



Canadian Agri-Food Research Council

Conseil de recherches agro-alimentaires du Canada

Recommended code of practice
for the care and handling of farm animals

GOATS

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Printed 2003

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Goats

Coordinated by

Canadian Agri-Food Research Council (CARC)
CARC Canada Committee on Animals
CARC Expert Committee on Animal Welfare and Behaviour
Canadian Federation of Humane Societies

Review Committee

Participants are listed in Appendix M

Financial Contributions

Alberta Agriculture, Food and Rural Development
Agriculture and Agri-Food Canada
Canadian Food Inspection Agency (CFIA)

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Acknowledgments

The Canadian Agri-Food Research Council gratefully acknowledges the many individuals and organizations that contributed their valuable time, views and expertise to the development of this Code of Practice. The development of this Code was made possible only through teamwork and cooperation at the national level.

Preface

The Codes of Practice are nationally developed guidelines for the care and handling of the different species of farm animals. The Codes contain recommendations for housing and management practices for farm animals as well as transportation and processing.

The Codes are voluntary and are intended as an educational tool in the promotion of sound husbandry and welfare practices. The Codes contain recommendations to assist farmers and others in the agriculture and food sector to compare and improve their own management practices. Institutions maintaining research herds should also be in compliance with the relevant Canadian Council on Animal Care (CCAC) Guidelines.

In 1980, the Canadian Federation of Humane Societies began coordinating the process of development of draft Codes of Practice for all livestock species with the introduction of a *Recommended Code of Practice for the Care and Handling of Chickens from Hatchery to Slaughterhouse*. The federal Minister of Agriculture and Agri-Food Canada (AAFC), provided financial support for the undertaking at that time.

All Codes are presently developed by a Review Committee made up of representatives from farm groups, animal welfare groups, veterinarians, animal scientists, federal and provincial governments, related agricultural sectors and interested individuals.

In 1993, Agriculture and Agri-Food Canada asked the Canadian Agri-Food Research Council (CARC) and its Canada Committee on Animals and Expert Committee on Farm Animal Welfare and Behaviour to take the lead in cooperation with the Canadian Federation of Humane Societies in updating existing Codes and developing new commodity Codes. CARC officially agreed to take on this responsibility in February 1995 upon confirmation of funding from Agriculture and Agri-Food Canada.

In 1996, CARC with the support of the provincial governments began producing four page factsheets in both English and French for such uses as teaching agriculture in the classroom, agricultural fairs and exhibitions.

Codes developed to date:

Species	Original	Revision
Poultry	1983	1989
Pullets, Layers, and Spent Fowl	-	2003
Chicken, Turkeys and Breeders	-	2003
Pigs	1984	1993
SEW Addendum	2003	-
Veal Calves	1988	1998
Ranched Mink	1988	-
Ranched Fox	1989	-
Dairy Cattle	1990	-
Beef Cattle	1991	-
Sheep	1995	-
Farmed Deer	1996	-
Horses	1998	-
Bison	2001	-
Transport	2001	-

Further information on the process of Code development can be obtained from the Canadian Agri-Food Research Council (CARC), Heritage House, Building 60, Central Experimental Farm, Ottawa, Ontario K1A 0C6. Requests for copies of the Codes can be addressed to the national commodity group and/or specific provincial organizations.

The CARC Home Page is www.carc-crac.ca for further information.

Disclaimer

Information contained in this publication is subject to periodic review in light of changing goat management practices, government requirements and regulations. No subscriber or reader should act on the basis of any such information without referring to applicable laws and regulations and/or without seeking appropriate professional advice. Although every effort has been made to ensure accuracy, the Review Committee shall not be held responsible for loss or damage caused by errors, omissions, misprints or misinterpretation of the contents hereof. Furthermore, the Review Committee expressly disclaims all and any liability to any person, whether the purchaser of this publication or not, in respect of anything done or omitted, by any such person in reliance on the contents of this publication.

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READERS' COMMENTS AND SUGGESTIONS

The Canadian Agri-Food Research Council would like to receive your comments and suggestions on the Recommended Code of Practice for the Care and Handling of Farm Animals - Goats. Please send the completed questionnaire to the Canadian Agri-Food Research Council at Building 60, Central Experimental Farm, Ottawa, Ontario, K1A 0C6, or fax: (613) 234-2330. Feedback will be considered in future editions.

1. My work involves:
 - a) commercial transportation of farm animals
 - b) raising goats (number)
 - c) animal care/handling at an auction market
 - d) teaching and research
 - e) other (please specify)

2. The goat code is relevant or useful in my work:
 - a) highly
 - b) to some degree
 - c) not

Additional comments:

3. The organization of the code contents:
 - a) is appropriate
 - b) needs improvement (please specify)

4. The topics contained in the code cover all appropriate aspects of goat management:
 - a) yes
 - b) no (please specify)

Introduction

Twelve thousand years ago goats were one of the first species to be domesticated. They provide meat and milk for our nourishment, hides and hair for shelter and clothing, manure to fertilize crops. Found throughout the world, goats are raised in a wide variety of situations and adapted to a broad range of environmental conditions. Their ability to thrive on diverse rations, their adaptability and their unique meat, fibre and digestible milk have added to the quality of life for many people, rich and poor, the world over. These animals have our respect and the right to humane treatment.

This code is voluntary. It is intended to be used by members of industry, scientists and animal welfare groups as an educational tool in the promotion of sound husbandry and welfare practices. It recognizes the basic principles that being humane to animals is a prime consideration and that those animals treated well and protected from stress benefit producers. At the same time, it acknowledges the fact that the usefulness of goats is often based on their ability to produce under many different conditions. It is important to understand their needs and the basic conditions, which are necessary for goats to thrive.

Given the scope of production systems in the Canadian goat industry, strict definition of the wide range of production and management practices used is neither reasonable nor feasible in this code. People who care for goats should make use of the wide body of literature that is available on the subject (see appendix N), and share information with each other on their discoveries and successful goat-keeping strategies. Innovation and improvement of production practices will ensure the flexibility and the survivability of the goat industry, increasing its contribution to our economy.

The recommendations in this code attempt to define principles for good standards of goat production and well being in commercial, research, educational, hobby and other farm operations. As a guideline, this code can serve operators in the various sectors of the goat industry both to compare with others and to improve their own management routines.

As technology develops through research and producers apply new methods to enhance goat production, management practices beneficial to both goats and people will evolve. All participants in the industry are encouraged to make a personal contribution to this ongoing process through their local, provincial and national organizations to assist in future revisions of this code.

Section 1 ◇ Shelter and Facilities

Given the variety of goat production systems, coupled with Canada's diverse climate and geographical conditions, a description of all shelter and facilities for goats is outside the scope of this Code. Instead, the Code provides basic principles. If further details appropriate to the local situation are required, provincial agricultural ministries, universities, colleges, goat producer groups and successful individual goat producers can provide useful information.

1.1 Shelter

- 1.1.1 Goats require proper shelter. Housing should be constructed with reference to the NFBC – National Farm Building Code of Canada and all local codes, by-laws and standard practices as may be interpreted for farm buildings. Shelters should provide dry, well ventilated and clean conditions.
- 1.1.2 Goats require shelter from wind, precipitation and adverse weather conditions. Shelters should be located to avoid adverse natural occurrences. Building materials including preservatives and paints to which the goats have access should not contain any chemical compounds harmful to goats or which may contaminate the products destined for human consumption.
- 1.1.3 Goats need have access to a dry, well-drained area for rest and rumination. This area must be large enough to accommodate all the goats lying down at the same time (see Table 1).
- 1.1.4 Shelter areas and other goat facilities (pens, barns, etc.) should be located to avoid reasonably foreseeable problems such as seasonal flooding and extreme winds and snowfall.

1.2 Fencing

- 1.2.1 Fencing should be designed, installed and maintained to be safe and effective. Fences used to confine horned goats should not allow entrapment (also see 2.4.3).
- 1.2.2 In electric fence systems, electrical energy should be provided by an energizer meeting the standards of the Canadian Standards Association, and installed as recommended by the manufacturer.

1.2.3 Barbed wire can cause severe injury to goats and is not recommended.

1.3 Buildings

1.3.1 Buildings used to house goats should be adequately ventilated by mechanical or natural means, in order to reduce the risk of respiratory diseases and the chilling of young kids, and to contribute to general animal comfort. Effective ventilation will control humidity, condensation, ammonia levels and draughts. Insulation of the walls and ceilings of single story buildings is frequently necessary to avoid condensation. Further information can be obtained from provincial ministries, agricultural colleges and agricultural engineering consultants.

1.3.2 Where natural lighting is not used, artificial lighting is recommended. Lighting for satisfactory inspection of animals and facilities should be available at any time.

1.3.3 Housing design must take into account many considerations, including animal needs, normal goat behaviour, ease of maintenance, sanitation and safety for humans and animals. A goat's basic needs are for food, water, shelter and protection from predators. Feeding systems must reflect the goats' tendency to want to feed at head level or above, recognizing that goats will climb into or onto feeders and other structures and, if not controlled, may contaminate the feed.

1.3.4 All equipment and services should be checked regularly and kept safe and in good working order.

1.3.5 All measures necessary to deal with unforeseen emergencies such as interruption of power supply and fire should be incorporated within each building. Emergency procedures should be posted and updated regularly and should include:

- evacuation procedures (for people and goats)
- important telephone numbers; and
- emergency transportation and housing arrangements.

1.3.6 The installation of a suitable and effective smoke and fire detection system is recommended. A fire extinguisher rated at least 2A by the Underwriters Laboratories of Canada should be available in each building.

1.3.7 Emergency lighting systems are also recommended.

1.3.8 For the safety of goats and producers, storage and disposal of manure should follow provincial and federal requirements.

1.4 Pens and Space Allowances

1.4.1 Goat pens shall provide enough space for all the goats to lie comfortably on a dry or bedded area, sheltered from adverse weather conditions and room to move around easily at will.
(Refer to Table 1)

1.4.2 Pens where goats are kept for short periods, such as handling or holding pens, should provide enough space for all the goats to stand comfortably.

1.4.3 Space allowances for goat pens will vary depending upon animal size, fleece length, presence or absence of horns, lactation status, climate, soil characteristics and production practices. Table 1 provides general guidelines that may need to be adapted to individual requirements.

1.4.4 Pens should be of sturdy construction to contain the goats with partitions extending to the floor and high enough to prevent escape. The design must also be such that goats will not become trapped or injured. Walls, floors and partitions should be free of openings, protrusions or sharp edges that can cause injury or discomfort.

1.4.5 All materials used in pens to which goats have access, including paint and wood preservatives, should not contain any chemical substances known to be harmful to livestock or known to contaminate the meat or milk.

1.4.6 All pens should have suitable access to allow goats to be inspected or moved as necessary.

1.4.7 Shelter should be available to separate and protect injured, orphaned or sick goats where it is appropriate to do so.

1.5 Flooring and Bedding

1.5.1 Flooring must be safe, provide secure footing and be effectively drained. Flooring materials include, but are not limited to soil, gravel, concrete, wood, metal or plastic.

1.5.2 With the exception of slotted floors, absorbent bedding material such as straw, wood shavings or peat moss should be added to interior pens to provide a clean, comfortable, dry surface. If a manure pack system is used, fresh bedding material must be added regularly to keep the surface dry.

Table 1: Guidelines for Space Requirements for Housing Goats

Class of Animal	Building Floor Space		Lot Space			
			Dirt		Paved	
	(ft ² /hd)	(m ² /hd)	(ft ² /hd)	(m ² /hd)	(ft ² /hd)	(m ² /hd)
Does	12 -18	1.1 - 1.7	25 - 40	2.3 - 3.7	16	1.5
Bucks	30-40	2.8 - 3.7	100	9.3	-	-
Young Kids > 30kg	8 - 10	0.7 - 0.9	20 - 30	1.9 - 2.9	10	0.9
Weaned Kids < 30 kg (66 lbs)	3 - 5.5	0.3 - 0.5	-	-	-	-

Source: Ensminger & Parker, Sheep & Goat Science, 5th Edition 1986 pg 304
Morhand-Fehr, in Goat Production, 1981, pg 271

Table 2: Feeder and Waterer Space Allowances

Class of Animal	Feeder Space				Waterer Space		
	Limit Fed		Self Fed		Bowl or Nipple (hd/bowl or nipple)	Tank	
	(in/hd)	(cm/hd)	in/hd)	(cm/hd)		(hd/ft)	(hd/m)
Does	16 - 20	41 - 50	4 - 6	10 - 15	40 - 50	15 - 20	49 - 66
Bucks	12	30	6	15	10	2	7
Young Kids > 30kg	9 - 12	23 - 30	4	10	50 - 75	25 - 40	82 - 131
Weaned Kids < 30 kg (66 lbs)	-	-	1 - 2	3 - 5	-	-	-

Source: Ensminger & Parker, Sheep & Goat Science, 5th Edition 1986 pg 304
Morhand-Fehr, in Goat Production, 1981, pg 271
- cells marked with a (-) no specific information available
- limit fed is also often referred to as Hand Fed

Information on recommendations for space requirements is very scarce. Most sources that do list recommendations **lack references or scientific backing** as to how the figures were arrived at. If we compare goats to sheep (at similar weights) we see the following important differences:

- weight range of mature female goats is 40 - 90 kgs;
- weight range of mature female sheep is 60 - 110 kgs;
- sheep take up (require) more space than goats because of fleece growth (except for Angoras);
- lactating dairy goats need less space (because nursing kids are not left with them) than lactating meat goats.

We need to be cautious recommending space allowances that have no scientific backing. In general, too little space may jeopardize the health and well being of the animals. Whereas too much space may make the buildings and equipment more expensive than is necessary.

- This is an area where further research is urgently needed, considering the rapid growth in the various sectors in the goat industry.

Section 2 ◇ Water, Feed and Feeders

Goats require adequate supplies of good quality water. This is especially important for lactating goats, which should have an uninterrupted supply of clean fresh water. Non-lactating goats on maintenance diets must have clean fresh water available on a daily basis, ensuring that all animals have the opportunity to drink as much as they want. Available snow and high-moisture feeds do not reduce the need for a good water source.

2.1 Watering Devices

2.1.1 Watering devices should be constructed and located so that they are readily accessible by goats and protected from fouling and to minimize freezing.

2.1.2 Water troughs, bowls, and nipples should be kept thoroughly clean and working properly.

2.1.3 Where electric watering or de-icing devices are used, adequate grounding of all metal pens and pipes to control trace voltages must be done. All electric watering and de-icing equipment shall be manufactured and installed in compliance with the Canadian Electrical Code (CSA – C.22.1) and associated directives. Provincial and municipal codes may also apply.

2.1.4 Watering devices should be designed and installed to avoid the likelihood of young kids drowning.

2.2 Feed

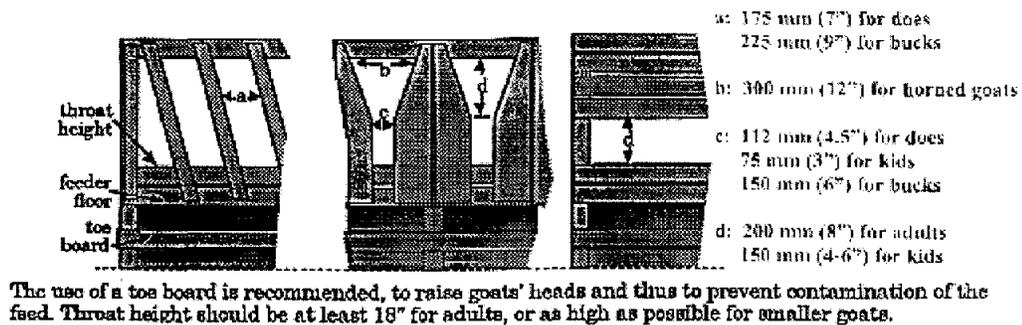
Whether the herd is grazing or browsing, semi-confined or totally confined, goat attendants must ensure that a balanced diet is provided. Producers must be familiar with the basic nutritional requirements of their goats. The requirements for goats are outlined in the National Research Council's *Nutrient Requirements of Goats*. Information is available through provincial agricultural ministries and through feed manufacturers.

- 2.2.1 Diets should be formulated based on forage analysis with consideration to environmental conditions, production requirements of the goats, age, size, body condition, intake levels, stage of lactation and reproductive status of the animals.
- 2.2.2 All dietary changes must be made gradually to avoid nutrient-related health problems.
- 2.2.3 All components of the ration should be free of spoilage or contaminants detrimental to the animal. Advice from a qualified ruminant livestock nutritionist should be sought when unusual feedstuffs are being considered as part of the ration. Due to goats' very selective feeding behaviour, regular monitoring of the feedbunk is important, to determine and correct the degree of feed sorting.
- 2.2.4 All feed and water additives/medications must be approved by the appropriate government agencies and/or a licensed veterinarian, and be administered accordingly.
- 2.2.5 Salt and minerals formulated specifically for the type of goats being kept, should be available at all times, or fed as recommended by a nutritionist or veterinarian. Special attention should be paid to regional variations in content in feeds.
- 2.2.6 The technique of Body Condition Scoring should be learned and used by goat attendants, to assess whether or not the diet of the herd is maintaining the animals in good body condition, appropriate to their stage of production. (See Appendix A).

2.3 Feeders

2.3.1 Feeder design requirements vary according to goat size and behaviour, the presence or absence of horns, type of production and type of feed. The feed should be protected from fecal and urine contamination or moisture, which could result in spoilage. Goats must be able to eat in comfort without danger of injury or entrapment. Feeders should be kept clean.

Figure 1. Examples of Typical Goat Feeders



Adapted from: *Meat Goats*, by Sara Emond, Alberta Agriculture, Food and Rural Development, Nov. 1994

2.3.2 When controlled feeding is practiced, feeder length should allow all of the goats in a group to feed at one time. Control fed goats need more feeder space than goats fed free choice. When free choice (self) feeding occurs, all of the goats should have as much access to feed as they want. Special attention should be paid to smaller and more timid animals to ensure their needs are met. Guidelines are given in Table 2.

2.3.3 Where large bales of hay are fed to goats, care should be taken to ensure that the bales do not fall over onto the goats as they eat. Feeders designed to prevent this are commercially available. Extra care should be taken to ensure that all bale string, twine, mesh or wrap is completely removed from the hay before it is fed to the goats. Such material may cause entrapment, intestinal blockage or injury, any of which could lead to death.

2.4 Pastures / Browsing Areas

- 2.4.1 Application of fertilizers, pesticides, herbicides or any top dressings on pastures or any area accessible to goats must be timed to prevent any risk to the animals or the meat or milk. Before and regularly during the grazing/browsing season, the area should be checked for poisonous plants. Poisonous Weed Website: <http://res.agr.ca/brd/poisonpl/poisworld.htm>
- 2.4.2 Goats must not have access to potentially toxic materials, such as lead batteries, petroleum products, some paints and anti-freeze.
- 2.4.3 Pastures and yards should be kept free of materials such as pieces of wire, scrap lumber, nails, or anything else with sharp edges or any characteristic which could cause injury to the animals.
- 2.4.4 Goats on pasture must have access to a well-drained resting area and to shelter from adverse weather conditions.

Section 3 ◇ Reproduction

3.1 Bucks

- 3.1.1 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 (see Appendix A). Some bucks will lose condition during breeding season whether they are used or not. They should be fed a balanced diet to maintain adequate condition throughout the breeding season and following that period.
- 3.1.2 Bucks should be removed from the doe herd except during breeding periods. (Bucks are capable of breeding as early as 12 weeks). Solitary isolation is not recommended for goats. Whenever possible, bucks should be kept in the company of suitable animals. Rams (sheep) should be kept away from breeding does (goats).
- 3.1.3 When teaser bucks are used to improve breeding management, a vasectomy or epididectomy should be performed by a licensed veterinarian and followed up by a semen evaluation.

- 3.1.4 Where breeding bucks are fitted with a marking harness to confirm breeding dates, the harness should be checked regularly to ensure that it is adjusted properly to avoid injury or discomfort. It should not be left on for longer than is necessary.
- 3.1.5 Due to the natural behaviour of establishing dominance placing more than one buck at a time with does can result in serious injury caused by fighting. When more than one buck is used to breed a group of does, their behaviour needs to be closely monitored to avoid the possibility of injury.

3.2 Breeding

- 3.2.1 To prevent health and management problems, the timing of first breeding should take into account the overall physical development of the doeling. Young goats that are bred at less than 65% of their mature body weight can experience increased birthing difficulties, reduced milk production and reduced growth. C. GALL. GOAT PRODUCTION 1981 pg. 144-146.
- 3.2.2 Does and doe kids should be managed so that they have suitable body condition scores at the times of breeding and kidding (see Appendix A).
- 3.2.3 Where natural mating is conducted, proper attention must be given to the previous and current health status of the male and female to prevent the transmission of infectious diseases.
- 3.2.4 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.
- 3.2.5 Only a trained technician using proper techniques and equipment may collect semen from goats and artificially inseminate them by means other than laparoscopy. Insemination by laparoscopy must be done by a veterinarian.
- 3.2.6 Collection of embryos from goats is a surgical procedure and should be done by a veterinarian. Collection of embryos for export is to be done by a veterinarian approved by the Canadian Food Inspection Agency (CFIA). Surgical implantation of an embryo should be done by a veterinarian.

3.3 Kidding and Kidding Facilities

- 3.3.1 Newborn kid survival is highly dependent on adequate nutrition throughout gestation to assure proper placental and fetal growth. Multiple fetuses are very common in most breeds, and does should be fed accordingly. Particular attention should also be paid to the nutritional needs of lactating does. To determine specific needs, consult appropriate references on nutrient requirements of goats, a qualified ruminant nutritionist or your veterinarian.
- 3.3.2 Does kidding under grazing conditions should be disturbed as little as possible. They should, however, be observed frequently enough to ensure that any problems are given prompt attention, and to prevent predation. A clean, dry shelter should be available for kidding does.
- 3.3.3 Does in confinement require a clean and dry area in which to give birth. A clean and dry claiming area is recommended as well. (Guidelines are given in Table 3).
- 3.3.4 Where kidding and claiming pens are used, every effort should be made to prevent build up and spread of infection by providing clean, dry bedding, which is regularly replaced. Dead kids and afterbirths should be removed and disposed of in such a way that other goats, dogs, predators and other animals will not have access to them and must comply with the appropriate regulations.
- 3.3.5 Does should be allowed to kid without intervention if possible. Attendants should become familiar with normal kidding behaviour in order that problems can be recognized early. When assistance is provided at kidding, it must be by a competent attendant using good standards of hygiene and accepted veterinary techniques. Inexperienced attendants should seek guidance before the start of kidding and, in the event of a problem, should immediately seek experienced help.
- 3.3.6 Aborting does, does at risk of aborting, and kidding does may be infected with diseases potentially hazardous to people, in particular pregnant women or people who are immuno-compromised or have heart problems. It is recommended that people at risk should, in consultation with their veterinarian and physician, inform themselves of those risks. (Refer to Appendix E).

3.4 Neonatal Care

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

3.4.1 Kids should be treated with a suitable navel disinfectant at birth.

3.4.2 The first four days after birth are critical to the kid. The kid goes from an almost sterile womb to an environment full of beneficial and harmful micro-organisms. Colostrum is the kid's first line of defence since it contains antibodies to all of the harmful micro-organisms that the mother was exposed to during her lifetime. Colostrum contains Vitamin A, D, E and K, copper, zinc and selenium that are all important to the kid during this adjustment period. The colostrum also contains immune cells from the mother which help stimulate the kid's own immune system. There are other factors present to help the newborn kid to quickly adapt to its environment. Adequate colostrum is essential and should be fed immediately after birth. Kids should be encouraged to nurse from their mothers.

3.4.3 In herds where diseases such as Caprine Arthritis Encephalitis (CAE) and Johnes are a problem then kids should be removed from the mother immediately after birth and not be allowed to nurse. The kids can be raised artificially on several recommended programs. This could be on heat-treated colostrum, cow colostrum or commercial colostrum replacer. The producer must ensure that the kid receives adequate quantities of the colostrum or colostrum replacer.

3.5 Fostering

When necessary, kids may be fostered on another doe with a good milk supply. Attendants should ensure that kids receive enough milk to maintain health and growth. A fostering stanchion may be used to ensure the safety of a kid being fostered on another doe or to protect weak or rejected kids from their own dam. When used, a fostering stanchion must be designed so that the doe can easily stand up and lie down, as well as reach her food and water. Fostering stanchions should be used until the kid's safety is assured.

3.6 Artificial Rearing of Kids

When hand feeding colostrum, kids should receive 150ml/kg of body weight over the first 24 hours.

- 3.6.1 Kids being artificially reared should have adequate quantities of good quality colostrum or a colostrum substitute and goat milk substitute (milk replacer or cow milk) available until they are able to consume sufficient solid feed for their needs. Kids weaned at 30 days of age, and weighing 13.5kg (30 pounds), need specialized care by a person aware of their extra needs.
- 3.6.2 Utensils for feeding liquids should be thoroughly cleaned and sanitized immediately after each use. Troughs and buckets should be clean and any stale feed removed. Automatic feeding equipment should be cleaned at regular and frequent intervals. It is critical that breeders follow manufacturers' instructions for mixing and feeding milk replacer. Producers should ensure milk replacer is not past the expiry date. Special attention must be given to good water quality.

3.7 Identification

Kids should be identified as soon as possible after birth to aid in effective management of the herd.

- 3.7.1 Ear tags are a convenient and acceptable means of identification. The tags are of a size suitable for goats and sheep, and applied by a competent operator using properly maintained instruments and good hygienic practice. More than two tags per ear are considered excessive. When re-applying tags, the operator should use the pre-existing hole in the ear if possible.
- 3.7.2 Permanent identification may be accomplished by means of legible tattoos in one or both ears or on the underside of the tail, or by the insertion of an electronic implant. Such procedures should be carried out by a competent operator, using properly maintained instruments and good hygienic practice.
- 3.7.3 Where paint or other materials are used for temporary identification, a scourable and non-toxic product should be used. This is particularly important for fibre goats.
- 3.7.4 Claiming pen: A small pen-like enclosure into which a doe and her newborns are placed before or immediately after birth. This allows bonding to occur between doe and kids without disruption and

interference from other herd-mates.

Section 4 ◇ Herd Management

4.1 Supervision and Handling

- 4.1.1 All personnel working with goats should understand and accept their responsibility to prevent avoidable suffering of animals. Owners should ensure that attendants responsible for the animals' care have the skills necessary to respond to the needs of all goats entrusted to them.
- 4.1.2 Working routines of attendants should be consistent and should be performed on a regular schedule. People should move about in a way that minimizes disturbances.
- 4.1.3 Properly designed and maintained handling equipment will minimize injury and distress. Runways and pens should have walls or barriers high enough to discourage jumping. Treatment areas should be designed to allow convenient and safe handling of the animals while restraining them firmly. All restraint and handling facilities must be free of sharp edges, projections, or other features likely to cause injury to the goats.
- 4.1.4 Goats should be handled in a calm manner at all times, with care to avoid injury, pain, and distress.
- 4.1.5 People attending goats should know how to catch and restrain them properly. The proper use of a crook, by a competent operator, is acceptable. Goats should not be caught or moved by grabbing their fleece or hair. Catching them by the horns should be done with caution to avoid breaking the horns or damaging the skull.
- 4.1.6 There are several of acceptable techniques and types of equipment for restraining goats. Restraining techniques include, but are not limited to: hand restraint under the jaw and over the head, hand restraint under the jaw only, sitting the goat down between the operator's legs (as for shearing Angoras). Suggested equipment for restraining could be a halter, a stanchion, a shearing headstall and/or a goat handling chute. In all cases the objective is to choose the appropriate technique for restraint of the animal, with a minimum of stress or discomfort, while carrying out the procedure. The goat should be released from restraint as soon as possible.

4.1.7 Goats must be treated with patience. An understanding of the herd instinct may help. A goat that breaks away will continue to run away as long as it is chased. It is likely to return to the herd if it is allowed to do so.

4.1.8 Goats should be lifted with proper support for the chest and abdomen. They must not be lifted by the ears, horns, tail, hair or legs.

4.1.9 Electric prods are not an effective or efficient means of directing goats and must never be used.

4.2 Cruelty and Neglect

4.2.1 It is unacceptable for any person to:

- mistreat animals under his/her care and attention
- neglect animals so that they experience avoidable pain, suffering or distress
- fail to provide a diet to maintain animals in full health and vigour
- slaughter, confine, handle or transport animals in a manner causing avoidable pain, suffering or distress
- keep alive animals that are in pronounced physical or psychological discomfort unless they are under the direct care of a licensed veterinarian.

4.2.2 Financial cost must not be considered a reason for neglecting a goat obviously in distress or for failing to secure prompt and appropriate medical treatment when necessary.

4.2.3 Any person, particularly in the goat industry, who observes goats that are neglected, deprived of the basic necessities or subjected to cruelty or abuse should report such situations to the proper authorities.

4.2.4 Ignorance is no excuse for inflicting hardship or abuse on animals. Charges of animal abuse can be laid under the Criminal Code of Canada or provincial statutes.

4.3 Raising Kids

4.3.1 Kids raised with their dams should be checked daily. Any problems observed such as lethargy, lameness, diseases or signs of parasitism should be dealt with in the appropriate manner. In many

cases this will also require examination of the dam, paying particular attention to the udder and milk supply.

- 4.3.2 When kids are separated from their dams they should be moved to clean, sanitized housing. All surfaces, to which kids are exposed, such as pen walls and feeders, should be kept clean and free of excrement. Bedding should be kept very clean and dry. Housing should be safe, free from protrusions or openings that can cause injury or discomfort.
- 4.3.3 It is recommended that kids be kept in groups small enough to ensure accurate observation by the attendant(s). Kids housed in the same pen should be of similar age and size. Pens must be large enough to allow all kids to rest comfortably and feed at the same time. Adequate space for exercise is recommended. Buck and doe kids are capable of breeding and conceiving as early as 12 weeks. If buck kids are left intact, separation of kids by sex, should occur prior to three (3) months of age to prevent unplanned pregnancies. R. BATTAGLIA, HANDBOOK OF LIVESTOCK MANAGEMENT, 1988.
- 4.3.4 During the milk-feeding period, kids should be fed at frequent intervals but not less than twice per day. Milk or milk replacer fed in a self-feeder should be replaced as required, before it spoils. Before their milk supply is removed, kids to be weaned should:
- weigh at least 2.5 times their birth-weight
 - be readily drinking water
 - be consuming daily a minimum of 160 to 225 grams (0.35 to 0.5 pounds) of solid feed
- P. MORAND-FEHR, PROCEEDINGS OF 3RD INTERNATIONAL CONFERENCE ON GOAT PRODUCTION AND DISEASE 1982, PAGE 100.
- 4.3.5 The feeding program for kids should provide all dietary components necessary for normal growth and health according to physiological requirements and age. Clean, fresh water, a grain-based creep ration, and high quality roughage should be introduced on a free choice basis by 1 week of age to promote rumen development.
- 4.3.6 Environmental factors known to contribute to illness, discomfort and abnormal behaviour in kids are fluctuating temperatures in the pen, excessive moisture in bedding or yards, ineffective ventilation, and nutritionally unbalanced diets. Whenever these factors are observed, appropriate steps should be taken.

4.4 Disbudding and Castration

Only a competent person using proper equipment and technique must conduct these procedures. The term competent person refers to an individual who has acquired and demonstrated suitable skills, experience and proficiency to perform, or assist in performing, specifically identified activities or procedures. Persons conducting these procedures must take all precautions to avoid unnecessary pain or distress to the animal during the procedure and recovery period. Training assistance is available through local and provincial goat organizations and licensed veterinarians.

4.4.1 *Disbudding*

Horned goats can cause serious injuries to herdsmates and handlers; the prevention of horn growth is an advisable option with the exception of certain breeds. Disbudding occurring after the colostrum period (3 days of age) and before 10 days of age has been observed to cause the least possible distress to the animal. Where the presence of horn buds is determined, a heated iron or electronic device is applied to each horn bud just long enough to deaden the horn-growing tissues of the area. Care must be taken not to overheat the kid's head. Kids should be returned to their normal surroundings as soon as possible after the procedure. (See Appendix B).

4.4.2 *Castration*

Castration is often performed to prevent unwanted breeding activity and aggressive behaviour by male goats. When castration is performed, it should be done as early as management procedures will allow. Castrate as soon after birth as you can grasp both testes in the scrotum. This should be after the kid has received colostrum and before seven days of age. A variety of instruments and techniques can be used (R.A. BATTAGLIA, HANDBOOK OF LIVESTOCK MANAGEMENT TECHNIQUES, 2ND EDITION, PRENTICE HALL, INC.). Adequate animal restraint and cleanliness of instruments and operator's hands are important for all castration techniques. Any abnormal behaviour can be an early indication of infection. If evidence of infection is present, administer antibiotics as recommended by a licensed veterinarian. If flies are present, spray the wound with a wound safe repellent daily. There are three common types of castration techniques:

- Elastrator
- Emasculator
- Surgical removal of testes

4.5 Health Management

- 4.5.1 To avoid many diseases, plan ahead. You should attend a kidding or lambing workshop to learn valuable techniques such as intravenous and intra peritoneal injections and passing a stomach tube. If no workshops are available have your veterinarian help you. Have feed analysis done and work with a nutritionist who is familiar with the feed related problems in your area. For example, it is better to know that your does need loose cobalt iodized salt during pregnancy than to discover it after half your kids are born weak or still born with goiter. Problems often create new problems if left neglected.
- 4.5.2 Goat attendants need to be able to evaluate the condition of their herd and detect signs of illness. They should be able to identify a distressed or ill goat and determine when professional help is required. Goat owners must ensure that attendants have this knowledge.
- 4.5.3 All goats kept in confinement should be inspected at least once a day. During late gestation and early lactation more frequent inspection is required. The arrangement of pens and yards should enable easy visual inspection of all areas used by the goats.
- 4.5.4 In extensive grazing/browsing situations, the attendant should maintain adequate surveillance of the goats.
- 4.5.5 It is strongly recommended that disbudding be done at an early age as stated in section 4.4.1. Producers must be aware of pain management. In some cases, the removal of the sharp tips of the horns may be an adequate solution. The use of rubber rings or cattle gouges on the horns of mature animals is not recommended because of the long-term stress on the animals. Due to the stress associated with transportation, it is recommended that this procedure be done on farm.
- 4.5.6 Animals with horns and aggressive goats should not be mixed with dehorned or polled goats, particularly in confinement situations.
- 4.5.7 Distressed goats should be dealt with humanely and promptly to prevent avoidable suffering. Sick or injured goats must be attended to immediately and a decision regarding treatment, humane euthanasia (see Appendix D) or emergency slaughter must be made in an appropriate manner. These

decisions should be made in the context of the attendant's knowledge of goat diseases, and with the guidance of their herd veterinarian.

- 4.5.8 Sick, injured or disabled goats should be evaluated and stabilized before being subjected to the rigors of loading and transportation. Slaughter at a nearby local abattoir is an alternative if the animal is free of residues, can be transported humanely and can be isolated from interference from other animals. Goats considered to be in severe distress should be euthanized or slaughtered on site and under no circumstances should they be transported to livestock auction markets or over long distances to meat packers.
- 4.5.9 Dead goats, placentae and aborted fetuses, as well as offal and pelts from farm-slaughtered animals must be removed immediately and disposed of according to appropriate regulations.
- 4.5.10 It is mandatory for some diseases to be reported under federal and provincial legislation. If an animal is suspected of having such a disease, a veterinarian must be advised immediately. When a reportable disease has been confirmed, the producer must immediately introduce the appropriate measures required under the provisions of the applicable legislation. (See Appendix E).
- 4.5.11 In addition to reportable diseases, there are other diseases, which carry human health risk. (See Appendix E).
- 4.5.12 Hoof care should be conducted as required and at regular intervals by a competent person using proper equipment. Hoof infection or leg abrasions should be treated without delay.
- 4.5.13 A herd health program should be designed and implemented in partnership with the veterinarian. Its purpose is to optimize herd productivity through the prevention and control of diseases and through the integrated management of nutrition, reproduction and kid rearing. Programs should be designed with consideration to climate, management system, marketing demands and to the etiology of specific diseases.
- 4.5.14 Some predation preventive methods currently employed in Canada include electric fencing, area lighting, night housing, noise devices, taste-aversion chemicals and livestock guarding animals. Since none of these methods are totally effective, producers are encouraged to support research and

development of better means of predator protection for goats. Combinations of preventive methods are more effective than solo.

4.5.15 A limited number of drugs and vaccines are approved for goats. Pharmaceuticals that have on the label or in the instructions “for goats” or “for use in livestock” can be used for goats. The following definitions outline the responsibilities the veterinarian and the producer have in the appropriate use of medications:

- Prescription Drugs “Schedule F Drugs”: To use these drugs the producer must be a client of the veterinarian and the veterinarian must have examined the goat(s) prior to prescribing the drug. The veterinarian should only dispense enough medication to treat that goat or group of goats. It is the veterinarian’s responsibility to provide a written description on how to administer the drug and the appropriate withdrawal period for meat and milk.
- Over the Counter Drugs: The producer can purchase these from any store that specializes in livestock supplies or from a veterinarian. The producer is responsible for following the label recommendations for dosage, route of administration and the withdrawal period. It is recommended that the producer consult with a veterinarian about the drug prior to use.
- “Off Label” or “Extra Label”: These terms apply to both prescription and over the counter drugs and involves a notation of the label information regarding the appropriate use and dosage of the drug. If the drug in question is a prescription then the veterinarian is responsible for explaining how any deviation from the label recommendations should be handled. This is particularly important in establishing withdrawal periods for milk and slaughter. “Off label” use of over the counter drugs should only be done on the advice of a veterinarian.

4.5.16 When any drug is administered, the bottom line is to protect the well being of the animal, the environment and the food supply from drug residue in order to minimize the build up of drug resistance in organisms that cause disease. A producer must also:

- Check drugs on a regular basis and discard any that have expired or accidentally frozen, been exposed to extreme heat or have tops that have been ruined by repeated use.

- Follow the label directions concerning the dosage, route of administration and withdrawal periods.
- Avoid intermuscular injections into the prime cuts of meat.
- Seek veterinarian advise if unsure, and identify the goats that are being treated and keep records of the medications, dosage, dates treated and withdrawal times. Any adverse reactions should also be recorded.

Section 5 ♦ Chevon, Dairy and Fibre Goat Management

5.1 General

- 5.1.1 The manager of an operation should develop, in consultation with a veterinarian, an appropriate herd-health program and management system. Medication should not be used to replace good husbandry practices.
- 5.1.2 The manager of a goat facility must maintain a health record, including treatment and medication used, for every animal. Competent personnel must administer medication and withdrawal periods must be observed.
- 5.1.3 Yards for goats must be well drained and protected from wind. Lactating goats should not be exposed to extremes of weather or conditions, which can lead to health problems especially mastitis. Goats must have access to dry well-bedded shelter (refer to Shelter Area, Section 1).
- 5.1.4 All goats should receive a daily ration that meets all nutritional requirements. The composition of the ration should be balanced to meet the requirements for production, reproduction, body size and condition score, and environmental conditions.
- 5.1.5 Feed interruptions and sudden changes in rations should be avoided.

- 5.1.6 When horned goats are present, feeders and fences must be designed to prevent animals being caught by the head and trapped or strangled.
- 5.1.7 Very aggressive or timid animals should be separated from the rest of the herd or culled.
- 5.1.8 Bucks should be examined frequently for infection of or around the opening of the penile sheath. With Angora bucks, it is recommended that the belly be shorn to prevent such infections from developing because of the density and length of the coat in this area.
- 5.1.9 New arrivals should be quarantined for a minimum of 30 days from the other goats. The area should be kept clean and dry and include shelter from adverse weather.
- 5.1.10 New arrivals must have access to an adequate supply of good quality water and feed. They should be introduced gradually to the ration used.
- 5.1.11 The bedded areas should be prepared before the animals enter quarantine. Pens must be dry and well bedded.
- 5.1.12 New arrivals must be closely monitored for health and for feed and water intake.
- 5.1.13 Isolation pens should be available to accommodate sick animals.
- 5.1.14 Any animal requiring medical treatment must be identified, treated and a record of treatment kept.
- 5.1.15 The space allowance for goats housed in groups should be calculated in relation to the whole environment, to the size of the group and the age, sex, weight and behaviour of the stock. Table 1, Section 1 lists the minimum space per animal that should be available in close confinement housing.

5.2 Chevon Management

- 5.2.1 Market goats are goats kept primarily for use as chevon (goat meat). Since ancient times, goats have been domesticated and in many parts of the world chevon is the first choice for meat protein. A market goat does not have to be a particular breed, but a type of goat chosen for its increased

muscling and high meat-to-bone ratio. A market goat could be any breed, but fast weight gain and increased muscling is the determining factor of superior chevon stock.

- 5.2.2 Facilities should be properly drained with particular attention to feeding and watering areas. Excessive buildup of manure should be avoided in keeping with good animal husbandry practices.
- 5.2.3 Facilities should have properly designed and maintained handling, sorting and loading equipment.
- 5.2.4 Goats which are being raised for meat, are entitled to the same specifications for shelter, feed and care as any other goats.
- 5.2.5 Producers must follow the regulations for the slaughter of goats that are applicable to their province.
- 5.2.6 Producers shall ensure that anyone who purchases goats from them transports the goats in a humane manner.
- 5.2.7 Any injections given to a goat for the meat market should be given in the neck area. This will avoid damage to the choice cuts of meat.
- 5.2.8 Any producer who sells goats for meat must ensure that they are completely free of all drug residues and that they adhere to the withdrawal times specified by the manufacturer or veterinarian.
- 5.2.9 Goats which are sold for meat must be slaughtered in a government inspected facility. No producer should knowingly sell a goat for meat if they suspect that the purchaser plans to slaughter the animal privately.

5.3 Dairy Management

5.3.1 Dairy goats, whether kept for a family milk supply or in a large commercial herd, require special consideration because of the high nutritional demands of lactation and the vulnerability of the lactating udder to injury and/or exposure, which can lead to disease.

5.3.2 Milking Parlour and Milking

- Access routes to the milking parlour should be safe and properly illuminated. The floor should have good traction and should be kept clean.
- The interior of the milking parlour should provide the does with comfort. Gates and restraining devices of individual holding units must operate safely. The holding unit itself must be free of protrusions that might cause injury or distress.
- Proper ventilation eliminates condensation in milking parlours and service areas. An adequate controlled ventilation system of fans and air inlets should be installed. Improved levels of insulation and vapour barriers are of value and supplemental heating may be required for colder weather periods.
- Adequate lighting for the task should be provided. Milking parlour lighting at udder level must be adequate to assure cleanliness and operator comfort.
- Does should not be made to wait in the holding area for extended periods before entering the milking parlour. The waiting time should be consistently maintained for each milking.
- Pen and parlour gates must operate freely and with a minimum of noise. Hinges should be lubricated and latches padded to reduce noise. Latch protrusions should be reduced to maintain the safety of the goats and operators.
- When cleaning and preparing the udder for milking, dairy workers should maintain high standards of hygiene. It is important that teats and surrounding parts of the udder be adequately cleaned and dried before milking.
- Only milking equipment with an appropriate vacuum level, pulsation rate, and pulsation ratio should be used. Attention must be given to maintaining such equipment in good working condition.
- To maintain udder health, over milking should be avoided.
- To reduce infection of the mammary gland, the teats of does should have a suitable teat dip solution applied as soon as milking is finished.

- Milking parlours should only be used for milking. Negative experiences contribute to stress on the milking does and hinder the milk release.
- Milking routines should be consistent, normally occurring twice a day.
- The parlour should be cleaned thoroughly immediately after milking, and the equipment must be properly sanitized.

5.4 Fibre Management

5.4.1 Fibre goats are primarily raised for mohair or cashmere; mohair is the product of the angora goat. A type of goat, with a long and extremely fine secondary hair coat produces cashmere. Fibre diameter is the single most important economic consideration for mohair and cashmere producers. Although fibre can be decreased by limiting the level of energy and protein in the diet, total fleece yield is more negatively affected. Fine fibre should not be produced at the expense of the health of the animal. Underfeeding decreases reproductive and production performance and increases the animals' susceptibility to disease.

5.4.2 Shearing

The working area for shearing should be well lit and ventilated, adequate in size, and clean to ensure the well-being of the goats and the safety and comfort of the shearer.

- If pre-kidding shearing is not practiced, crutching is recommended for does with long fleece in order to improve the level of sanitation and to facilitate early suckling (see Appendix C).
- When shearing goats, consideration should be given to the time of year, the climatic conditions, and the available shelter. The nutritional requirements of goats increases in cold weather.
- A competent shearer must shear goats in order to keep the time the goat is restrained to a minimum. Being restrained for a long period of time is more stressful to the goat than the actual shearing.
- Minor cuts and scrapes will not have detrimental effects on the goats; however, steps should be taken to minimize this. Shearers should be reminded that goat's skin tends to be looser and softer than that of a sheep and extra care needs to be taken. Special "goat" combs must be used that have teeth closer together and tips tapered back to be safer for goats.
- Goat attendants and shearers should be aware of the danger of spreading certain diseases, such as Caseous Lymphadenitis, through the use of contaminated shearing equipment. Shearing

equipment should be treated with a suitable disinfectant between herds, and between infected or suspect animals within a herd.

- Infected or suspect animals should be sheared last.
- Animals to be sheared should be sheared from youngest to oldest

Section 6 ◊ Transportation

6.1 Definitions

Animal at Risk An animal with reduced capacity to withstand the stress of transportation due to injury, fatigue, infirmity, poor health, distress, very young or old age, impending birth, or any other cause. Some animals at risk are unfit to be transported. Others can be transported providing special precautions are taken.

Container A box or crate that is constructed for the shipment of livestock and that can be moved independently from one mode of transportation to another.

Loading Density The unit of space required per animal or animal's weight per unit of space on a vehicle.

Non-Ambulatory Animal

An animal that is unable to stand without assistance, or that is unable to move without being carried. Non-ambulatory animals are also called "downers".

Segregate To keep animals apart, therefore avoiding physical or visual contact and interaction with each other.

Unfit Animal An animal that is sick, injured, disabled or fatigued and that cannot be moved without causing additional suffering and must not be transported.

Vehicle Any means of conveyance used for the transportation of goats, including trucks, tractor-trailers, railway cars, ferries, ships and aircraft.

6.2 Responsibilities

- 6.2.1 Persons handling or transporting goats should be properly instructed and knowledgeable about goat behaviour and welfare, and must comply with regulations of the *Health of Animals Act* and applicable provincial regulations. (Appendix G & H).
- 6.2.2 Employers are responsible for ensuring that personnel directly involved with the transport of goats are adequately trained and knowledgeable of their care and handling.
- 6.2.3 Drivers are responsible for the care and welfare of the goats during the entire stage of transport that they undertake.
- 6.2.4 Shippers are responsible for using only transporters who are knowledgeable in the care and transporting of goats, and that animals tendered for transport are fit to undergo transportation.
- 6.2.5 Everyone who is directly or indirectly involved in the transportation of goats must comply with the federal *Health of Animals Regulations*, Part XII which is briefly summarized in Appendix G and is accessible on the Internet at <http://laws.justice.gc.ca/en/H-3.3/C.R.C.-c.296/132005.html> and applicable provincial regulations concerning the humane transportation of animals.
- 6.2.6 Recommendations for the shipment of goats by air are available in the *Live Animals Regulations* of the International Air Transport Association (IATA). Copies can be obtained from: Publications Assistant, IATA 800 Place Victoria, P.O. Box 113, Montreal, Quebec, H4Z 1M1.

6.3 Vehicles

- 6.3.1 Vehicles used to transport goats should be in excellent condition and must be in full compliance with provincial highway traffic legislation. Prior to loading a vehicle, an interior inspection should be performed and bedding added or other corrective measures taken to assure safe transportation.
- 6.3.2 Vehicles used to transport goats must have sides that are secure, strong and high enough to prevent goats from jumping from, falling off or being pushed from the vehicle. To prevent injury, vehicle design and construction must prevent protrusion of any part of an animal from the vehicle or entrapment.

- 6.3.3 Vehicles must have doors which close firmly and securely, with a livestock-proof locking system. Doors and internal gates should be sufficiently wide to permit goats to pass through readily, without bruising or other injuries.
- 6.3.4 Vehicles should have smooth fittings and must be free of protruding bolt heads and any sharp protrusions.
- 6.3.5 Vehicles floors must provide secure footing for the animals.
- 6.3.6 Goats should only be loaded into vehicles which are clean and disinfected, to control the spread of disease.
- 6.3.7 Goats have a low tolerance for moisture. Straw, wood shavings and peat moss are recommended as bedding materials that also absorb urine, keeping the goats clean and dry. Any materials that are used should be free from substances known to be irritating or harmful to goats or to contaminate meat or milk. Under adverse weather conditions, goats need protection from exposure to moisture, such as the use of a cap or tarpaulin to cover the vehicle box.
- 6.3.8 Vehicles must be constructed to provide goats with adequate ventilation at all times, while avoiding drafts. In response to temperature changes during a trip ventilation should be adjustable from the outside of the vehicle. Care must be taken to prevent entry of exhaust from the vehicle into the area containing the goats.

6.4 Containers

- 6.4.1 Containers should be suitably designed, constructed and labelled with full details including species, and should have clear instructions for feeding and management. Unless livestock can be seen from the outside of the container, each container must have a sign or symbol to indicate that it contains live animals and to show its upright position.
- 6.4.2 Internal container temperature and air quality may not be adequate even when conditions outside the container are ideal. Suitable air exchange must be provided. Temperature and ventilation inside the containers should be monitored throughout the trip.

6.4.3 Containers that hold goats should be kept in a level position during all stages of transport. They should always be moved smoothly.

6.4.4 Containers must be secured to vehicles to prevent movement during transit.

6.5 Loading and Unloading

6.5.1 Goats must not be loaded or unloaded in such a manner as to cause injury or avoidable suffering. It is acceptable to load goats by grasping them around the body and placing them in the transport vehicle, provided that it is done with care and the goats are not handled in a rough manner. (See Supervising and Handling - Section 4.1).

6.5.2 Abrupt movements, noises or flashes of light should be avoided, as they may frighten the animals.

6.5.3 Loading and unloading should be done using properly designed chutes and ramps plus holding and sorting pens. The footing should be secure. The sides should be high enough to prevent the goats from falling or jumping off and low enough to prevent escape from underneath or entrapment. Ramp slope should not exceed 35°.

6.5.4 No gap should exist between the ramp, its sides and the vehicle. The dock surface should be level with the vehicle floor. If the loading surface and the vehicle surface are not level, goats should not be required to negotiate a step in excess of 38 cm (15 inches).

6.5.5 Ramps must be free from projections and sharp edges.

6.5.6 Contrasting shadows and bright spots may intimidate goats and interfere with their orderly movement. Uniform lighting of the areas through which the animals are to be loaded, such as sorting pens, single-file chutes and loading ramps, may help to prevent balking and reversing of direction. During loading at night, lighting the interior of the vehicle encourages the goats to move forward. On bright sunny days, it may help to cover the outside part of the loading dock to darken it.

6.6 Segregation

6.6.1 Every effort should be made to eliminate unnecessary mixing of animals from different sources.

- 6.6.2 Under the federal *Health of Animals Regulations*, animals that are incompatible by nature, disposition, temperament, gender or due to substantially different weight or age must be segregated while on the same vehicle.
- 6.6.3 Bucks should be segregated from does. Groups of bucks, if mature, must be segregated from all other animals during transport.
- 6.6.4 As a general rule, horned goats should be segregated from hornless goats.
- 6.6.5 Goats of different health status should be segregated during transport.

6.7 **Space Allowances**

- 6.7.1 In order to prevent injury or suffering, goats must not be overcrowded in a vehicle or container. All goats should be able to lie down comfortably at the same time. Appendix H shows maximum loading densities for goats.
- 6.7.2 Every goat must be able to stand in a normal position without touching an overhead roof or deck.
- 6.7.3 In a large vehicle, goats should be partitioned into smaller areas to provide stability for the animals and the vehicle. Sub-pens should be no longer than 3.1 m (10 feet).

6.8 Care in Transit

- 6.8.1 Drivers should check each load immediately before departure to ensure that the goats have been properly loaded.
- 6.8.2 Drivers should check each load again early in the trip and adjustments made as appropriate. The driver should check for signs of general discomfort of the goats, such as overheating or chilling. If required, the distribution of the goats should be readjusted as soon as possible. Periodic checks should be made any time the load stops. On longer hauls, goats should be checked at least every 3 hours. (Table 4).
- 6.8.3 Drivers should start, drive and stop their vehicles as smoothly as possible. They should practice defensive driving by ensuring that adequate space is available should an emergency require an unexpected stop. They should negotiate turns in the smoothest possible manner. Sharp turns should be avoided.
- 6.8.4 Weather conditions should be monitored and ventilation adjusted.
- 6.8.5 Extra precautions should be taken to avoid stress or death caused by weather extremes, such as very hot and humid or very cold weather. On trips exceeding 12 hours, available proven technology such as temperature probes should be used to allow monitoring of the animal environment in trailers. In extremely or rapidly changing weather, animals should be inspected frequently.
- 6.8.6 During hot and humid weather:
- a) Adequate airflow must circulate throughout the vehicle or container to keep the goats comfortable.
 - b) Vehicles containing goats should not be parked in direct sunlight. When it is necessary to stop, the driver should take all necessary steps to ensure that the duration of the stop is minimized.
 - c) Loading density should be reduced.

- d) Goats should be handled with extra care because physical activity increases heat stress. Every animal should be treated with great patience and should be allowed to rest to avoid over-exertion.
- e) Transportation should be rescheduled if possible, such as during the cooler night time or early dawn.
- f) For trips exceeding 12 hours, the driver should keep the vehicle moving during the hottest period to circulate air through the vehicle, and provide any rest stop during the cool night time hours.

6.8.7 During cold weather:

- a) Goats must be protected from frostbite and loss of body heat during transport. Lactating does, young kids and recently shorn goats are particularly susceptible.
- b) Wind chill lowers the effective environmental temperature (Appendix I). Goats will pile up when exposed to direct wind, possibly leading to suffocation; openings should be covered to protect the goats from cold draughts. The load should be checked more frequently to ensure an adequate balance between protection from cold and provision of adequate ventilation.
- c) Extra measures should be taken to keep the goats dry and comfortable, for example by providing extra straw or other suitable bedding.
- d) Goats must be protected from direct contact with the vehicle's cold metal surfaces by lining the floor and sides with wood, straw or other suitable insulating material. Must ensure there is still adequate ventilation.

6.9 Feed, Water and Rest for Goats in Transit

- 6.9.1 Transporters should plan their long-distance trips considering first the route which minimizes transport time and stress to the animals, and second, the location of facilities at which goats may be adequately fed, watered, sheltered and cared for in a humane manner.

- 6.9.2 Goats destined for trips exceeding 24 hours must be fed and watered within 5 hours before departure. Particular attention should be paid to young goats, kids, and pregnant and lactating does. Nursing kids accompanying their dams should be allowed an opportunity to nurse undisturbed at suitable intervals.
- 6.9.3 More research is required to determine maximum acceptable travel times and desirable feed, water and rest intervals for goats. Under the federal *Health of Animals Regulations*, goats must not be confined in a transport vehicle for more than 48 hours without being offered adequate feed, water and rest. This time may be extended only if they will reach their final destination without having been confined in a vehicle for longer than 52 hours. The regulations require that the rest period be at least 5 hours in duration. However, it is recommended that feed, water and rest be provided at intervals not exceeding 24 hours, and that rest periods be at least 8 hours in duration.
- 6.9.4 Feed, water and rest should be provided more often for animals at risk, such as very young or old animals, and for animals that are transported under adverse weather conditions, such as travel through different climatic zones and weather extremes. Kids too young to be fed exclusively on hay and grain should be provided with suitable feed and water at least every 12 - 18 hours. Nursing kids accompanying their dams should be allowed an opportunity to nurse undisturbed at suitable intervals.
- 6.9.5 The *Health of Animals Regulations* also require that places where animals are unloaded for feed, water and rest as noted above maintain or have access to facilities at which the animals may be adequately fed, watered, rested, cared for and sheltered from inclement weather. Goats unloaded to be fed, watered and rested must be placed in a pen with ample, suitable ice-free water. The goats should be able to lie down comfortably at the same time.

6.10 Animals at Risk

An animal with reduced capacity to withstand the stress of transportation, due to injury, fatigue, infirmity, poor health, distress, very young or old age, impending birth, or any other cause, is an "animal at risk". Some animals at risk are unfit to be transported. Others can be transported providing special precautions are taken. The "Producer Guidelines for Transporting Compromised Cattle, Sheep and Goats" at the end of this section provide recommendations which can assist in the decision as to the proper handling of goats that fall within this category.

- 6.10.1 Prior to transport, animals should be in good physical condition and health. Animals that are sick, injured, disabled or fatigued and that cannot be moved without causing additional suffering are unfit for transport and must not be loaded for transport.
- 6.10.2 Transportation within 2 weeks prior to, and after, kidding should be avoided. Pregnant does must not be transported if it is likely that they will give birth during the trip.
- 6.10.3 If a goat becomes unfit during transport, it must be segregated from other animals and taken to the nearest suitable place at which it can receive proper care and attention. Veterinary advice should be sought. A system of early identification of injured animals prior to unloading and an action plan must be in place and known to all involved parties. (See Appendix F and G).
- 6.10.4 In the case of a roadside emergency such as a vehicle accident, immediate action should be taken to minimize animal suffering. Veterinary advice should be sought.
- 6.10.5 Special care should be taken in transporting animals at risk, such as partitioning separately or loading in a separate compartment. Animals at risk must be loaded and unloaded in a way that avoids additional suffering. They should be loaded last and unloaded first.
- 6.10.6 Pregnant or lactating does are especially susceptible to injury, infectious diseases such as mastitis, and metabolic disorders such as pregnancy toxemia. Lactating does in transport should be milked as required.
- 6.10.7 Kids less than seven (7) days of age should not be transported to auction markets.
- 6.10.8 Any goat, which dies in transit must be removed at the first opportunity, in accordance with provincial and federal legislation.

6.11 Transportation Emergencies

- 6.11.1 In the case of traffic accidents, breakdowns or other delays, prompt action should be taken to ensure the well being of the goats. Emergency procedures are listed in Appendix F of this code. Further

details are available in Appendix 3 of the *Recommended code of practice for the care and handling of farm animals - Transportation*.

Table 3: Signs of Animal Discomfort During Transport

Problem	Warning Signs
Overcrowding	<p>Load will not 'settle', animals continues to scramble for footing and the load continues to be noisy for prolonged periods of time.</p> <p>Animals involuntarily lie down and are unable to get up.</p>
Overheating	<p>All species will pant when overheated, animals standing with neck extended with open mouthed breathing is a dangerous situation.</p>
Cold Exposure	<p>Animals should remain dry during transport.</p> <p>All species will eat available bedding when cold stressed.</p> <p>Fluid frozen to the face or nostrils.</p>

Source: *Recommended Code of Practice for the Care and Handling of Farm Animals - Transportation* Page 9

OMAF (Food Inspection Branch):
1-888-466-2372 extension 6-4230
CFIA (Transportation Emergencies): 1-877-814-2342
OFAC (Animal Care Help Line): 905-821-3880
Ontario SPCA: 1-888-ONT-SPCA (668-7722)

PRODUCER

Guidelines for Transporting

Compromised Cattle, Sheep & Goats

Transport With Special Provisions

(See below ●, ▲ and reverse for transport regulations)

Slaughter (prompt & direct)

- Abscess
- Blind*
- Cancer eye (eye intact)
- Lameness class 1/2/3 (see reverse)
- Left/right displaced abomasum (without weakness, toxicity)
- Lumpy jaw
- Penis injuries
- Pneumonia (without fever)
- Prolapsed vagina or rectum

Nearest Suitable Slaughter Facility (immediate / emergency situations)

- Advise inspector at the destination plant.**
- Ambulatory fractures (ie. limo. few)*
 - Bloat*
 - Hardware with localized signs
 - Intestinal accidents
 - Recent injury*
 - Urethral blockage (acute)*

*Animals must travel in a small compartment, either individually segregated or with one quiet animal.

Non-ambulatory ▲

A veterinary certificate is required for ALL non-ambulatory animals suitable for transportation and slaughter.

- Unable to stand without assistance, or unable to move without being dragged or carried. Commonly called "downers"
- Lameness class 4/5 (see reverse)
- An animal should also be certified if at risk of going down en route.

Delay Transportation & Re-assess

- Exhaustion
- Calving/lambing/kidding
- Weakness
- Fever (cattle > 102.5F, 39.1C; sheep/goats > 103.0F, 39.6C)

Euthanasia

- Arthritis with multiple joints
- Cancer Eye (severe)
- Cancer/leukosis (extensive)
- Extremely Thin
- Nervous Disorders (ie. rabies) ●
- Pneumonia (unresponsive with fever)
- Prolapsed uterus
- Water belly

■ Contact CFIA

▲ Consider slaughter at the farm if the animal is suitable for owner consumption. Must comply with provincial regulations.

● Compromised animals – only slaughter if – a. All drug withdrawal times are met. b. The animal is fit for human consumption. c. The animal can be humanely loaded and transported. If these conditions are not met, the animal must be humanely euthanized and disposed of according to federal, provincial and municipal regulations

PLEASE CONTACT YOUR VETERINARIAN FOR ADVICE OR ASSISTANCE

Guidelines for Transporting Compromised Cattle, Sheep & Goats

Federal Transportation Regulations

DO:

- Segregate animals of different species, or substantially different weights and ages, or if incompatible by nature.
- Provide for proper ventilation, drainage and absorption of urine.
- Have sufficient headroom for animals to stand in a natural position.
- Either strew the vehicle with sand or have the vehicle fitted with safe footholds, in addition to appropriate bedding.
- Ensure that animals unloaded for feed, water and rest remain at least five hours and longer, if necessary, for all animals to receive food and water.
- Ensure that transported animals too young to exist on hay and grain are provided with suitable food and water at intervals of no more than 18 hours.
- Ensure that animals segregated in trucks receive extra protection from cold and wind chill; supply ample bedding.

DO NOT:

- Transport a sick or injured animal where undue suffering may result, or when the animal is liable to give birth during the journey.
- Continue to transport an animal that is injured, becomes ill, or is otherwise unfit to travel beyond the nearest place it can be treated.
- Mishandle an animal on loading or unloading.
- Use goads or prods on the face, anal, udder or genital area.
- Load or unload animals in a way that would cause injury or undue suffering.
- Crowd animals to such an extent as to cause injury or undue suffering.
- Transport livestock in trailers not designed for safe handling of that species or class of livestock.

Source: *Transporting Livestock by Truck (CFIA)*

Lameness Classes

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

Class 1

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

Class 2

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

Class 3

Requires assistance to rise but can walk freely. *Segregate. Load in rear compartment.*

Class 4

Requires assistance to rise; reluctant to walk; halted movement. No steep ramps. *Segregate. Load in rear compartment.*

Class 5

Unable to rise or remain standing. Animal should not be moved, except with veterinary certification, using specialized equipment and in accordance with provincial regulations. *Euthanasia or emergency on-farm slaughter.*

Endorsed by:

Ontario Association of Bovine Practitioners

Further Information

Health of Animals Regulations (Federal) www.inspection.gc.ca

Recommended Codes of Practice for the Care and Handling of Farm Animals www.care-crac.ca

OMAFRA Agricultural Information Contact Centre (1-877-424-1300) www.gov.on.ca/OMAFRA

OFAC www.ofac.org/agrifood.html

This pamphlet was produced by the Ontario Humane Transportation Working Group [Members: Canadian Food Inspection Agency (CFIA); Ontario Farm Animal Council (OFAC); Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA); Ontario Society for the Prevention of Cruelty to Animals (Ontario SPCA); Ontario Veterinary Medical Association (OVMA); and the insurance industry].

To order more copies, please contact Ontario Farm Animal Council: (905) 821-3880

Section 7 ◊ Livestock Markets

7.1 Facilities

All livestock auction market operations must comply with applicable legislation.

- 7.1.1 Secure footing for all goats should be ensured.
- 7.1.2 Loading ramps, chutes and other holding facilities should be solidly constructed and well maintained.
- 7.1.3 Facilities should be routinely inspected to remove hazards. Holes in flooring, broken boards and bars, protruding pieces of angle iron, nails or long bolts around the chute and corrals are not acceptable.
- 7.1.4 All handling and holding facilities should be regularly cleaned and holding facilities supplied with fresh bedding.
- 7.1.5 Loading ramps should provide secure footing for goats and kids.
- 7.1.6 Chutes with solid walls work best for efficient movement of goats.
- 7.1.7 The use of overhead catwalks is encouraged wherever possible to minimize the disturbance to the animals.
- 7.1.8 All pen floors must be hard-surfaced, properly drained, and provide good footing. The slope of the floor in individual holding units should not be less than 2% or more than 4%, 1.75 - 3.75 cm/metre (3/4 to 1-1/2 inches/yard). Inside drainage grates, where required, should be at the side of the pens.
- 7.1.9 Drainage grates installed in areas to which goats have access should have perforations no wider than 2 cm (3/4 in.) in minor dimension. It is recommended that new or renovated facilities locate floor drains in such a way as to minimize the need for animals to cross them.

- 7.1.10 To encourage the safe and efficient movement of goats, adequate and proper lighting is required over alleyways, loading ramps, holding pens, and the entrance to transport vehicles. While goats tend to move toward light, care must be taken neither to shine lamps directly into the animals' eyes nor to create shadows across their path.
- 7.1.11 Holding pens should provide animals with access to clean, ice-free water.
- 7.1.12 Goats held for more than 24 hours must be provided with adequate feed and water in a bedded area that has sufficient room to allow all animals to lie down comfortably at the same time and in which the feed cannot become contaminated. Consideration must be given to minimize the stay at the auction market for young animals that are milk fed.

7.2 Injured, Sick and Disabled Goats

- 7.2.1 All goats should be inspected on arrival at the marketing facility. Any indication of abuse or neglect should be reported to the appropriate authority.
- 7.2.2 Market operators should refuse to accept for sale, goats that are injured, sick or disabled and unfit for transport. They should encourage and facilitate the humane movement of injured and disabled goats directly to packing plants or, if this is not appropriate, their humane destruction.
- 7.2.3 Distressed goats that are unloaded should be held separately in appropriate pens.

7.3 Holding and Handling

- 7.3.1 All employees working with goats should be instructed in the basics of handling techniques (see Section 4.1). They should understand principles of goat behaviour. Employers have an obligation to train all employees in the safe and humane handling and treatment of goats. Employers should hold group discussions with employees using available educational material and should instruct them on their responsibilities and obligations. (Refer to Section 4.1 for recommendations on Supervision and Handling).

- 7.3.2 Goats should be loaded, unloaded and moved through facilities patiently and as quietly as possible to reduce stress and injury and to make the job safer and more efficient.
- 7.3.3 To reduce stress and prevent injury to goats, pens should be large enough to allow for adequate space to avoid overcrowding.
- 7.3.4 Pen walls should be high enough to prevent goats from attempting to jump out. Solid walls are recommended, but if planks are used, they should be no more than 4" apart.
- 7.3.5 A range of pen sizes should be available to minimize the need to mix various classes and lots of goats. In larger pens, adjustable dividing gates should be used to reduce mixing of goats.
- 7.3.6 Vehicles and docks must always be aligned. To accommodate vehicles of varying heights, unloading docks of different heights or adjustable ramps should be provided. There must be no unprotected gaps between the vehicle and the platform (bottom and sides).
- 7.3.7 Goats may feel trapped and behave unpredictably if they see a dead end. Goats should be able to see one pathway of escape ahead. Loud, high or unfamiliar noises may also cause goats to balk and should be prevented.
- 7.3.8 Electric prods must never be used on goats.
- 7.3.9 Dogs should be kept away from goat handling areas unless they are trained to move goats and are being used for that purpose.
- 7.3.10 Holding pens should provide animals with access to clean water.
- 7.3.11 Every animal that is a potential danger to other goats should immediately be segregated.
- 7.3.12 Adequate shelter from adverse weather and precipitation should be provided for all goats, with particular attention to young kids and lactating does.
- 7.3.13 Kids under seven (7) days of age should not be accepted for sale.

Section 8 ◊ Processors

8.1 General

- 8.1.1 Operators of slaughtering facilities are fully responsible for humane pre-slaughter handling and for the humane stunning and slaughter of goats on their premises.
- 8.1.2 Anyone who observes a violation of humane handling and related regulations, such as overcrowding, careless exposure to adverse weather, or other circumstances that result in unnecessary suffering, should report it immediately to both plant management and appropriate authorities.

8.2 Unloading

- 8.2.1 Unloading areas should be maintained in a clean condition. Facilities must provide secure footing and not cause injury to animals. A uniform floor surface is recommended.
- 8.2.2 Unloading should take place as soon as possible after arrival of the transportation vehicle. The packer, the trucker, and the producer should consult to prevent unnecessary delays.
- 8.2.3 It is preferable to have a flat landing surface at ramp or dock level.
- 8.2.4 Vehicles and docks must always be aligned. To accommodate vehicles of varying heights, unloading docks of different heights or adjustable ramps should be provided. There must be no unprotected gaps between the vehicle and the platform (bottom and sides).
- 8.2.5 Receiving areas should have adequate and uniform lighting, with no bright spots or contrasting shadows.
- 8.2.6 Obviously injured goats or goats unable to move should be unloaded in a way that causes them the least suffering.

8.2.7 Downers should undergo veterinary evaluation before being unloaded. Because humane considerations make the presence of a downer an emergency situation, in those instances where a veterinarian is not readily available, an inspector may make the evaluation, subject to provincial legislation.

8.2.8 The most desirable means of handling downers is to stun them on the vehicle under the supervision of a veterinarian or inspector, remove them from the vehicle and slaughter them before recovering consciousness. Otherwise, downers may be off-loaded by means of a stretcher, cage or similar equipment, if properly constructed and if the design of the vehicle and size of the goat permit them to be moved without undue pain or suffering. Downers off-loaded in this manner should be dealt with as determined by a veterinarian as soon as possible.

8.3 Handling

8.3.1 Goats should be moved through facilities patiently and as quietly as possible to minimize stress and prevent injury and to make the job safer and more efficient. Sufficient time should be allowed to keep pace with plant requirements without having to put pressure on either the goats or their handlers.

8.3.2 To encourage the safe and efficient movement of goats, adequate and proper lighting is required over alleyways, ramps and holding pens. While goats tend to move toward light, care must be taken neither to shine lamps directly into the animals' eyes nor to create shadows across their path. It is recommended that floor drains be located in such a way as to minimize the need for animals to cross them.

8.3.3 Electric prods must never be used on goats.

8.3.4 Goats should be segregated from other species of food animals. Every animal that is a potential danger to other goats should immediately be segregated.

8.4 Alleys and Chutes

8.4.1 Alleys and chutes should be well illuminated.

- 8.4.2 All floors of alleys and chutes should be hard surfaced, properly drained, and treated to prevent animals from slipping. They must be graded gently to provide good footing.
- 8.4.3 Goats may feel trapped and behave unpredictably if they see a dead end. Goats should be able to see one pathway of escape ahead. Loud, high or unfamiliar noises may also cause goats to balk and should be prevented.
- 8.4.4 The provision of solid sides for chutes, ramps, alleys and pens is helpful. Sides should be high enough to prevent entrapment and escape.
- 8.4.5 Protruding objects, such as nails and bolts, which might cause injury, are not permitted.

8.5 Housing

- 8.5.1 Sufficient pens should be available to prevent overcrowding, to permit necessary segregation of animals, and to enable all animals to lie down comfortably at the same time.
- 8.5.2 All floors of pens should be hard surfaced, coarse textured and properly drained to prevent slipping, and graded gently to provide good footing. The slope of the floor in individual holding units should be between 2% and 4% (2 - 4 cm/m/ 3/4 – 1 ½ inches/yard). Drainage grates, where required, should be at the side of the pens.
- 8.5.3 Holding facilities should protect goats adequately from adverse weather.
- 8.5.4 Every holding area should be adequately ventilated to minimize distress to the animals and excessive accumulation of odours and condensation.
- 8.5.5 Holding pens should provide animals with access to clean ice free water.
- 8.5.6 Goats held for more than 24 hours must be provided with adequate feed in a bedded area, sheltered from adverse weather, that has sufficient room to allow all animals to lie down comfortably at the same time and in which the feed cannot become contaminated.

8.6 Injured, Sick and Disabled Goats and Special Handling

- 8.6.1 Goats that are obviously sick, injured, or disabled must immediately be separated from healthy animals.
- 8.6.2 Equipment should be provided for the conveyance of non-ambulatory animals within the plant to prevent undue suffering. Animals must not be dragged.

8.7 Stunning and Slaughter

- 8.7.1 Selection and training of personnel are the most important factors in ensuring that slaughter is humane.
- 8.7.2 No goat shall be slaughtered without first being rendered unconscious by an experienced person using an approved, humane method with the exception immediately following:

Animals that are ritually slaughtered in accordance with established religious laws, without stunning, must be properly restrained and qualified, experienced persons must carry out the slaughter.

- 8.7.3 Hoisting of conscious goats is not permitted.
- 8.7.4 Stunning pens should be designed and constructed to permit easy and safe stunning.
- 8.7.5 Stunning equipment must be well maintained and must be used only by operators who are properly trained. They must have the ability to use such equipment without causing the animals avoidable pain and suffering and by rendering the animal unconscious immediately.

8.8 Education of Personnel

- 8.8.1 Employers have an obligation to train employees properly on humane handling, equipment use and livestock care. They need to ensure that employees follow those principles at all times. Employers should hold group discussions with their employees to instruct them on their responsibilities and obligations. Educational material on these topics should be made available to employees. Knowledge

of basic animal behaviour helps employees to understand how to best carry out their jobs and promotes tolerance when handling goats.

Section 9 ♦ Research

The Canadian goat industry recognizes the importance of research on issues related to the welfare of goats. The industry will continue to support research and the technology transfer of methods that enhance production and goat welfare.

As new technologies develop and research is completed, recommendations for this Code will continue to evolve.

Research needs relevant to this code includes:

1. Assessment and improvement of handling/transport procedures and equipment to minimize stress.
2. Refining of loading densities for transport.
3. Maximum acceptable travel times and appropriate feeding, watering and resting for goats.
4. Assessment of predators and the best methods to improve predator control.
5. Acceptance of the research of other countries for medications or medical products.
6. Establish an acceptable database of information on approved products for goats.
7. Product and dosage modes of administration, withdrawal times and adverse reactions.
8. Diseases with socio-economic impact (i.e., CAE, Q Fever & Johnes) to provide early identification.

APPENDICES

Appendix A ♦ Body Conditioning Scoring (BCS) of Goats

Body Condition Score

Body condition scoring (BCS) is a valuable management skill. BCS is a visual and hands-on evaluation of muscle mass and fat under the skin. The lumbar method is limited in dairy goats as they store more fat in the abdomen than under the skin. Meat goats tend to store fat under the skin; the amount related to the amount of dairy breeding in their background. Because of this, BCS used both the brisket and lumbar region. At drying-off a dairy goat's BCS should be 3 to 3.5, at kidding 3 to 3.5, and during her lactation her BCS should not drop more than 1.5 points. A BCS of 3 is ideal for both meat and dairy at breeding.

Chest Floor



BCS 1 – Skeletal

Brisket: Bones felt, movable callous

Present

Lumbar: Emaciated, skin stretched over a skeleton

BCS 2 – Fair

Brisket: Callous small, small fat pad under skin

Lumbar: Some muscle present,

Skeleton still obvious

BCS 3

Brisket: Ridge between fat and muscle and bone, fat over muscle

Lumbar: Firm muscle 60 mm of fat

BCS 4

Brisket: Bones not palpable, muscle ridge still felt

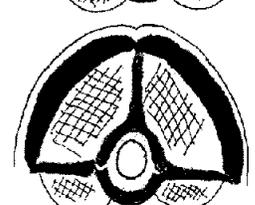
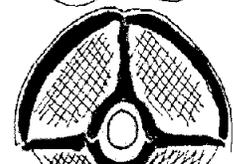
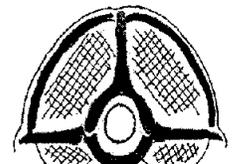
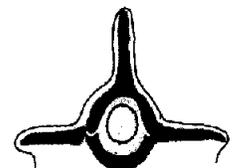
Lumbar: Good muscle and fat cover

BCS 5 – Obese

Brisket: Muscle not felt, fat under the skin is not movable

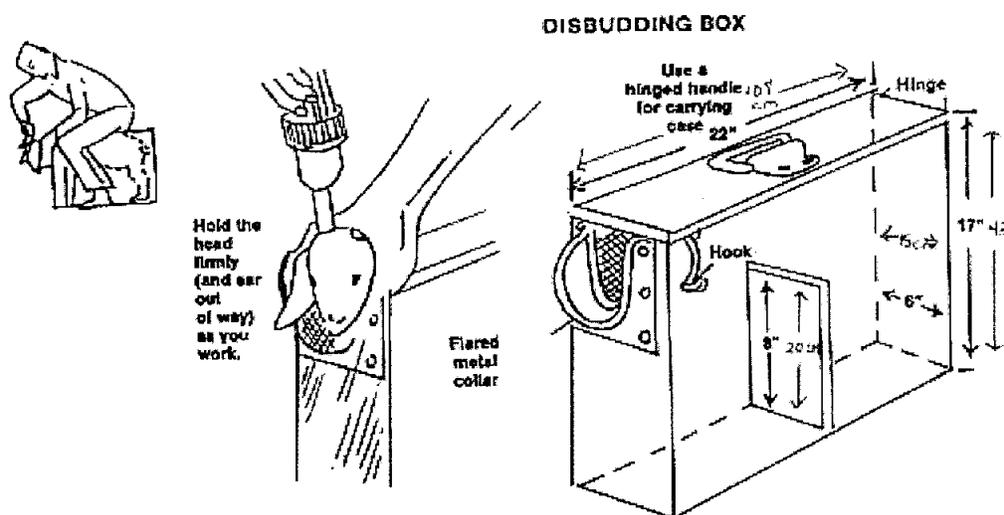
Lumbar: Abundant fat under the skin

Vertebrae

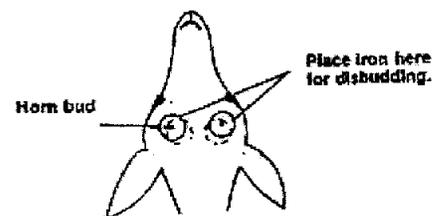


Adapted from: *Goat Production Guide*, Meg Smart, DVM Phd.

Appendix B ♦ Disbudding of Goats



When the kids are born, notice the way the hair grows on the head, while they are still wet. If the hair lies flat or there is a centre swirl the kid is likely hornless. If there is a swirl or curl of hair on each side of the head where horns would grow, the kid is horned. If you press on the curl you will feel the tiny horn bud.



Disbudding can be done as early as three days of age to ten days of age. Do not wait too long before disbudding or there will be a much greater chance of scurs developing. Scurs are the growth of any horn tissue, which is not killed during disbudding. There is also a greater chance of kids going into shock after disbudding when they are 2 or 3 weeks old.

Electric disbudding irons can be purchased from any supply store. The tip should be $\frac{3}{4}$ " to 1" across. If you purchase a calf disbudding iron, be sure to get one with the alternate small tip.

The iron should be heated to a cherry-red and will burn a dark ring on a piece of wood in 1 second.

1. Shave the hair off the horn bud. This allows you to better see what you are doing and cuts down on smoke. Clip closely an area about the size of a half-dollar. If the kid is horned, you will find a bare spot about $\frac{1}{4}$ " in diameter.

2. A disbudding box is very convenient for restraining a kid. If you do not have one, hold the kid firmly between your knees, holding the head in one hand, with the ears held back. The other hand grasps the heated iron.
3. Apply the hot iron over the horn bud with a steady, even pressure, slowly rotating the iron. Burn for no more than 10 seconds (counting one thousand one, one thousand two). Check to be sure that the skull isn't getting too hot.
4. Burn some more if necessary until a copper ring shows all around the horn bud. The horn should pop right up so it can be lifted off. Check to be sure that no raw tissue is left around the edge. Touch up with the hot iron if necessary. You should see the skull when the horn bud is removed.
5. In about three weeks or more, the scabs will come off which heals quickly. Check disbudded kids for horn growth (scurs) at 3 months of age. Reapply heated iron, if necessary, to remove horn tissue. Caustic pastes are not recommended because of the danger of blindness if the kid rubs caustic into its eye. Burns also occur in ears.

Adapted from: *the University of Guelph Independent Study*

Appendix C ◊ Crutching of Fibre Goats

- AC.1 Special goat combs for the shears are to be used. These combs have teeth closer together and tips tapered back to be safer for the goat.
- AC.2 Goats to be crutched should be leaning slightly to the left for a right-handed shearer (Figure 1).
- AC.3 The first stroke should start along the right flank and follow the curve of the belly to the left flank (Line 1, Figure 2).
- AC.4 This stroke is made with the hand piece on an angle—the lower comb tooth is on the skin and the top tooth just out of the fibre (Figure 2A). This will leave a smooth edge on the fibre remaining on the belly with no pieces hanging down that a kid will find to suck on.
- AC.5 The second stroke, and the third stroke if necessary, are made with the comb flat on the skin as when shearing. Make sure all fibre is cleared from the front of the udder at this stage and **above all, protect the teats when working close to them**. You may feel more comfortable taking short strokes in this area, but be sure the udder area is protected.
- AC.6 Any fibre hanging down in the goat's right flank is now taken off and the hand piece is run out along the top edge of the back leg to trim off locks on the front of the leg (#1, Figure 3). This stroke is made with the hand piece level (Figure 3A) and the right side of the comb out of the fibre, not flat in the skin as when shearing.
- AC.7 The inside of the hind legs are now cleaned. Experienced shearers will probably combine strokes 2,3,5,6 and 7 into two or three strokes but beginners will probably find it easier and safer to make the strokes as shown. Stroke number 4 cleans the flank and top of the left leg similar to the first stroke on the right leg.
- AC.8 The goat is now let down more on its left side and the remaining strokes travel from the back of the goat into the fibre to give a tapered effect and not leave bits and pieces hanging. Pressure put on the stifle joint in the flank (arrow in Figure 4) will straighten this leg for easier shearing.

- AC.9 The first stroke is from the top of the tail down over the tail, being careful not to run into the vulva area.
- AC.10 The second stroke is now curved from the edge of the tail around the back edge of the leg to the hock with the bottom tooth on the coat and the top tooth out of the fibre.
- AC.11 The third stroke is flat on the goat's skin and the hand piece should be rolled to stay on the underside of the leg, otherwise, if the goat has its leg slightly forward, this stroke could cut off the teats if not enough care is taken.
- AC.12 The fourth stroke starts from the lower edge of the tail and follows out on the lower leg with the fifth stroke curving out around to the hock to match the second stroke in Figure 4. Figure 5 shows the finished product.



Figure 1: The position. Protect the teats

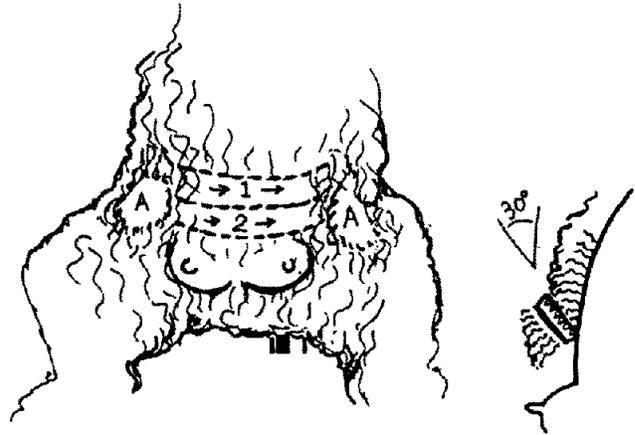
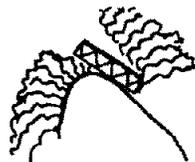


Figure 2

2A



Figure 3



3A

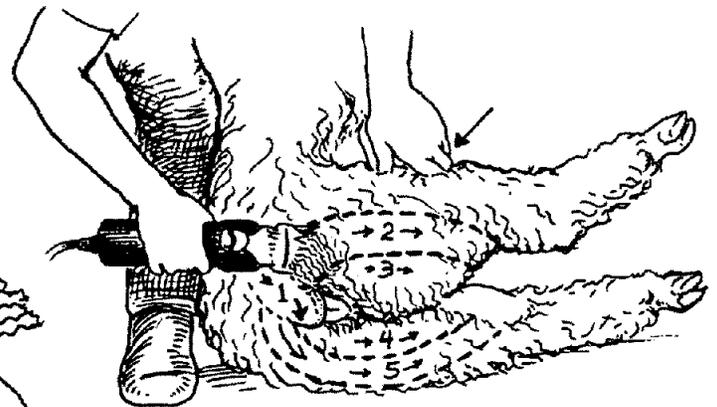


Figure 4

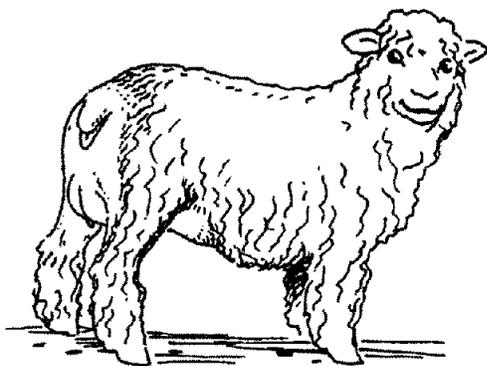


Figure 5: The finished product.

Illustrations by Sara Emond, Anima Graphics, Alberta.

Adapted from: *Crutching Sheep*
by Les Jones, Ontario Sheep
Consultant, Region 3, Ontario
Ministry of Agriculture and
Food, 1993

Appendix D ♦ Guidelines for Humane Killing of Goats by Firearms

GENERAL CONSIDERATIONS

For an animal to receive a humane death it should be rendered unconscious as rapidly as possible. Shooting is a humane method of killing provided that the shot penetrates the brain. To ensure this, the weapon used must be fired with the muzzle placed close to the animal's head, pointing in the required direction. The animal should be adequately restrained to ensure proper placement of the shot.

FIREARMS

Shooting an animal should only be done by persons well versed in handling firearms and licensed to use firearms. The firearms that can be used for humanely shooting an animal from close range would be either a 22-calibre rifle with long rifle mushroom shells or a 410-gauge shotgun with slugs or pellets. In most cases, the barrel of the firearm should be 3-5 centimetres (1-2 inches) from the head if using a rifle, pistol or 410 gauge shotgun or 1-2 meters (3-6 feet) if using a larger gauge shotgun or rifle (e.g. A .308 rifle).

The animal should be treated in a calm and reassuring manner to reduce any anxiety the animal may have. An animal that becomes tense or excited will be more difficult to restrain and to kill humanely.

GOATS/SHEEP

The head of the goat should be secured with a halter, and food offered to the animal.

Treat all goats as though they had horns.

Goats/Sheep with Horns

When the animals have horns, the approach should be from the rear and the aim directed between the base of the horns towards the mouth (figure 1). Alternatively the firearm can be aimed from the front just above the eyes on the midline, shooting towards the spine (figure 2).

With horns.



Figure 1



Figure 2

Source: Longair, J. et al. *Guidelines for euthanasia of domestic animals by firearms*. Can. Vet. J. 1991, 32:724-726

Appendix E ◊ Reportable Diseases

The following are reportable diseases, for the purpose of the current section 2 of the *Health of Animals Act*, which may affect goats.

- Anaplasmosis
- Anthrax
- Brucellosis
- Bluetongue
- Foot-and-mouth disease
- Goat Pox
- Peste des Petits Ruminants
- Rabies
- Vesicular stomatitis
- Rinderpest
- Scrapie
- Tuberculosis

Source: Canadian Food Inspection Agency, *Reportable Diseases Regulations*, February 2001

Zoonotic Diseases: where goats are one of the principle animals involved (and are known to occur in Canada). Zoonotic diseases are those which can be contracted by humans, from animals.

- Anthrax
- Campylobacter
- Contagious Ecthyma
- Cryptosporidiosis
- Leptospirosis
- Psittacosis (chlamydia)
- Q-fever
- Rabies
- Toxoplasmosis
- Ringworm

Source: *The Merck Veterinary Manual*, 1998

Appendix F ♦ Emergency Procedures During Transportation

Please Post in Trucks

Emergency procedures to be followed by drivers in the event of a breakdown, an accident, or any other delay during transit.

1. Telephone home office immediately to report the emergency situation.
2. During business hours, telephone the nearest slaughterhouse as well as the manager of the receiving plant or shipper and receiver.
3. Telephone the receiver. (Attach night telephone numbers).
4. If necessary, arrange for the use of another vehicle to move the load to a sheltered area or to the point of destination.
5. During extreme hot or cold weather, seek shelter for the load until the emergency situation is over.
6. Seek the advice of a veterinarian in the event of distressed or seriously injured goats.
7. Do something! Use common sense. The comfort and safety of the animals must be kept in mind at all times.

Adapted from: *Procedures Bulletin*, Ontario Trucking Association

Appendix G ◇ Summary of *Health of Animals Regulations* for Transport of Livestock

If you truck livestock within, out of or into Canada, you must follow the *Regulations of the Health of Animals Act*. You can keep this convenient summary of the regulations in your vehicle at all times. It is not an official document.

You must not:

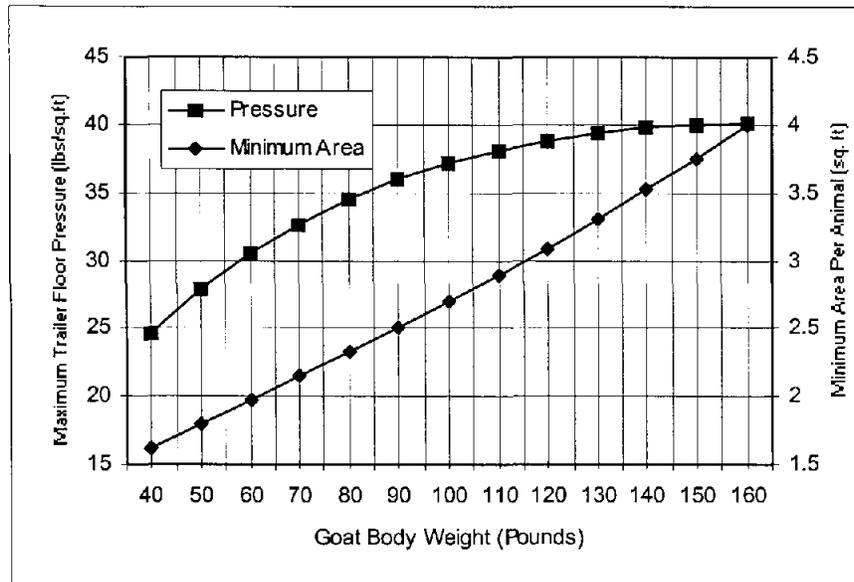
- Transport a sick or injured animal where undue suffering will result or when the animal is liable to give birth.
- Continue to transport an animal that is injured, becomes ill or is otherwise unfit to travel
- Beat an animal on loading or unloading, movement may be directed with an approved goad or prod.
- Load or unload animals in a way that would cause injury or undue suffering.
- Crowd animals to such an extent as to cause injury or undue suffering.
- Transport animals if injury or suffering is likely to be caused by inadequate construction of the vehicle, insecure fittings, undue exposure to the weather or inadequate ventilation.
- Use ramps, gangplanks or chutes that are inadequately constructed or maintained and would be likely to cause injury or undue suffering to animals.
- Confine cattle, sheep goats or other ruminants in a motor vehicle for longer than 48 hours unless they can reach their final destination in 52 hours.
- Load an animal without providing feed and water within five hours before being loaded, if the expected duration of the animal's confinement is longer than 24 hours from the time of loading.

You must:

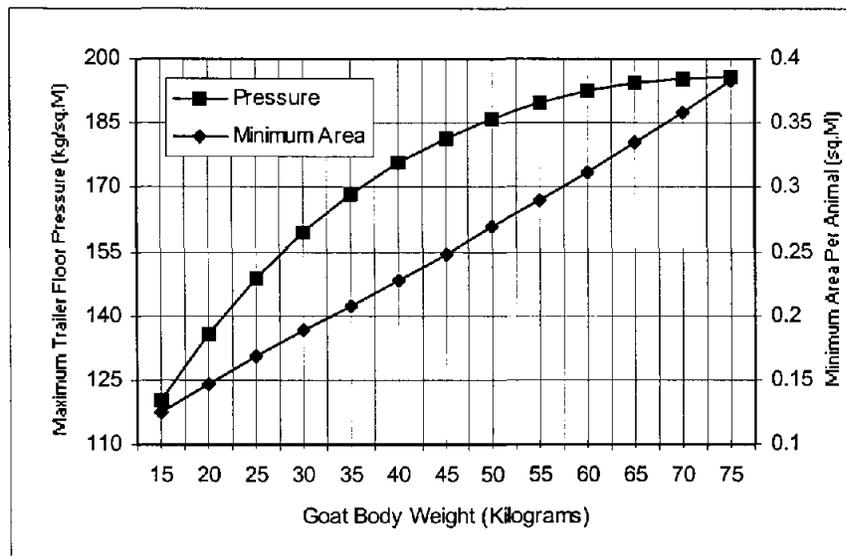
- Segregate animals incompatible by nature or by virtue of substantially different weight or age
- Allow animals to stand in a natural position
- Provide for drainage and absorption of urine
- Either strew the vehicle with sand or have the vehicle fitted with safe footholds in addition to adequate bedding
- Ensure that animals unloaded for feed, water and rest remain not less than 5 hours and for at least enough time to allow every animal in the group to reach the feed and water
- Keep the following record, if engaged in extra-provincial or international transportation: name and address of shipper, name and address of driver; name and address of consignee; number and description of livestock; registration number of motor vehicle; time and place loaded; time and place of feed, water and rest; time unloaded at destination
- Keep these records for 2 years and make them available to an inspector on demand.

Source: *Agriculture and Agri-Food Canada*

Appendix H \diamond Minimum Space Allowances for Goats in Transportation



Maximum trailer capacity for goats transported standing based on average individual animal weight. A 45 kg goat at 181.5 kg/m² has .25m² of floor space. Reduce loading density to 85% of maximum in hot humid weather and for trips in excess of 24 hours to allow for goats to lie down.



Maximum trailer capacity for goats transported standing based on average individual animal weight. A 90 pound goat at 36 lbs./ft² has 2.5 square feet of floor space. Reduce loading density to 85% of maximum in hot humid weather and for trips in excess of 24 hours to allow room for goats to lie down.

Appendix I ♦ Wind Chill Factors

Wind speed (km/h)	Actual air temperature (°C)						
	10	4	-1	-7	-12	-18	-23
	Wind chill factor						
8	9	2	-3	-8	-15	-21	-26
16	4	-2	-8	-15	-22	-29	-34
24	2	-5	-12	-21	-28	-34	-41
32	0	-8	-16	-23	-31	-37	-45
40	-1	-9	-18	-26	-33	-39	-48
48	-2	-11	-21	-28	-36	-42	-51
56	-3	-12	-21	-29	-37	-44	-54
64	-3	-12	-22	-29	-38	-47	-56
72	-4	-13	-22	-30	-39	-48	-57
80	-4	-13	-23	-31	-40	-48	-58

Appendix J \diamond Definitions

ADDITIVE	An ingredient or combination of ingredients added to a basic feed mix to help fulfil a specific need.
BUCK	A mature intact male goat.
BUCKLING	A young intact male goat.
CHEVON	This is the term used for goat meat.
CLAIMING PEN	A small pen-like enclosure into which a doe and her newborns are placed immediately after birth. This allows bonding to occur between mother and kids without disruption and interference from other herd-mates.
COMPROMISED ANIMAL	An animal with reduced capacity to withstand stress due to injury, fatigue, infirmity, poor health, distress, very young or old age, impending birth or any other cause. Some animals at risk are unfit to be transported.
CONTROL FEED	(limit feed) A term used to describe the practice of offering only the amount of feed(s) that meets the daily nutritional needs of an animal, in multiple small feedings spaced throughout the day.
CRUTCHING	The process of clipping or shearing fleece from the dock, vulva and udder regions of the female fibre goat or sheep prior to breeding and kidding. (Handbook of livestock management)
DIET	The feed ingredient or mixture of ingredients including water which is consumed by animals.
DISTRESSED GOAT	The animal is completely stressed. An extreme strain upon the normal physiological state of the animal impacting on psychological processes and functions of the body. Will likely cause pathology or diseased states or weaken the normal body defenses. Changes in posture and movement are apparent. There is a general free reluctance to move. There may be a change in facial expression and likely vocalization in response to pain. Grinding of the teeth and grunting are also heard. Repeated standing up and lying down, tail wagging, neck extension, dorsal lip curling, kicking, rolling and hyperventilation may also be observed.
DOE	A mature female goat
DOELING	A young female goat.
DOWNED	When an animal goes down under foot or fallen, and because of crowding, poor footing, injury or disease cannot get back up. (See also non-ambulatory animal).
DOWNER	This is the term used to describe an animal that has been downed. A 'downer' animal usually cannot get up and walk by itself.

ELECTRONIC MICROCHIP IMPLANT

An electronic microchip is a very small capsule, about the size of a grain of rice, which contains a computer chip that stores a unique alphanumeric code. The microchip is injected under the skin of an animal with an instrument much like a hypodermic needle. Hand held scanners can read the unique code contained in the microchip to identify the animal.

EMERGENCY SLAUGHTER

This is synonymous with euthanasia. Emergency slaughter, in an inspected facility, is allowed under some provincial regulations to enable salvage of livestock that would be lost if not processed promptly. Only animals that show a reasonable chance of being approved should be admitted to slaughter. The cost of emergency slaughter, unscheduled clean up, use of manpower and inspector will be charged to the livestock owner. Obvious condemnations such as moribund animals, can be condemned on pre-mortem inspection, shot but not bled and disposed of to Dead Stock. The slaughter plant operator must make arrangements with the veterinary inspector assigned to that slaughter plant. It is the producer's responsibility to ensure handling and transportation to slaughter is carried out in a humane manner. Veterinary inspectors are obliged to be physically present for the duration of slaughter and dressing unless a CFIA inspector is present. All animals slaughtered on an emergency basis shall be "held" and checked for residues.

ETIOLOGY

This is all the cases of a disease or abnormal condition.

EUTHANASIA

The act or practice of killing for reasons of mercy, animals that are hopelessly sick or injured.

FREE CHOICE

The term used to describe the practice of allowing animals unlimited access to one or all feedstuffs.

FOSTERING

The practice of getting a doe to accept a kid, other than her own. This enables extra kids to be raised by a doe, rather than reared on a bottle. Fostering is usually practiced when a doe loses her offspring or has more milk than her own kid can consume.

FOSTERING STANCHION

A head-gate that allows the doe to be restrained and able to eat, drink and lie down while preventing her from injuring the kid, seeing or smelling it or refusing to let it nurse. Head-gates are often constructed at the front of a kidding pen.

HAND FEEDING

Providing a small amount of feed at one time, for example enough to meet the nutrient requirements for half a day or one day at a time. As opposed to free choice or self-feeding, in which a large amount of feed is always available to the animals.

HERD INSTINCT

The natural tendency of certain animals to congregate with their own kind.

HOOF CARE

The regular examination and trimming of the animal's hooves in order to maintain health of feet.

IMMUNO-COMPROMISED

This is the reduced resistance to disease.

KID

A young goat (under 1 year of age).

MARKETING DEMANDS

Those factors that influence the price received and include supply, demand, animal management and animal condition.

MASTITIS This is an infection via the streak canal (teat end) which can occur with improper milking, poor hygiene or self nursing.

OFFAL The viscera and trimmings of a butchered animal removed in dressing.

PUBERTY The age of puberty in goats is the time at which sperm is first produced in males and ova in females can be reached as early as 70 days.

RUBBER RING Is a specially made ring which is placed around the scrotum to castrate young males.

RUMINATION The act, in ruminant animals, of regurgitating previously eaten feed and chewing a soft mass of coarse feed particles called a bolus or cud. Each bolus is chewed for about a minute, then swallowed again. Ruminants may spend 8 hours or more per day in rumination. Coarse, fibrous rations result in more time ruminating.

SCOURABLE The term used to define marking paints used on the fleece for identification purposes, the paint will wash out during processing and not have harmful effects on the quality of the fleece.

SEGREGATION To keep animals apart, therefore avoiding physical or visual contact and interaction with each other.

SHEARING The process of removing the fibre coat from Angora and cashmere goats.

STANCHION A set of adjustable, upright partitions made from either wood or metal that close around a goat's neck, so the goat(s) can be temporarily held for such purposes as milking and feeding.

TETHERING 1) This is one means of controlling a goat's movement. It involves the use of a collar, several lengths of chain and either a tether stake (which has a freely revolving ring at its top) or a tensioned cable running between two stakes, that allows the goat to graze within a specific area. 2) to fasten or tie an animal with rope or chain so that it can move or graze within a very specific area. (Handbook of livestock management).

UNFIT FOR TRANSPORT

An animal that is sick, injured, disabled or fatigued and that cannot be moved without causing additional suffering and must not be transported.

WEANING The process for changing the diet of kids from liquid to dry feeds.

WETHER Is a castrated male goat.

Appendix K ♦ Summary of Acceptable Water Quality for Livestock

Element	Maximum Safe Level (mg/l)	Comments
Hardness	180	<input type="checkbox"/> Very hard, sum of calcium and magnesium in water <input type="checkbox"/> Soft water can be corrosive, and tends to leach Cu, Zn, Cd, from pipes, and carry toxic elements from pipes or soil
Total Dissolved Solids (TDS)	7,000 - 10,000	<input type="checkbox"/> The impact on production depends on mineral composition
Magnesium	800	<input type="checkbox"/> May be laxative
Sodium	800	<input type="checkbox"/> None
Calcium	1,000 - 2,000	<input type="checkbox"/> Can contribute to milk fever
Iron	175 - 300	<input type="checkbox"/> ≥ 1,500 can reduce dietary copper availability
Sulphates	<900	<input type="checkbox"/> Reduces copper availability <input type="checkbox"/> Associated with polioencephalomalacia (thiamin deficiency)
Nitrates (NO ₃)	<100	<input type="checkbox"/> Additive with nitrates in the diet <input type="checkbox"/> Decreases Vitamin A, E, iodine and phosphorous availability (species dependent)
Zinc	25	
Copper	0.5 - 1.0	<input type="checkbox"/> 30% of a sheep's daily requirement
Selenium	0.1	<input type="checkbox"/> 10 fold margin of safety
Chlorides	1000	<input type="checkbox"/> ≥ 250 causes corrosion of plumbing equipment
Mercury	0.01	
Lead	0.1	
Fluoride	<3.0	<input type="checkbox"/> Can cause mild mottling of teeth

Appendix L \diamond Poisonous Plants

Plant poisoning is relatively uncommon in goats but can occur under certain conditions.

1. **Starvation**
2. **Accidental**
3. **Boredom**
4. **Weather**

Plants can be grouped according to the poison they contain. If symptoms of poisoning should occur, it is recommended that a veterinarian be called as soon as possible.

It should be noted that most of these weeds are unpalatable and animals will not usually graze them if given the chance. One of the most important steps in preventing animal suffering or loss is good pasture management.

TYPE	SUMMARY	EXAMPLES	SYMPTOMS
Cyanogenic	These contain under certain conditions, prussic acid (hydrocyanic acid) which interferes with the oxygen carrying ability of the blood. The green leaves are fine but if wilting occurs by frost, storm damage or cutting changes, the glucoside in the leaves changes to hydrocyanic acid and sugar. The sweet wilted leaves are more attractive to animals. Leaves lose their poison after they become dry.	<input type="checkbox"/> Members of Prunus family of plants (wild cherry, peaches, plums and other stone fruits). <input type="checkbox"/> Sudan grass and sorghums are also cyanogenic when damaged or frozen <input type="checkbox"/> Choke cherry <input type="checkbox"/> Hemp <input type="checkbox"/> Laurel	<input type="checkbox"/> Onset is rapid with little outward symptoms
Alkaloid	As a rule these plants are very bitter and therefore unpalatable. Poisoning rarely occurs except in early spring when young plants are accidentally eaten.	<input type="checkbox"/> Water Hemlock (requires wet soil) <input type="checkbox"/> Poison Hemlock (dry land) <input type="checkbox"/> Nightshade family <input type="checkbox"/> Buttercup <input type="checkbox"/> Larkspur	<input type="checkbox"/> Digestive disturbances <input type="checkbox"/> Pale <input type="checkbox"/> Grating of teeth <input type="checkbox"/> Weak rapid pulse
Oxalate	This can occur from the leaves of rhubarb. Oxalates tie up blood calcium and cause symptoms similar to milk fever, followed by kidney damage.	<input type="checkbox"/> Rhubarb <input type="checkbox"/> Beet leaves <input type="checkbox"/> Swiss chard leaves <input type="checkbox"/> Mustard leaves	<input type="checkbox"/> Lassitude <input type="checkbox"/> Constipation <input type="checkbox"/> Stilted or wobbly gait <input type="checkbox"/> Glassy eyes
Nitrate	Poisoning can occur in hot dry weather from plants which normally can be safely consumed. The plants accumulate toxic levels of nitrates which are reduced to nitrites in the body. These nitrites combine with the hemoglobin in the red blood cells and limit its oxygen carrying ability.		<input type="checkbox"/> Shortness of breath from exercise <input type="checkbox"/> Severe drop in milk production with digestive upset colicky symptoms <input type="checkbox"/> Abortion
Photo-sensitizing	Plants cause white-skinned animals to become photosensitive. The skin becomes hypersensitive to the action of direct sunlight. The conditions under which this occurs are usually ideal weather when lush growth occurs and goats are literally stuffing themselves and being exposed to bright sunlight for at least half a day at the same time.	<input type="checkbox"/> St. Johnswort <input type="checkbox"/> Buckwheat <input type="checkbox"/> Alsike <input type="checkbox"/> Clover <input type="checkbox"/> Rape <input type="checkbox"/> Ornamental hyperciums	<input type="checkbox"/> White areas of the goat suddenly become sore <input type="checkbox"/> White skin may raise up and possibly slough off
Other Plants	Goats should not be fed clippings from ornamental plants. It would be wise to consider all ornamental shrubs, except roses to be poisonous.	<input type="checkbox"/> Lily of the Valley <input type="checkbox"/> Poison Ivy <input type="checkbox"/> Foxglove <input type="checkbox"/> Wild goldenrod	

Source: Dairy Goat Production, University of Guelph

Check with a provincial agricultural specialist for plants indigenous to that province.

Appendix M ♦ Participants

Representatives of the following organizations participated in this Code review. However, the Code does not necessarily have the unequivocal endorsement of any agency or individual.

<i>Organization</i>	<i>Representative</i>
OMAF	Earl Pollock (Chair) Anita O'Brien Gerrit Rietveld
Canadian Goat Society	Sharon Hunt (Secretary) Mary Lou Peters L. Brune – A.G.B.A.
Canadian Boer Goat Association	Cindy Hubble
CARC Canada Committee on Animals	S. K. Ho
Canadian Society of Animal Science	Paul Sharpe
Canadian Council on Animal Care	J. Wong G. Griffin
Canadian Veterinary Medical Association	M. Smart
Canadian Food Inspection Agency Animal Health Division	Gordon Doonan
Canadian Society of Agricultural Engineering	L. Donaghue
Canadian Meat Council	L. Campbell
Canadian Federation of Humane Societies	F. Rodenburg B. Van Tongerloo

Appendix N ♦ References and Further Reading

Handbook of Livestock Management Techniques, R.A. Battaglia, Burgess Publishing Co.
Minneapolis MN 55435

Merck Veterinary Manual, 1998

The Goat Keepers Veterinary Book, Peter Dunn, Farming Press

Raising Goats the Modern Way, Jerome D. Belanger, Storey Books

Goat Medicine, M. Smith & D. Sherman, Lea & Febiger

Angora Goats, The Northern Way, Susan Black, Diamond

Raising Meat Goats for Profit, Gail Bowman

Goat Production Guide, Meg Smart DVM PhD, Aspen Hills Enterprise

National Farm Building Handbook, Canadian Government Publishing Centre, Public Works and
Government Services Canada, Gatineau, Quebec K1A 0S9

National Farm Building Code, (NFBC)

Notes

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