
- Building materials with which goats come into contact must not contain harmful compounds.

2.1.1 Temperature

- For the first week of life kids must be protected from wind chills and drafty, cold conditions.
- Stockpeople must be able to recognize and promptly assist goats displaying signs of heat or cold stress.

2.1.2 Ventilation and Air Quality

- Goat housing must have ventilation (natural or mechanical) to bring in fresh air and exhaust humidity and manure gases.
- Condensation visible on surfaces or in the air requires corrective action.
- Corrective actions must be taken if ammonia is either detected by smell or if levels are more than 25 ppm.

2.1.3 Lighting

- Goats must have sufficient light to facilitate care and observation.
- Artificial lighting must be added to buildings with low natural light.
- An appropriate period of rest from artificial lighting (at a minimum, 6 hours) must be provided to allow goats to maintain their natural photoperiod.
- All electric wires and fittings must be well out of reach of goats and well protected (29).

2.2.1 Pen Design

- Fences, gates, penning, and feeders must be designed to prevent accidental entrapment.
- All penning must be maintained and repaired or replaced as needed.
- Barriers, pen dividers, or other penning or handling structures must have no sharp edges or protrusions that might injure goats (32).
- Pens must be available to separate and treat goats.

2.2.2 Floor Space Allowance in Pens

- Goats must be housed in groups and have enough space to turn around, lie down, stretch-out when lying down, get up, rest, and groom themselves comfortably at all ages and stages of production (44).
- If overcrowding behaviours are observed, action must be promptly taken to reduce stocking density.

Summary of Code Requirements (continued)

2.3 Flooring

- Flooring must be designed and maintained to minimize slipping and injury (11).
- Slatted floors must be maintained to prevent goats from becoming damp, cold, injured, or entrapped; drafts and ammonia levels must be minimized to reduce adverse health effects.

2.4 Feeder Design

- Limit-fed goats must all be able to access feed at the same time.
- Feeders must be designed and maintained to prevent goats from becoming injured or accidentally entrapped.
- Feeders must be cleaned when contamination (e.g., feces, spoiled feed) is observed in the feeders.
- Feeders must be checked daily.

2.5 Watering Systems

- Watering systems must be monitored daily to ensure that safe, clean, and palatable water is always available.
- Waterers must be designed and positioned to minimize contamination (e.g., fecal matter, feed).
- Waterers must be cleaned whenever contaminated (e.g., algae, organic material).
- All electrical watering devices must be properly grounded and maintained to prevent shocks.
- Waterers accessible by kids must be sized, positioned, and protected to prevent drowning.
- Producers must have a plan to supply water in an emergency (i.e., power failure, drought).

2.6 Handling Systems

- Handling equipment or method of restraint must not cause injury or unnecessary stress to goats.

2.7 Enrichment

- Provide goats with at least one form of enrichment.

2.8 Bedding and Manure Management

- Bedding must be provided in all buildings housing goats (except systems using slatted floors) to create a clean, comfortable, and dry surface.
- In cold temperatures, extra bedding must be provided.
- Manure and waste must be stored in a manner to:
  - avoid run-off seeping into goat housing areas
  - prevent contamination of water sources and feed
  - prevent attracting scavengers to housing areas.

2.9.1 Fencing

- There must be no sharp edges or protrusions (e.g., tail-end of the barbed wire) in fencing or in pasture that could injure goats.
- Fencing must be monitored daily for entrapped goats and corrective action taken as needed.
- If entrapment or injury is a recurring problem, stockpeople must investigate and repair.

2.10 Milking Parlours

- Parlour areas must be free of protrusions or sharp edges that could injure goats.
- Pens, ramps, milking parlours, and milking machines must be suitable for goats and be inspected and maintained to prevent injury, disease, and distress.
- Gates and restraining devices of milking stalls must operate smoothly and safely.

Summary of Code Requirements (continued)

SECTION 3 Emergency Preparedness and Management

3.1 Emergency Prevention and Preparedness

- An emergency telephone list must be readily available for the producer, stockpeople, and emergency crews. Refer to *Appendix B – Emergency Telephone List*.
- Farm-specific procedures must be prepared for emergencies such as fires, equipment or power failures, and extreme weather events. The procedures must be written and communicated to stockpeople and family members.
- A map of the barn and its surroundings must be drawn and kept readily accessible for emergency crews. Refer to *Appendix C – Mapping Barns and Surrounding Areas for Fire Services*.
- Emergency plans must include specific actions and those designated to conduct specific actions.
- Plans must be easily accessible at the onset of an emergency.
- Plans must ensure that the welfare of the animals is maintained in any potential emergency event.

3.1.1 Fire in Farm Buildings

- All electrical connections to equipment must be hard-wired. Extension cords must only be used temporarily and unplugged when not in use.
- All electric wiring, outlets, and fixtures (e.g., heat lamps) must be out of reach of livestock.
- Fire extinguishers must be available and maintained according to manufacturer's instructions. Stockpeople must know where they are located and must be competent in their use.
- When in use, heat lamps and infra-red heaters must be kept at a safe distance from combustible materials, including bedding.
- Heat lamps must have a guard and must be suspended using non-combustible materials (62).

3.1.3 Power/Mechanical Failure

- If the systems cannot be run manually, an alternative method or power source must be available to run critical systems (e.g., watering system, ventilation, milking, feeding).
- Producers must have enough feed and safe, clean, and palatable water to meet the needs of their goats for at least 72 hours.
- All electrical and mechanical equipment and services including water bowls and troughs, ventilating fans, heating and lighting units, milking machines, and alarm systems must be inspected at least annually and kept in good working order.

3.1.5 Catastrophic Animal Losses

- All farms where euthanasia is performed by anyone other than the owner/primary producer must have a written Euthanasia Action Plan that indicates appropriate methods, landmarks, and secondary steps when using a captive bolt.

SECTION 4 Feeding and Water

4.1.1 Managing Feeding and Nutrition

- Feed (including forage, pasture, and/or grain ration) must be accessible and available every day.
- Feed provided must meet nutritional needs of goats appropriate for species, age, size, and stage and level of production.
- Sufficient fibre must be provided in the ration to promote rumination (cud chewing).
- Ration changes must be made gradually to allow acclimation of the rumen microflora.

Summary of Code Requirements (continued)

4.1.2 Managing Feeding and Body Condition

- Body condition must be routinely monitored.
- Corrective action must be taken if body condition score falls below 2 or above 4 (out of 5).

4.1.3 Managing Feed Quality

- Feed must be handled, stored, and fed to maintain quality and minimize spoilage.
- Feed contaminated with visible mold, spoilage, soil, or fecal material must not be fed to goats.
- Stockpeople must be able to recognize signs of disease that could be related to poor feed quality.
- Reasonable steps must be taken to prevent exposure to toxins (e.g., poisonous plants, moldy or spoiled feed, toxic construction materials, antifreeze, lead, and pesticides).

4.2.1 Colostrum Management for Dam-Raised Kids

- Newborn kids must receive their first colostrum feeding as soon as possible (within the first 2 hours is best) and no later than 6 hours after birth.
- A supply of good quality colostrum or colostrum replacer must be available to supplement newborn kids in a timely manner.

4.2.2 Colostrum Management for Artificially-Raised Kids

- Newborn kids must receive their first colostrum feeding as soon as possible (within the first 2 hours is best) and no later than 6 hours after birth.
- A newborn kid must be fed a minimum of 20% of its birthweight in colostrum in the first 24 hours (e.g., 600 mL for 3 kg kid divided into at least 3 feedings).
- If not fed immediately, colostrum must be covered and chilled after collection to minimize bacterial growth.
- Colostrum must not be left at room temperature.
- Colostrum must not be thawed or heated using a microwave.
- All colostrum equipment must be cleaned, sanitized, and dried after each use.
- Each farm must have a stockperson competent in the proper method of tube feeding a newborn kid.

4.3 Raising Kids on Milk or Milk Replacer

- Milk replacer powder must be well mixed to stay in solution, mixed at correct concentration, and deliver consistent nutrition to all kids in the group.
- Kids must receive a volume and quality of milk or milk replacer that promotes health, growth, and vigour (32).
- Milk and milk replacer must be kept fresh and not allowed to spoil.
- Milk feeding equipment and utensils must be cleaned and sanitized after each use to reduce bacterial growth.
- Automated milk feeders must be cleaned and sanitized as needed to maintain a sanitary feeding system.

4.4 Weaning

- Does nursing kids (especially multiples) must receive adequate nutrition to produce sufficient milk to sustain their kids until weaning.
- Dry feed or forage must be provided to artificially-raised kids starting at one week of age to promote rumen development.
- Before weaning, kids must be consuming adequate amounts of forage, solid feed, and water daily to maintain growth and health.
- Kids must not be weaned from milk before 6 weeks of age (69).

Summary of Code Requirements (continued)

4.5 Grazing and Pasturing Areas

- Available pasture and/or browse must meet dietary needs.
- The ration must be supplemented if there is insufficient forage quantity or quality to meet dietary needs or is inaccessible due to snow or ice cover.
- Feed volumes/rations must be increased in extreme cold weather to allow for higher energy demands.
- Stockpeople must ensure that pregnant does are able to meet dietary requirements necessary to support late gestation needs.
- Application of fertilizers, pesticides, and herbicides onto pasture must be timed to prevent risk to animals (31).

4.6 Feeding to Prevent Common Metabolic and Nutrition-Related Diseases

- Controlling the risk of metabolic and nutrition-related diseases must be considered when formulating diets and feeding rations.
- Feed and feeding management must be amended quickly when metabolic and nutritional diseases are identified.

4.7 Drinking Water

- All goats, including kids, must always have access to sufficient quantities of safe, clean, and palatable water.
- Snow and ice are not acceptable as sole sources of water for goats.

SECTION 5 Husbandry Practices

5.1.1 Catching and Restraining

- All stockpeople must understand goat behaviour and be competent in goat handling techniques.
- Stockpeople must work calmly and quietly with goats at all times using the minimum force necessary.
- All methods of restraint must allow for the quick release of the goat(s).
- Goats must be handled at all times so as to minimize the risk of pain, injury, or distress.
- Goats must not be subjected to mistreatment (including kicking, hitting, or tail twisting).
- Electric prods must never be used.
- Goats must not be left unattended while restrained.

5.1.3 Herding and Livestock Guardian Dogs

- Herding and livestock guardian dogs must not stress goats (e.g., by chasing, playing with, or biting).
- Dogs must not have access to goats unless under the control of a stockperson (with the exception of trained and acclimated livestock guardian dogs; 32).

5.2 Yokes, Horn Bars, and Tethering Devices

- Yokes and horn bars must not cause pain, injury, or distress.
- Animals must not wear a yoke or horn bar on a permanent basis.
- Yokes and horn bars must always allow goats to access food and water.
- Tethering devices must not cause pain, injury, or distress.
- Animals must not be tethered continuously.
- Goats must be directly supervised when tethered.

Summary of Code Requirements (continued)

- Goats that are restrained by tethering must also be:
  - calm and trained to the conditions
  - provided with access to palatable water, sufficient feed, and access to shelter
  - able to walk and move around without becoming entangled or entrapped.
- Goats must not be tethered if sick, compromised, pregnant, or nursing (78).

5.3 Social Environment

- Goats in individual pens must be able to see and/or hear other goats or companions.
- Goats must be monitored for, and prompt action taken when bullying, injuries, and drop in feed intake or body condition scores are observed.

5.4 Predation Control

- Producers must implement a strategy to minimize predation risk suitable for their farm, animals, and the predator(s) being considered.
- Producers must provide prompt and appropriate care for goats that have been attacked by predators (refer to *Section 6 – Health Management* and *Section 8 – Euthanasia and On-farm Slaughter*).

5.5 Identification

- Animal identification must be in compliance with current government regulations.
- Stockpeople must ensure that all identification materials are suitable for goats.
- Goat identification must be performed or supervised by a competent stockperson.
- Stockpeople must use application equipment that is in good working order and maintained according to manufacturer's instructions.
- Stockpeople must employ proper hygiene practices to reduce potential infections and ensure that infected tagging sites or tears are properly treated.
- When using ear or tail web tags, stockpeople must:
  - use a tag suitable for the age, size, and breed of goat
  - use 2 tags maximum per ear
  - ensure the tag is positioned correctly to avoid excess bleeding or catching on objects.
- Branding goats must not be practiced.
- Ear notching must not be practiced.

5.6 Hoof Trimming

- Hooves must be inspected regularly (minimum every 6 months) and trimmed as required to maintain hoof health and goat well-being (refer to *Appendix H – Properly Trimmed and Overgrown Hooves*).
- Hoof trimming must be performed by, or under the supervision of, competent stockpersons.
- Stockpeople must have the ability to identify signs of overgrown hooves, foot rot, and other diseases.
- Trimming equipment must be clean and well maintained.
- Equipment must be disinfected between animals after use on diseased feet or hooves.

5.7 Castration

- A decision to castrate must be based on a welfare risk-benefit analysis rather than routine.
- Producers must work with their veterinarian to develop practical, safe, and effective protocols for reducing pain resulting from castration.
- Castration must only be done by a competent person after training with a veterinarian or other competent person.

Summary of Code Requirements (continued)

- If using a local anesthetic, it must only be administered by a competent person after training by a veterinarian.
- Pain control (analgesia), such as NSAIDs, must be provided at the time of castration.
- Castration of bucks beyond 12 weeks of age must be performed by a veterinarian using anesthesia and perioperative analgesia.
- All castrations must meet the method, age range, and pain control use Requirements stipulated in Table 5.1 below:

Table 5.1 – Method, Age Range, and Pain Control Requirements for Castration

Method	Age Range	Mode of pain control required
Rubber ring and clamp	24 hours–10 days	Analgesia
Rubber ring	24 hours–10 days	Analgesia
Rubber ring	11–14 days	Local anesthesia and analgesia required
Clamp castration/ Emasculatome (e.g., Burdizzo)*	Age of the kid may vary by breed and animal when this procedure is suitable Older than 12 weeks of age, to be completed by vet	Local anesthesia and analgesia required
Surgical – Cut and pull	24 hours–7 days	Local anesthesia and analgesia required
Surgical – Emasculator – veterinary procedure only	Older than 7 days	Local anesthesia and analgesia required

**The size of the scrotum and testes must be large enough to allow proper clamp and crush of the spermatic cords without crossing the middle of the scrotal neck. Scrotum and clamp size must be appropriate to perform procedure correctly.*

- Producers must monitor for signs of post-operative complications, consult with their veterinarian, and take appropriate corrective action if needed.

5.8 Disbudding

- Disbudding must only be done by a competent person after training with a veterinarian or other competent person.
- Pain control (analgesia), such as an NSAID, must be provided at the time of disbudding.
- If using a local anesthetic, it must only be provided by a competent person after training by a veterinarian.
- Disbudding must only be performed on kids whose horn buds have not attached to the skull, usually between the ages of 7 to 14 days, and not more than 21 days of age.
- After disbudding, kids must be observed for several days for signs of illness or pain such as decreased milk intake, decreased activity, hunched posture, and a lack of interest in the environment.
- Hot iron disbudding is the only acceptable method of disbudding goats. Caustic paste and clove oil must not be used.

Summary of Code Requirements (continued)

5.9 Dehorning

- Dehorning must not be performed unless necessary to protect the health and welfare of the goat and must be performed by a licensed veterinarian using a sedative, general or local anesthesia, and perioperative analgesia, regardless of age (41).
- Horned goats or goats with scurs must be monitored to ensure that no part of the horn/scur is in contact with the body or face (32).
- Minor horn trimming ("tipping") must be performed by a competent person, making sure to avoid sensitive internal tissue.
- Dehorning using banding, gougers, Barnes dehorner, or Keystone dehorner (i.e., guillotine) is prohibited.
- Dehorned goats must be observed several times in the first 24 hours for excessive bleeding, and daily for infection until healed.
- Broken horns with excessive bleeding or signs of infection must receive immediate veterinary attention.

5.10 Other Management Practices

- Removal of extra teats must be done at as early an age as possible and must only be performed after training by a veterinarian or by a competent person using proper technique and well-maintained sanitary equipment.
- Pain control must be provided in consultation with a veterinarian.

5.10.1 Breeding

- Producers must plan breeding such that appropriate supervision and shelter at kidding will be available.
- Bucks must be managed by taking into account the risk of aggressive behaviour to avoid possible injury to other bucks and stockpeople.
- Doelings must be a minimum of 65% of their breed's expected adult weight at time of breeding.
- The body size and weight of bucks used in natural breeding must be appropriate to the size of the does.
- Semen collection and transcervical artificial insemination must be conducted by a competent stockperson.
- Electroejaculation, when performed, must be done by a licensed veterinarian.
- Laparoscopic artificial insemination or embryo collection and transfer must be done by a licensed veterinarian.
- Kidding must be frequently observed, and timely action taken as required, while keeping disruptions and disturbances to a minimum.
- All stockpeople must be able to recognize the signs of kidding difficulty and know when and how to provide appropriate assistance and when to seek assistance from a competent person or veterinarian.
- Hands must be washed or new gloves must be worn when kidding assistance is required.
- When goats are housed indoors, a clean dry bedded area for kidding must be provided.
- A clean dry area must be provided for does kidding on pasture, with food and water readily available, so does will remain with the newborn kids.
- Newborns that do not nurse voluntarily must be provided the first colostrum feeding as soon as possible – first 2 hours of life is best.
- Newborn kids must be monitored no less than 4 times per day, for evidence that they have suckled and for signs of starvation, hypothermia, and frostbite. Prompt, appropriate corrective action must be taken if problems are observed (32).
- Continual restraint of a doe for the purposes of fostering must not be practiced.

Summary of Code Requirements (continued)

5.10.2 Milking Procedures

- Pens, ramps, milking parlours, and milking machines must be suitable for goats and be inspected and maintained to prevent injury, disease, and distress.
- Procedures must be in place to prevent mastitis.
- All applicable regulations pertaining to milking hygiene must be practiced.
- Milking must be frequent enough to prevent pain due to mammary engorgement.
- All stockpeople milking does must be competent or under direct supervision of a competent milker.
- Does must not be dried off by limiting access to water.
- Does must not be dried off by removing access to feed.

5.10.3 Fibre Management

- All Angora goats must be shorn at least once a year and more frequently around the genitals and face.
- Shearing must be performed by, or under the supervision of, a competent, experienced shearer.
- Shearing of pregnant does in the last month of gestation must only be performed by a competent, experienced shearer.
- All shearing-related injuries must be attended to promptly. Major injuries, (e.g., severed milk vein) must receive first aid and be attended to by a veterinarian.
- Farms must have a sheltered, suitable area that can be used for shearing. Shearing areas must be adequate in size, clean, and well-lit.
- All shearing equipment and any clothing that moves between farms with the shearer must be cleaned and disinfected between herds at a minimum. If there is a known disease transfer risk between animals, all equipment must be disinfected between animals within a herd.
- When planning shearing, producers must consider the time of year, expected weather, and available shelter. Steps must be taken to prevent negative outcomes associated with shearing (e.g., hypothermia, sunburn).
- Goats must not be sheared in cold weather unless appropriate shearing comb lifters are used to leave enough fleece on the body for thermal comfort.
- Provide feed, water, and shelter and/or shade for goats for shearing and afterwards.

SECTION 6 Health Management

6.1.1 Recognizing Injury and Disease in Animals

- Animals must be observed daily.
- Stockpeople must be knowledgeable about goat behaviour and be able to detect abnormal behaviour and signs of injury and illness.
- Stockpeople must be able to identify emergency situations (i.e., animals in need of immediate attention) and take appropriate action.

6.1.2 Managing Sick, Injured, or Cull Animals

- When goats are sick, injured, or suffering, one of the two following actions must be taken without delay:
  1. Treatment—must be safe and may include:
     - pain control
     - veterinary drugs
     - nursing care
     - monitoring for response to treatment.

Summary of Code Requirements (continued)

2. No Treatment—goats must not suffer while waiting to be:
   - culled or sold to slaughter (if suitable for human consumption and transport; refer to *Section 7 – Transport*)
   - slaughtered or euthanized on-farm.
- Written records of disease events and treatment must be kept.
- If treatment is not effective, or will not be provided, an alternative decision must be made immediately.

6.1.3 Herd Health Management and Veterinary Care

- All producers must establish and maintain a working relationship with a licensed veterinarian (VCPR).
- Extra Label Drug Use (ELDU) must be prescribed by a veterinarian.
- Veterinary prescription drugs, including antimicrobials (Category I, II, and III of Medically Important Antimicrobials) must be prescribed and/or dispensed by a licensed veterinarian.
- All veterinary drugs to be used in goats must be safe and:
  - must have a Canadian Drug Identification Number (DIN)
  - must be stored according to label directions
  - must not be used after expiration.

6.1.4 Managing Deadstock

- Deadstock must be removed promptly from areas where livestock are housed or pastured.
- Disposal of deadstock must follow applicable provincial regulations.

6.2.1 Lameness

- Stockpeople must be able to recognize lameness.
- Lame goats must be assessed and action taken without delay.
- When the level of moderate to severe lameness in the herd is high (i.e., ≥5% of animals are lame), the cause must be investigated and corrective action taken.
- Lame goats that are non-ambulatory or are experiencing moderate to severe pain and do not respond to treatment must be euthanized.

6.2.2 Disease Prevention and Control

- If there are unexpected, unexplained, or sudden increases in illness or death losses within the herd, an investigation followed by corrective action must be taken.
- The herd veterinarian must be consulted if investigation and/or corrective action taken fails.

SECTION 7 Transport

7.1 Pre-Transport Decision Making

- Persons handling or transporting goats must comply with Part XII of the *Health of Animals Regulations* (3, 97) and applicable provincial regulations.
- The fitness for transport of every animal must be evaluated within the context of each trip or journey (refer to *Appendix M – Transport Decision Tree*).
- Only healthy, fit animals without injury or illness can be shipped to assembly centres, breeding stock sales, or livestock sales.
- Compromised animals must not be sent to assembly centres (e.g., livestock auction markets or collection yards) and if transported for slaughter must go directly to the closest provincial or federal abattoir.
- Unfit animals must not be transported except for veterinary care on the advice of a veterinarian.

Summary of Code Requirements (continued)

7.2 Pre-Transport Preparation

- Pre-Trip Planning
  - people arranging transport must ensure that locations receiving goats are expecting them and are equipped with personnel and facilities required to meet the animals' needs upon arrival
  - the potential duration of a journey, including stops prior to the final destination, must be considered when evaluating fitness for transport
  - nursing kids accompanying their dams must be allowed an opportunity to nurse undisturbed at suitable intervals while waiting for loading, after loading, and during transport.
- Must Not Transport
  - animals believed or suspected of being in late gestation (e.g., expected to give birth within 15 days) must not be transported (unless for short distances within farm limits to kidding area with veterinary recommendation and oversight), except under the advice of a veterinarian
  - animals must not be shipped within 48 hours after giving birth except under the advice of a veterinarian
  - kids 8 days of age or less must not be transported to assembly centres (e.g., livestock auction markets).
- Pre-Loading
  - the required assessment of animal fitness and records (e.g., livestock manifests, emergency contact information, date/time of last fed/watered/rested) must be completed and provided to the transporter in advance of loading the goats (97)
  - risk factors regarding the animals and the conditions of transport prior to loading must be assessed to prevent animal injury, suffering, or death
  - conveyances must be free of animal by-products such as manure, urine, or soiled bedding prior to loading
  - suitable bedding (e.g., straw, wood shavings, peat moss) must be added to conveyances to assist in absorbing urine and to protect the animals during transport
  - animals must have at least 1 cm (or 2 weeks for fibre producing goats) hair growth to be transported during the cold season unless alternative protection such as coats or heated transport is used
  - compromised animals must be transported with special provisions (such as being isolated, individually loaded/unloaded without having to negotiate ramps inside the conveyance, extra bedding)
  - goats must be separated if they are incompatible by reason of breeding season, sourcing, temperament, sex, weight, age, or horned or health status (with the exception of female animals and their nursing offspring).

7.3 Arranging Transport

- Goats must be transported by competent personnel using safe, well-maintained conveyances and equipment.
- Conveyances and containers used to transport goats must be in compliance with federal and provincial regulatory requirements.
- Containers, if used, must be secured to conveyances to prevent movement during transit.
- Conveyances and containers must be constructed to provide goats with adequate ventilation at all times.
- Ventilation and air temperature within the conveyances must be adjusted to meet the animals' needs.
- Goats must be protected from snow, rain, frostbite, and loss of body heat during transport.
- Goats must be protected from direct contact with the conveyance's cold metal surfaces by lining the floor with dry bedding or other suitable insulating material while ensuring adequate ventilation.

Summary of Code Requirements (continued)

7.4 Loading and Receiving On-Farm

- Handling
  - all Requirements in the Handling section (refer to *Section 5 – Husbandry Practices*) of this Code must be applied
  - instances of inhumane handling or transport must be documented and immediately reported to proper authorities (e.g., Provincial Animal Welfare Authority, local CFIA)
  - the right of the transporter to refuse to load goats that they deem unfit for transport must be respected. The reason for refusal must be addressed
  - personnel in charge of transporting goats must demonstrate knowledge and competence in low stress handling of goats when loading, unloading, and while in transit
  - goats must be loaded calmly, quietly, and patiently using equipment suitable for goats.
- Equipment and Loading
  - trucks must be in good repair, clean, and adequately bedded
  - ramps used for loading/unloading must be able to bear the weight of the animals, have side barriers that inhibit jumping, have secure footing, be placed with no gap between the ramp and vehicle, and have a slope that does not exceed 35 degrees
  - goats must be able to stand at all times with all feet on the floor, head elevated with sufficient space to permit a full range of head movement, and without any part of its body coming into contact with a deck, roof, or top of the conveyance or container
  - when loading, goats must have a clear path to move forward, and are not be rushed or overcrowded (consider the appropriate loading densities and the factors that influence densities such as weather, hair length, horns, length of journey)
  - special measures must be taken when transporting does in peak lactation[1]. They must be transported with their young or milked in a manner and frequency that prevents udder engorgement (e.g., goats in high lactation sold for culling in an assembly center must be dried off).
- Care upon Arrival
  - if euthanasia is required, goats must not be dragged from the conveyance while conscious; they must be humanely stunned or euthanized without being removed from the conveyance and confirmed unconscious before unloading. Actions to assure death after removal from the conveyance must be taken (refer to *Section 8 – Euthanasia and On-Farm Slaughter*)
  - goats must be provided feed, water, and rest immediately upon arrival (refer to *Section 4 – Feed and Water*)
  - prompt additional care must be provided to goats showing signs of heat or cold stress, illness, or injury on arrival (Table 7.1).

SECTION 8 Euthanasia and On-Farm Slaughter

8.1 On-Farm Euthanasia Plans

- Every farm must (i) identify which approved methods of euthanasia they use (including correct landmarks and techniques; see Table 8.1) and (ii) review this with the herd veterinarian.
- All farms where euthanasia is performed by anyone other than the owner/primary producer must have a written Euthanasia Action Plan that indicate appropriate methods, landmarks, and secondary steps when using a captive bolt.
- Personnel performing or supervising euthanasia must have been trained by a competent person on how to appropriately handle and euthanize goats humanely.

1 CFIA infographic *Transport of lactating animals* www.inspection.canada.ca/animal-health/humane-transport/transport-of-lactating-animals/eng/1643140920906/1643140921812.

Summary of Code Requirements (continued)

- Every farm must always have at least one person available who is responsible for making euthanasia decisions.
- Personnel and euthanasia equipment must be available at all times such that an animal can be euthanized without delay to prevent unnecessary pain and suffering.
- A decision to euthanize a goat must be made immediately when an animal is ill or injured and suffering pain or distress and:
  - the animal has no reasonable prospect of recovery, or
  - treatment cannot or will not be provided, or
  - the animal has been treated but the expected response to treatment has not occurred and further treatment is not warranted.
- If there is any doubt as to how to proceed, a veterinarian must be consulted at an early stage to advise whether treatment is possible or whether euthanasia is required to prevent suffering.

8.2 Acceptable Methods of Euthanasia

- An acceptable method of euthanasia must be used (refer to *Table 8.1 – Methods of Euthanasia* and *Appendix N – Anatomical Landmarks for Euthanasia*).
- Methods not listed in Table 8.1 are unacceptable.
- Placement of firearm or captive bolt must be according to *Appendix N – Anatomical Landmarks for Euthanasia*.
- Manually applied blunt force trauma is not an approved method of euthanasia for goats of any age or size and must not be used.
- The selected euthanasia method must take into consideration the age and size of the goat to be euthanized, as well as the availability of proper equipment, appropriate restraint, and the comfort level and training of the person performing the procedure.
- Before being euthanized, animals must not be dragged, prodded, or made to move if pain or suffering may occur.
- The safest, least stressful method of restraint must be used.
- Equipment necessary for euthanasia, such as firearms or captive bolt devices, must be used, stored, and maintained according to the manufacturer's instructions to ensure proper function.

8.3 Confirmation of Loss of Consciousness and Death

- Goats must be assessed for loss of consciousness immediately after stunning. A goat is considered unconscious when there is:
  - a lack of rhythmic breathing
  - no blink response when the eyeball is touched (corneal reflex)
  - a lack of vocalization
  - the animal does not attempt to rise to its feet or lift its head.
- If any sign of consciousness is observed, animals being euthanized by a firearm or captive bolt device must be shot again immediately.
- Before moving or leaving the animal, monitor to confirm death 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 after loss of consciousness the animal must be shot again, or a secondary step repeated.

Summary of Code Requirements (continued)

- Re-check indicators of death 5 minutes after heartbeat and respiration have ceased to ensure euthanasia was successful.
- Carcass disposal must be in accordance with applicable regulations.

8.5 On-Farm Slaughter

- All applicable federal, provincial, and territorial regulations and guidance must be followed if slaughtering on-farm.
- Persons performing or supervising on-farm slaughter must have the relevant knowledge, experience, and skills to slaughter the goat humanely.
- Goats must be monitored for loss of consciousness and death as in *Section 8.3 – Confirmation of Loss of Consciousness and Death*.
- Death must be confirmed before any dressing procedures are conducted.
- Inverting or hanging goats while they are still conscious is prohibited.

8.5.1 Slaughter Without Stunning

- All applicable federal, provincial, and territorial regulations and guidance must be followed if slaughtering without stunning on-farm.
- Persons performing or supervising on-farm slaughter without stunning must have the relevant knowledge, experience, and skills to perform the ritual cut correctly to achieve death as rapidly as possible.
- If performing on-farm slaughter without stunning, a standard operating procedure for slaughter without stunning must be included in the euthanasia action plan of the farm (refer to *Appendix P – Sample On-farm Euthanasia Action Plan*).
- Requirements from Council of Chief Veterinary Officers "Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning" must be followed (refer to *Appendix R – Standards for Optimizing Animal Welfare Outcomes during Slaughter without Stunning*).