

Section 4

FLOCK HEALTH

Why is it important to have a valid veterinary-client relationship?	33
What management practices should I employ to ensure a healthy flock?	33
How do I take a sheep's temperature?	34
What is the normal respiration rate for sheep?	35
What is the normal heart rate for sheep?	35
How can I reduce environmental stresses on animal health?	35
Can transportation impact sheep health?	36
How should I manage on-farm mortalities?	37
Why should I regularly vaccinate my sheep?	37
What are the most common vaccines used for sheep?	38
What are some of the common disorders that affect sheep?	39
How do I administer antibiotics to sheep?	41
How do I give a sheep an injection?	42
How do I insert a stomach tube?	45
References	46
Additional resources	46

The information in this chapter is a very basic introduction to disease prevention and sheep diseases. It is always best to consult with your veterinarian if you are uncertain about any aspects of the health management of your flock.

Why is it important to have a valid veterinary-client relationship?

- Establishing a valid veterinary-client relationship helps ensure that your veterinarian will be familiar with your flock and management practices in the event that a problem occurs.
- The Canadian Veterinary Medical Association indicates that a valid patient/client/practitioner relationship exists when:
 - The veterinarian has assumed the responsibility for making medical judgments regarding the health of the animals and the need for medical treatment, and the client (owner/caretaker) has agreed to follow the instructions of the veterinarian.
 - There is sufficient knowledge of the animal(s) by the veterinarian to initiate at least a general or preliminary diagnosis of the medical condition of the animal(s) by virtue of an examination of the animal(s) and/or by medically appropriate and timely visits to the premises where the animal(s) are kept.
 - The practising veterinarian is readily available for follow-up in case of adverse reactions or failure of the regimen of therapy.



Establishing a valid veterinary-client relationship helps ensure that your veterinarian will be familiar with your flock and management practices in the event that a problem occurs.

What management practices should I employ to ensure a healthy flock?

- Check your flock regularly. Pay close attention, so that you become familiar with the normal behaviour of sheep and have a better chance of identifying and quickly dealing with any problems that may arise.
- Health problems that are caught and dealt with quickly will affect fewer animals and decrease losses in profitability.
- Housed sheep should be inspected at least once per day; a suggested time is just after feeding.
- Sheep on pasture should be checked at regular intervals.
- Sick animals are generally less interested in eating and are likely to remain alone as other sheep move to the feeder. Lamé animals are also easily detected at this time.
- When the animals are at the feeder, check for indications of diarrhea – soiled fleece (i.e. tag) on the hindquarters.
- Check the pen floor and walls for anything unusual (e.g. blood, diarrhea) and make sure there is water available.
- Ewes and lambs should be checked frequently through lambing and lactation.



It is always best to consult with your veterinarian if you are uncertain about any aspects of the health management of your flock.

- In addition to visual health checks, monitoring body condition when you normally handle the animals (e.g. vaccinating, deworming, etc.) will help monitor the overall condition of the flock and pinpoint any sheep that are excessively thin. For the body condition scoring formula, see Appendix 1 of the Code of Practice: <http://nfacc.ca/pdf/english/Sheep1995.pdf>
- Each time you are in the barn or pasture, look for sheep that:
 - Are not eating or ruminating.
 - Remain separated from the flock.
 - Look 'depressed' – head down, droopy ears, dull eyes, hunched stance (back arched with forefeet and hindfeet placed close together under the animal).
 - Look hollow (abdomen/flank is excessively concave and hook bones are prominent).
 - Show signs of diarrhea (excessive tag or wetness on hindquarters are key signs, excessively watery or bloody diarrhea in the pen).
 - Show signs of bloat (distension of abdomen, particularly high on the left side where the rumen is located).
 - Show signs of respiratory distress (laboured breathing, nostrils distended, coughing, copious amounts of nasal discharge).
 - Show signs of neurological disorders (uncoordinated, moving in circles, abnormal gait or head carriage).
 - Show signs of lameness or stiffness.

How do I take a sheep's temperature?

- A sheep's temperature can be taken by gently inserting a thermometer into the sheep's rectum.
- Using a bit of mineral oil or other nontoxic lubricant will make the process easier.
- Be sure to hold the thermometer while you are taking the temperature to prevent it from becoming lost or broken.
- If you are using a glass thermometer it should remain in the animal for at least 60 to 90 seconds to ensure an accurate result.
- Digital thermometers signal when the temperature has stabilized (available at pharmacies).
- The normal body temperature of an adult is 100.9 to 103.8°F; lambs are normally higher than adults.
- A high body temperature indicates that the animal is stressed or the body is staging an immune response to an infection.
- A normal body temperature indicates that the problem is due to a non-infectious cause such as a metabolic disorder.
- A low body temperature in very young lambs indicates starvation and in adults may indicate internal bleeding.

What is the normal respiration rate for sheep?

- The normal respiration rate for sheep is 120 respirations per minute.
- An abnormally high rate is an indication of distress caused by diseases that attack the respiratory tract (such as pneumonia or MaediVisna) or could be a sign of severe pain due to injury.
- It is best to observe respiration rate before disturbing the animal as the stress of being caught will naturally increase the count.
- The easiest way to determine the respiration rate is to watch the animal's abdomen and count each complete breath (i.e. 1 breath = 1 inhalation + 1 exhalation).
- Respiration rate will be high in healthy animals that have been running, are stressed, or exposed to high ambient temperatures.



It is best to observe respiration rate before disturbing the animal, as the stress of being caught will naturally increase the count.

What is the normal heart rate for sheep?

- The normal heart rate for sheep is 70-80 beats per minute.
- Heart rate will increase under the same circumstances as the respiration rate.

How can I reduce environmental stresses on animal health?

- Many of the pathogens (e.g. viruses, bacteria and protozoa) that cause disease in sheep are present in their everyday environment.
- A normal, healthy sheep that is well-fed and given proper housing will generally be resistant to harmful infections by these pathogens.
- Undue stress, such as poor nutrition and unsanitary or poorly ventilated housing, will greatly reduce this natural resistance.
- Some management practices you can use to reduce stress are:
 - **Maintain a consistent routine.** Sheep, like most livestock, are creatures of habit and perform best when managed with a consistent daily routine.
 - **Have contingency plans** in place to deal with sudden changes in temperature, weather or feed supply. Sudden changes in feed or irregular lengths of time between feedings may disrupt the microbe balance in the rumen and cause potentially fatal metabolic upsets. Changes in feed should be made gradually to avoid digestive disorders such as bloat and acidosis.
 - **Maintain facilities to minimize stress and prevent injuries.** Proper facilities and housing practices are important for disease prevention. Animals that are overcrowded or not provided adequate shelter will have a greater susceptibility to illness.
 - **Handling facilities should be designed to minimize stress** on sheep and handlers, and should be maintained to minimize injuries to sheep.

- **Feeding facilities should minimize fecal contamination** by preventing sheep from walking on feed. Fence line feeders, feed racks and self feeders help control disease and parasite problems by keeping feed off of the ground, as well as reducing feed wastage. Bunks should be set up in a manner that allows for easy cleaning and feeding. Clean bunks as necessary.
- **Providing proper nutrition** will greatly increase the health of your sheep through increased disease resistance and prevention of nutritional and digestive upsets.
- **Lambing facilities should be a sheltered facility** to prevent neonatal losses.
- **Good ventilation** is essential to prevent a build-up of foul air, heat and moisture. Poor ventilation is a leading cause of pneumonia outbreaks.
- **Follow general housing practices.** Adult sheep need less protection from the cold than lambs, and often do well outdoors during the winter if provided with sufficient windbreaks and bedding. An insulated, well-ventilated barn or shed is preferable for intensive confinement rearing or lambing in winter.
- **Provide good drainage** from buildings and corrals to prevent the build-up of disease-causing organisms, which thrive in poorly drained soil.
- **Practicing proper manure management** in sheep housing areas helps prevent the build-up of disease-causing organisms and keeps sheep clean and dry.
- **Have adequate quarantine pens** for housing sick or new animals to prevent mixing with the rest of the flock.
- **Check water sources daily.** Water is an extremely important part of the diet. If using automatic waterers, check that the water is flowing and that the bowl is free of contaminants (e.g. hay, straw or feces).

Can transportation impact sheep health?

- Yes, you can reduce stress during transportation by:
 - Loading the truck or trailer appropriately. Sheep tend to push into a corner as a group when panicked, and it is not uncommon to have sheep (particularly lambs) become trapped and die if precautions are not taken during transport.
 - Ensuring there are an appropriate number of animals for the space will reduce the chance that lambs will lose their footing and be suffocated.
 - Using separation gates to divide large trailers and avoiding overcrowding will help reduce stress and trampling during transport.
- Thoroughly clean vehicles used to transport potential hazardous materials (e.g. farm chemicals, treated seed, etc.) before loading sheep.
- Provide sufficient bedding to improve footing and to keep animals clean.
- Clean and disinfect vehicles after transporting animals.
- Avoiding transporting animals in extreme temperatures.
- Do not transport 'downer' animals or those likely to go down during shipping. See guidelines on transporting sheep:
http://www.cansheep.ca/User/Docs/PDF/National_CSG_DecisionTree_2009.pdf



Biosecurity: Preventing the spread of disease

- 1) [*Farm biosecurity – a common sense guide.*](#)
- 2) [*Your livestock biosecurity checklist.*](#)

How should I manage on-farm mortalities?

- The proper disposal of livestock plays an important role in animal health management – especially in relation to minimizing the spread of parasites.
- Every livestock producer is responsible for disposing of all livestock mortalities in an environmentally safe and timely manner.
- Information on how to manage livestock mortalities varies by province:
 - **British Columbia** – The disposal of dead animals is specified in the Code of Practice, Part 8, Sections 23 and 24 of the Agricultural Practice for Waste Management. The disposal of animals on-farm is allowed if producers practice burial, incineration or composting. (www.agf.gov.bc.ca).
 - **Alberta** – The handling and disposal of dead animals is legislated under the Livestock Diseases Act Regulations which require that dead animals be properly handled, stored and/or disposed of within 48 hours. (www.agric.gov.ab.ca)
 - **Saskatchewan** – Regulations state that all dead animals must be disposed of in 48 hours with the five commonly acceptable methods of storage and disposal being rendering, burial, incineration, refrigeration and composting. (www.agr.gov.sk.ca)
 - **Manitoba** – The handling of dead stock in Manitoba is covered under the Livestock Manure and Mortalities Regulation under the Environment Act. All mortalities must be stored and kept either refrigerated or frozen if they cannot be disposed of in 48 hours. Acceptable disposal methods include: rendering, composting, burial or incineration. (www.gov.mb.ca)
 - **Ontario** – The disposal of dead stock is regulated through the Dead Animal Disposal Act, under which producers have three legal options for disposing of dead stock: rendering, burial or composting. (www.omaf.gov.on.ca)
 - **Quebec** – According to the Agricultural Products, Marine Products and Food Act there are only two options for non-renderable meat: rendering or incineration. A producer, however, may bury dead animals if the land is exclusively under his own production.
 - **New Brunswick** – Animal disposal procedures are specified by the Health Act. Carcasses must be disposed of within 24 hours by burial, incineration or any other method approved by a district medical health officer. (www.gov.nb.ca)
 - **Prince Edward Island** – Under the Environmental Protection Act, dead stock can be disposed of by rendering, composting or on-farm burial. (www.gov.pe.ca)
 - **Nova Scotia** – Please contact your provincial ministry for details on the handling of dead stock.
 - **Newfoundland** – Please contact your provincial ministry for details on the handling of dead stock.

Why should I regularly vaccinate my sheep?

- The purpose of giving a vaccine is to sensitize an animal's immune system to a specific bacteria or virus, without actually causing the disease.
- Manufactured vaccines mimic the effects of natural infection by exposing the immune system to controlled amounts of a disabled pathogen.



Vaccines that are not stored properly or are used after the expiration date may not provide the proper level of immunity.

- To maintain a high level of immunity, vaccines need to be given to sheep at regular intervals.
- If directly exposed to a disease-causing pathogen, even a vaccinated animal may show signs of the disease. However, the severity of the attack should be reduced, as the immune system will be able to respond quickly to the pathogen.
- Vaccines designed to mimic viruses may contain live viruses (modified to not cause disease) or killed viruses.
- Bacterial vaccines contain inactivated bacterial cultures (bacterin) or nontoxic derivations of bacterial toxins (toxoids).
- Antitoxins are available to reduce the effects of some bacterial diseases in unvaccinated animals (i.e. antitoxin for tetanus may be given if the animal receives a deep puncture wound, etc.).
- Before using vaccines, read the manufacturer's label carefully for information regarding administration and dosage recommendations for animals of different ages.
- Some vaccines are packaged in two parts; a dry component and a liquid component.
- The vaccine must be reconstituted (i.e. liquid portion mixed with dry) before administration.
- The product label will have instructions detailing the reconstitution and storage of the vaccine (e.g. refrigerate, expiry date).
- Vaccines that are not stored properly or are used after the expiration date may not provide the proper level of immunity.
- Consult with a veterinarian if the information on the label is not clear or if sheep are not included in the species listed on the label.
- Vaccines are most often administered by a subcutaneous injection.
- A lump will often form at the injection site as part of the normal reaction to the vaccine.

What are the most common vaccines used for sheep?

- **Clostridial (bacterin or toxoid) and caseous lymphadenitis**
 - There are a number of diseases caused by clostridial bacteria.
 - These bacteria are naturally present in the environment (soil) or in the digestive tract.
 - Clostridial vaccines are generally given in a combination vaccinations (3, 6, 7, or 8-way vaccine); 8-way combinations include tetanus toxoid; 3-way and 6-way shots may include caseous lymphadenitis.
 - Use: Ewes and lambs
- **Tetanus antitoxin (different from the vaccine)**
 - May be given if an animal has been wounded or is otherwise at risk.
 - Use: Ewes and lambs

- **Vibro**
 - Use only if vibrio is a problem in your flock (diagnosed by a pathology lab) or if you purchase ewes from flocks with unknown status (always best to ask for records and history).
 - Sheep and cattle vaccines are different.
 - Use: Ewes
- **Contagious ecthyma (orf or sore mouth)**
 - Live virus vaccine that can be contagious to people if not applied properly.
 - Vaccine comes with a 'scratch' applicator – a light scratch (deep enough for the vaccine to enter the blood system) is made to skin on a wool free area and vaccine is brushed on.
 - Vaccination does not provide 100% immunity if exposed to heavily-infected sheep or environment.
 - Use only in flocks with a history – the vaccine may cause the disease in clean flocks.
 - Check after a week – the vaccinated area should be appear raised and white, and the surrounding area reddish.
 - Resulting scabs are infectious, if vaccinating ewes ensure they are vaccinated well in advance of lambing (so that lambs do not come in contact with loosened scabs).
 - Use: Ewes and/or young lambs
- **Foot rot**
 - May be used in infected flocks in conjunction with other treatments.
 - Use: All animals
- **Rabies**
 - Use only on the advice of your veterinarian if there is a rabies outbreak in your area.
- **Lamb pneumonia (PI3)**
 - Nasal spray vaccine.
 - May help decrease the incidence of pneumonia.
 - If you have a high incidence of pneumonia in young lambs, it may be more effective to look for and revise problems with housing (ventilation, drafts, sanitation, etc.).
 - Use: Young lambs
- **If you are just starting your sheep operation, contact your veterinarian to help determine which vaccines are important for your area.**
- **Always follow your veterinarian's advice and/or label instructions for administration.**

What are some of the common disorders that affect sheep?

- **Health disorders include all diseases and conditions that compromise the productivity and well-being of your sheep.**

- The causes of disorders can be broken down into two basic categories:
 - Infectious (transferred either directly from an infected animal or through contact with an object contaminated by an infected animal).
 - Non-infectious (environmental causes).
- Many of the infectious agents are opportunistic and will flourish only when an animal is weakened due to another problem. The connection between good management and health cannot be stressed enough, as a little prevention can dramatically protect your sheep and your pocketbook from diseases.
 - Examples of **infectious disorders**:
 - Bacteria
 - Microorganisms that exist either independent (free living) or as parasites (dependent upon another organism for life).
 - Many dependent bacteria in the body are synergetic – they depend on the host, but contribute to the animals' well-being (e.g. rumen microbes).
 - Antibiotic resistance is a major concern for both animal and human health.
 - Improper use and overuse of antibiotics will greatly decrease the length of time that antibiotics will be effective.
 - Examples include clostridial diseases, foot rot, some types pneumonia and some abortion diseases.
 - Virus
 - Invade living cells and 'commandeer' the cell structures to replicate.
 - The cell is often destroyed as the virus replicates.
 - There is a high rate of mutation during replicating, which means that characteristics of virus populations can change rapidly, making the development of treatments difficult.
 - Antibiotics do not affect the progress of the diseases caused by viruses.
 - At times a secondary bacteria infection may develop in an animal that is weakened by a viral disease. Antibiotics will be useful in this circumstance.
 - Some viruses will eventually be cleared from the body by the animal's immune system – other viruses, once caught, will always be present.
 - Examples include foot and mouth, sore mouth, rabies and MaediVisna.
 - Parasites
 - See Parasites subsection for more information on internal and external parasites as well as dewormers.
http://www.cansheep.ca/User/Docs/PDF/T2-4_Parasites.pdf
 - Prion (Scrapie)
 - Prions are proteins normally found within the body's nervous tissue (i.e. nerves, spinal column and brain).
 - For unknown reasons, at times these prions will change to a form that resists the normal mechanisms for turnover and breakdown.
 - Prions continue to build-up on the nerve tissue eventually causing nervous disorders.
 - Examples of **non-infectious disorders**:



The connection between good management and health cannot be stressed enough, as a little prevention can dramatically protect your sheep and your pocketbook from diseases.

- Nutritional
 - See Nutrition section (5) for more information on sheep nutrition.
- Metabolic
 - Caused by an imbalance in the nutrients supplied in diet with production demands.
 - The animal's metabolism cannot meet the production demands and nutrients are extracted from the animal's system at a greater rate than they can be replenished.
 - Typically rapid onset of signs.
 - Occurs at times of sudden increases in production requirements (e.g. when a ewe begins lactating) or with sudden changes in diet (e.g hay diet directly to lush pasture).
 - Examples include pregnancy toxemia, hypocalcaemia and grass staggers.
- Digestive
 - Also linked with nutrition and changes in diet.
 - Generally caused by a disruption in rumen function.
 - An example is bloat.
- Genetic
 - Defects that are inherited from parents.
 - Intensive linebreeding or inbreeding programs generally cause an increase in these disorders.
 - Keeping good breeding and lambing records will greatly aid in culling the problem out of your flock.
 - Examples include entropion and overshot jaw.

How do I administer antibiotics to sheep?

- Prevent problems. Do not rely on antibiotics to replace good management. Provide sheep with a dry, clean environment, ample feed and have a biosecurity plan in place.
- Using antibiotics responsibly helps maintain the effectiveness of drugs and helps producers save on medication costs.
- Some basic rules when using antibiotics are:
 - As a producer, know what diseases are prevalent at particular production stages or seasons.
 - Consult your veterinarian if you are uncertain about the diagnosis.
 - Recognize the limitations of antibiotics.
 - Remember that some bacteria are only sensitive to certain antibiotics, and that antibiotics are not effective against diseases caused by viruses.
 - An antibiotic will not remove scar tissue from lungs, and there is no advantage in treating some animals with persistent respiratory problems.
 - Take the sheep's temperature. If the temperature is normal, the cause of the disorder is not likely to be due to an infection and antibiotics will generally not be effective.



Prevent problems. Do not rely on antibiotics to replace good management. Provide sheep with a dry, clean environment, ample feed and have a biosecurity plan in place.

- Monitor animals regularly and treat early.
- Infections are more difficult to treat once they are well established.
- Follow label or veterinarian instructions regarding dosage and length of treatment.
- Do not cut the treatment time short even if the animal appears to have recovered. Although it may seem that you will save a dose or two of antibiotic by decreasing the treatment time, in the long run you could be creating even larger problems.
- Identify animals that have been treated.
- Ensure everyone who works on the farm understands the identification system and is recording each time medication is administered.
- Maintain records regarding which medication has been effective in the past.
- Take care of drugs and store according to label recommendations (e.g. refrigerate, store out of direct light, etc.).
- Watch expiry dates and do not use outdated drugs. Medications that are old or not stored correctly may be less effective at eliminating all of the bacteria (possibly leading to resistance), and in some cases, may become toxic to the animal you are treating.
- Antibiotic residue in meat and milk is a major food safety concern.
- Maintain records regarding the withdrawal dates of all medications administered to animals.
- Double-check your records before shipping animals for slaughter.



**Monitor animals
regularly and treat early.**

How do I give a sheep an injection?

- Injection is the only method of administration for many medicines and vaccines.
- Each injection has the potential to do harm, besides pain or suffering.
- The injection could also create residues, scar tissue or abscesses.
- Follow these principles of giving vaccines and injectable treatments to avoid problems at injection sites and to maximize the benefits of your treatments:
 - Read the label and look for the following information:
 - The product name, the active ingredient and the concentration appear on the label.
 - The description of its use describes a product and its purpose.
 - The instructions for preparation describe how to prepare a product for injection.
 - The formulation describes the contents of the package and tells you if the product is suitable for injection.
 - Warning statements show hazards to human health from handling the product, the withdrawal time, and restrictions on use.
 - The withdrawal time is the minimum time between the last treatment and the slaughter of the animal for food (or sale of the milk). This is the time needed to allow for residues to deplete to safe levels.
 - Product usage information appears on the side panels of a label.
 - The precautions statements alert you to storage and safe handling practices

to maintain stability and potency.

- The indications statements show the species, class of livestock, and the disease conditions for the product.
- Dosage and administration statements show the directions for use (e.g. how much, how often, how long), the route of administration – intramuscular (IM), subcutaneous (SQ) or intravenous (IV) – and the timing of treatment.
- Cautions and contraindications statements warn about hazards to animal health and safety (e.g. known adverse reactions).
- Restricted uses will appear on the labels of some products (e.g. do not use in sheep).
- Read package insert for complete directions, additional precautions or more complete instructions.
- The expiry date is the date past which the product should not be used. It is valid only if the product has been properly stored.
- The lot number describes the manufacturer's batch during production. It is used to trace the drug if necessary.
- Bottles and bottle tops:
 - Clean bottle tops with alcohol and cotton.
 - Place one sterile needle in the bottle top to fill the syringe and use a separate needle for injection.
 - Remove needles from all bottles prior to storage.
 - Write the date the bottle was opened on the label.
- Injection site:
 - Choose SQ when given a choice of IM or SQ on the product label.
 - Choose muscle tissue of lesser value to consumers (e.g. neck) for IM injections.
 - Give SQ injections in the neck in front of the shoulder or over the ribs behind the shoulder.
 - Inject through an area of clean, dry skin.
- Clean equipment:
 - Wash your hands before and after handling products.
 - Use sterile disposable needles and syringes.
 - If not using disposable equipment, clean and sterilize all equipment before and after use.
 - Use only hot water to rinse syringes before using modified live virus vaccines. Chemicals may destroy the live virus.
 - Use hot water and mild disinfectants to clean syringes for other injectable products.
- Needles:
 - Use a new, sterile, disposable needle for each animal.
 - If using the same needle for multiple injections, change the needle frequently (e.g. 10 animals) to ensure it is not bent or burred (i.e. slightly

bent at the point).

- Choose the smallest needle size for the product to minimize tissue damage and reduce leakage at the injection site. Use 16 or 18-gauge needles for most injectable products (20-gauge needles for lambs).
- Choose the correct length needle, 1 inch for IM and 0.5 inch or less for SQ injections.
- Restraint:
 - Restrain the animal to prevent injury to yourself or the animal, and to prevent needles from breaking off in tissue.
- Volume of injectable product:
 - Inject quantities no greater than recommended on the label (for one dose).
 - Split large volumes into smaller amounts and inject in different locations (e.g. opposite side of the neck).
 - For IM injections, inject no more than 10 mL per site. For SQ injections, inject only 20 mL per site.
- Needle and syringe techniques:
 - Eject air from the syringe before injecting the product.
 - After inserting the needle, check that it is not in a blood vessel when injecting IM or SQ.
 - Pull back on the plunger and observe for blood. If blood appears, remove the needle and put it in a slightly different location.
 - Give SQ injections into a tent of skin. Lift a fold of skin and insert the needle through the skin into the tented space. The needle enters the skin at an angle of 30 to 45 degrees to the body. Use a 0.5 to 1-inch long needle.
 - Give IM injections deep into a muscle. Your needle must be long enough to penetrate skin, subcutaneous tissue and fat to reach the muscle. The needle enters at a 90 degree angle to the body. A 1-inch needle will suffice.
 - For IV injections, get advice and training from your veterinarian.
- Mixing products:
 - Do not combine vaccines or products unless the label clearly states to do so. Mixing inactivates products through changes in pH, alterations to chemical composition, or precipitation out of solution.
 - Gently shake or agitate products to ensure they stay in proper suspension in the bottle. Some products settle out and you need to invert and gently shake the bottles before and during use.
- Adverse reactions:
 - Injecting medicines into sites other than the one recommended on the product label can lead to adverse reactions. Examples include:
 - Delayed absorption of the drug, achieving lower than therapeutic levels, and less effective treatment.
 - Delayed absorption of the drug and extended withdrawal times due to residues from pooling of the product in tissue.
 - Moderate to severe tissue reaction with pain, swelling, interruption of blood supply and delayed absorption of the product, or formation of scar tissue and excessive trim at slaughter.
 - Allergic reactions, shock or death.



Do not combine vaccines or products unless the label clearly states to do so. Mixing inactivates products through changes in pH, alterations to chemical composition, or precipitation out of solution.

How do I insert a stomach tube?

- **Lambs:**
 - Specially designed tubes are commercially available or any new, flexible (3/8" diameter) tubing can be used with a 60 cc plastic syringe to deliver the milk.
 - Lay the tube alongside the lamb and measure from the last rib to the mouth.
 - Make a mark on the tube at this point with a piece of tape or a marker pen, and allow an extra foot of tubing past this point.
 - Hold the lamb on your lap and ensure that the lamb's head is upright (don't tube while the lamb is laying flat on its side).
 - Put your thumb in the mouth, between the teeth, and gently pry the mouth open.
 - Insert the tube through the side of the mouth and feed it slowly into the mouth as the lamb swallows.
 - Keep a finger in the mouth while the tube goes down to prevent the lamb from chewing it.
 - Keep passing the tube until the mark on the tube is level with the mouth.
 - There may be a small amount of resistance as the tube passes into the throat, however, if the lamb struggles violently or if you can only pass the tube half way to your mark, the tube may have accidentally entered the trachea (windpipe). Pull the tube out and try again.
- **Adults:**
 - Hold sheep as with drenching.
 - Insert a speculum (stiff metal tube) into the throat (don't force it too far); speculum prevents the sheep from chewing on the hose.
 - As when stomach tubing lambs, do not force the tube if there is undue resistance.
 - Pass a pliable rubber hose (3/4" in diameter and three to five feet long) through the speculum into the rumen (as with tubing lambs, mark the approximate distance on the hose).
 - Administer medication directly into the rumen treating for bloat or other digestive upsets.



Administer medication directly into the rumen treating for bloat or other digestive upsets.

References

Flock Health Guide for BC Sheep Producers

British Columbia Ministry of Agriculture, Food and Fisheries

http://www.agf.gov.bc.ca/sheep/publications/documents/sheep_flock_health_guide.pdf

Sheep and Goat Management in Alberta; Nutrition Chapter

Alberta Lamb Producers and Alberta Goat Breeders Association, 2009

http://www.ablamb.ca/producer_mgmt/sheep_goat_mgmt.html

Sheep Flock Health

Mamoon Rashid, Manitoba Agriculture, Food and Rural Initiatives

<http://www.gov.mb.ca/agriculture/livestock/sheep/bsa01s08.html>

Introduction to Sheep Production Manual

Ontario Sheep Marketing Agency

<http://www.ontariosheep.org/Intro%20to%20Sheep%20Production/6.%20Reproduction%20and%20Lambing.pdf>

Additional resources

Parasites

Information on internal and external parasites as well as dewormers, etc.

http://www.cansheep.ca/User/Docs/PDF/T2-4_Parasites.pdf