8. Skin Diseases

Most text books subdivide skin problems by cause (for example, viral, fungal and parasitic). However, this is not very helpful in making a diagnosis. Instead we shall approach them by major presenting sign:

- Itchiness
- Crusting
- Oozing
- Hair loss

Itchiness

Spotting an itchy sheep or goat is not difficult. They will rub on anything, which often causes severe damage to their fleece and underlying skin. In severe cases they are so itchy they stop eating; they can also lose a lot of weight. Severe itchiness (often called **pruritis**) is an animal welfare issue. It must be addressed as soon as possible.

__Pruritis__ is the medical term for itching. __Pruritus__ is an uncomfortable skin sensation that results in itching or rubbing.

Scrapie

Scrapie is a degenerative neurological disease that can cause some animals to experience extreme itchiness. Scrapie is both a federal and provincial reportable disease in Alberta. Federal jurisdiction comes under the Canadian Food Inspection Agency (CFIA). The disease is described in detail in the neurological diseases section. (Refer to *Chapter 10, Scrapie*.)

Psoroptic Mange (Scab)

Cause

The cause of scab is the skin mite—*Psoroptes ovis* in sheep and *Psoroptes caprae* in goats. This microscopic mite burrows into the surface of the skin and feeds on skin material and secretions. The mite is highly contagious and can quickly spread between animals. Mites may persist in the environment for up to two weeks. This disease is a serious problem in most parts of the world. In Canada, it is a reportable disease although it has largely been eradicated.

Clinical Signs

The presence of the mite causes extreme irritation. Sheep and goats will rub themselves on anything and nibble at their fleece. The fleece initially looks unkempt and dirty before significant wool is lost. Careful examination of sheep and goats may reveal wool caught in the teeth. Close examination of the affected areas (typically along the back) will show yellow crusting at the base of the wool caused by serum oozing out through damaged skin. If the affected areas are rubbed, sheep/goats often raise their head or make nibbling motions and appear to enjoy it. This is known as the *nibble reflex*. As the disease progresses, animals lose weight and may develop secondary skin infections.

ELDU
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Diagnosis

Veterinarians can scrape the skin at the edge of the lesion with a scalpel blade and examine the material under a microscope to find the mites.

Treatment

The *Psoroptes* mite is very sensitive to ivermectin injection. Sheep/goats should be treated twice, at two-week intervals; they should also be monitored. **Note**: Ivermectin is not licensed in goats.

Prevention and Control

All new animals introduced to the flock/herd should be quarantined for at least 30 days. Any affected individuals should receive prompt treatment and be isolated until the parasite is removed.

Foot Scab

Cause

This is caused by the mite *Chorioptes ovis* (sheep) and *Chrioptes caprae* (goats). The mite mainly affects the lower limbs, scrotum, the brisket, and the area around the eyes. It can be differentiated from *Psoroptes* mites by examination under a microscope.

Clinical Signs

Itchiness and crusting in the typical areas described above.

Diagnosis and Treatment

As for scab.

Prevention and Control

Introduction into flock/herd can be controlled with biosecurity measures.

Lice

Cause

This is caused by infestations of the sheep louse *Damalinia ovis* and the goat louse *Damalinia caprae*. These biting lice live within the wool/hair and eat skin debris. Their presence causes severe itchiness. There are also sucking lice that affect both sheep and goats but they are less common. Lice cannot live for long off the animals; the disease is spread mainly by direct transmission.

Diagnosis

Identification of lice in the fleece/hair under the microscope.

Treatment

Common biting lice do not suck body fluids like mites; therefore, treatment with systemic parasiticides like ivermectin is ineffective. Sheep must be treated with a parasitical treatment applied to the skin. If sucking lice are identified, ivermectin products can be used.

Prevention and Control

Lice do not survive very long away from sheep and goats. They are normally introduced by carrier animals. The disease can be avoided by being cautious when sourcing replacements and limiting contact with other sheep and goats at shows or community pastures.

Sheep Keds

Cause

This is caused by the parasite *Melophagus ovinus*. These are small oval parasites that look very much like ticks, but they are actually classified as wingless flies. They walk around in the fleece, taking intermittent blood meals. Close examination will also show that unlike ticks they have three pairs of legs, not four.

Clinical Signs

Although keds do cause some irritation and hide damage, they are most commonly seen simply crawling through the fleece. As mentioned, they are often mistaken for ticks. Affected individuals may be itchy.

Diagnosis

Seeing keds crawling through the fleece.

Treatment

Systemic treatment with ivermectin should be effective as keds are blood suckers. Treatment must be strategic to be effective. Treatment with the effective product **must be** done at shearing time because the keds will be forced to take a blood meal soon after shearing; they will not be able to hide in the fleece. Ectiban is approved for use in sheep for this parasite.

Prevention and Control

Keds do not live off the host; infection occurs after close contact between individuals. When purchasing replacements and herd sires, ask the sellers if they have keds in their flock. If so, treat the individual before putting it into your flock.

Crusting and Oozing Skin Conditions

Orf

Refer to *Chapter 5, Acquired Health Disorders in Newborns*.

Mycotic Dermatitis (Lumpy Wool Disease, Fleece Rot)

Cause

This disease is caused by *Dermatophilus congolensis* bacteria. These bacteria are able to become established in the skin when the fleece is continuously saturated with water.

Clinical Signs

The disease is typically seen where the sheep's fleece is the wettest, usually along its back, neck and head. There is a thick crusting at the base of the fleece; often lumps of wool can be pulled out, revealing a red, raw area.

Diagnosis

Laboratory culture of the organism.

The disease is rare on the prairies, due to our relatively dry climate. Persistent wet weather is required to promote this problem.

Treatment

In mild cases the disease is self limiting. In severe cases the fleece must be clipped; the clipped area should be cleaned with a disinfectant, such as Hibitane soap. Animals should also be treated with penicillin for three to five days.

Prevention and Control

There are no preventative measures as mycotic dermatitis is a consequence of environmental conditions.

Ringworm

Cause

This is caused by the fungus *Trichophyton verrucosum*, derived from cattle. The fungus is left on inanimate objects, such as fence posts, when an affected cow rubs on the area. A sheep or goat may develop the disease by rubbing on the infected post. The fungus can survive in the environment for many months. The disease in sheep is typically much less severe than in cattle; sheep will recover without treatment. Goats may be affected more seriously.

Clinical Signs

You will see scabby, crusty white lesions, typically around the face or any area of the body covered by hair. Ringworm lesions rarely occur under the area covered by wool. The disease can look similar to orf but is not so severe.

Diagnosis

The fungus can be grown in the laboratory from a hair sample.

Treatment

The disease is usually self limiting; treatment is often not necessary. However, topical iodine on the lesions is sometimes used; antifungal drugs are also available if you wish to treat the condition.

Prevention and Control

Avoid contact between your flock and any other affected livestock. Do not share halters, brushes, or cards between flocks.

Zoonosis Alert: Ringworm can also affect humans.

Zoonosis *– a disease of animals that may secondarily be transmitted to man.*

Blowfly Strike

Cause

Blowflies lay eggs on animals anywhere they are wet. Maggots hatch from the eggs to invade the tissues close to the affected areas. Blowflies are attracted to areas where there is damaged tissue. Such areas include:

- The areas around the anus in sheep/goats with severe diarrhea.
- Wounds in the skin, common causes include shearing wounds and dog bites.
- The prepuces of rams/bucks, if it becomes saturated with urine.
- Head wounds in rams/bucks, due to fighting.
- Around the feet in animals with foot injuries, especially foot rot.
- The backs of sheep with full, wet fleeces that are developing mycotic dermatitis.

The maggots secrete enzymes that enable the maggot to feed on the surrounding tissues. As more tissues become affected, more blow flies are attracted to the area; they lay more eggs and the situation worsens.

Clinical Signs

An important skill is identification of a "struck" sheep/goat. The animals are typically irritated at the lesion; they will rub the area, nibble at the area, lip smack and wag their tails. An affected animal will separate from the flock/herd and stop feeding. The fleece over the affected area may become discoloured. As the condition progresses, bacteria grow in the rotting tissue releasing toxins which are absorbed into the blood, leading to septicemia and toxemia (blood poisoning).

Diagnosis

Simply part the animal's fleece/hair. The smell of the rotting tissue and the presence of maggots are unmistakable.

Treatment

The fleece over the affected area must be fully clipped. The area should then be washed with a mild veterinary disinfectant such as Hibitane or Betadine. Use a pair of tweezers to remove all obvious maggots. You then need to assess the severity of the problem. In mild cases where the infestation is superficial and the sheep/goat is in good health, this may be all that is required. In more severe cases, when the maggots have migrated into the deeper tissues, contact a veterinarian. In very severe cases it is often best to euthanize af-

fected animals. However, do not be quick to euthanize the affected animal until the area has been completely cleaned and the severity assessed; it often looks worse than it actually is.

Specific Treatments

For problematic infestation animals can be treated with a dose of injectable ivermectin; this will help to kill maggots in the tissues. Severely affected animals should be treated with a broad spectrum antibiotic and given supportive care. This support can include providing fluids with a stomach tube or injecting anti-inflammatory drugs, in accordance with your veterinarian's recommendations. Once the area is dry and clean the flies will no longer be attracted to it; this is critical to case management.

Prevention and Control

It is important to follow the following steps to prevent fly strike on the prairies:

1. Reduce the number of flies. Carcasses, afterbirths, and other waste tissues act as breeding grounds for flies. Remove and burn these to reduce the attraction of flies. Keep corrals as clean as possible and keep manure piles to a minimum.
2. Ensure that flies are not attracted to sheep or goats by:
   - Docking tails appropriately (sheep only)
   - Preventing diarrhea or treating it quickly if cases do occur
   - Cleaning and treating wounds quickly
   - Shearing animals before fly season

Realize that animals that are down for any reason are at increased risk to fly exposure.

Bacterial Dermatitis

Cause

Any injury to the skin can allow bacteria to penetrate, setting up an infection. This may commonly occur after an animal has been scratching itself, or after an injury.

Clinical Signs

The skin is inflamed and reddened. There may be oozing and thickening of the skin.

Diagnosis

You may want to collect and submit a sample to the laboratory for culturing.

Treatment

Mild cases may only require cleaning of the area. It is usually necessary to clip the hair/fleece around the affected area and clean with a mild disinfectant. More severe cases may require treatment with antibiotics.

Prevention and Control

Identify affected animals and treat promptly.

Hair Loss

Most hair loss in sheep and goats is due to itchy animals scratching themselves. Occasionally, animals in close confinement will lose hair from areas that are continually rubbed, for example, the neck area on feeders.

Wool Slip

Cause

It is suspected that when some sheep become very sick wool growth is adversely affected. Wool grows continuously. When an animal is sick, a weak point develops in each fibre of the fleece at the same level deep in the skin. Several weeks later the wool starts to break off. As the fleece grows out the "weak area" reaches the surface and the break-off section develops. As this occurs across the whole body the fleece starts to fall off.

Clinical Signs

Fibre loss with no other signs. There may be a history of illness in the last month.

Diagnosis

This is based on history and examination.

Treatment and Prevention

Recognize that this can happen anytime that an individual is severely ill. Remember to include it on your differential list when presented with a case. Wool Slip is an individual animal problem and should never be considered as the possible disorder when a number of animals in a flock are experiencing fibre loss.

Skin Lumps

Caseous Lymphadenitis

Cause

Corynebacterium pseudotuberculosis bacteria cause this condition. In sheep/goats the bacteria are spread by externally discharging abscesses or by sheep/goats with lung lesions. Shearing is considered a high risk event only because the chance of lancing an abscess open with the shears is high. The shears become contaminated when an abscess is inadvertently cut and the bacteria are then spread to other sheep via nicks in the skin. Confinement under cover is a significant risk factor because those individuals with lung lesions can more easily transmit the disease. Research has shown that confining animals under cover together for greater than one hour after shearing increases the risk of infection by three times, compared with non-confined animals. In goats, the abscesses tend to burst as animals rub them on fence posts and buildings. Other animals rubbing in the same area then become infected. In some cases, the bacteria may enter the bloodstream and spread to internal organs (Refer to *Chapter 13, Caseous Lymphadenitis*.)

Clinical Signs

Lumps will appear on the body. Anywhere there is a lymph node a "caseous" lump may form.

Diagnosis

Not all abscesses are caused by *C. pseudotuberculosis*. To make sure of the cause, your veterinarian can do cultures.

Treatment

Abscesses should never be opened as this simply contaminates the environment and encourages spread of disease. Antibiotics do not work to treat these abscesses. The abscesses on individual animals can be surgically removed by your veterinarian. Affected animals should be culled as soon as possible, especially if they have multiple abscesses. Injection of formalin into such abscesses has been reported. This should **never** be done; formalin is known to cause cancer. Sheep and goats are classified as food producing animals; formalin contaminated animals should **not** be entering the human food system.

ELDU
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Prevention

Do not buy animals with lumps. Cull affected animals. Ensure affected animals are sheared last. Vaccination is an effective way to reduce the number of abscesses in the flock. (Use either Case-Bac or Caseous D-T). This is a very common disease in sheep and goat flocks. Initial vaccination protocols will be more effective if individuals are at least 14 weeks of age when the vaccination series is started. Use of the above vaccines in a goat flock constitutes an ELDU which requires a veterinary prescription.

Abscesses

Cause

The most common cause of abscesses is caseous lymphadenitis. (Refer to *Chapter 8, Caseous Lymphadenitis*.) However, abscesses can be formed for other reasons. There are a number of types of bacteria that may cause an abscess to form following a penetrating wound.

Clinical Signs

Swelling, often slightly soft and also warm.

Diagnosis

As for caseous lymphadenitis; a needle can be used to collect a sample of the pus.

Treatment

Treatment is complicated by the fact that caseous lymphadenitis is a common cause of abscesses. Because these CL abscesses should never be opened, a diagnosis should always be made before treatment is attempted. The softest portion of the abscess should be identified and the area clipped and cleaned with disinfectant. A cut should be made with a scalpel and the pus drained and collected for disposal. The abscess should then be flushed clean daily with mild disinfectant until it is healed. This may take several weeks.

9. Lameness

Lameness in sheep and goats is a very important condition in small ruminant flocks, for a number of reasons:

- Some diseases such as foot-rot are highly contagious and can quickly spread throughout the flock/herd.
- Lame animals are suffering, making lameness an animal welfare issue.
- Lame animals cannot move around to find food and water, so they quickly lose condition and become more susceptible to predation.
- During the breeding season, lameness can severely affect fertility in both the males and females.

Foot Rot

Cause

Classical foot rot is caused by *Dichelobacter nodosus* bacteria in conjunction with *Fusobacterium necrophorum* bacteria. *Fusobacterium necrophorum* is found in the soil and feces wherever livestock are found. It cannot be eliminated. *Dichelobacter nodosus* is a bacterium specific for the sheep/goat foot and is an absolute requirement for true foot rot. The bacterium cannot survive away from sheep/goat for more than 10 days. It can therefore (and should) be eradicated.

Clinical Signs

Severe lameness. An animal may obviously favour one leg, or it may tend to crouch on its knees, unable to stand. The animals often separate from the flock/herd and may lose much weight.

Diagnosis

Diagnosis depends on examination. The feet should be cleaned with a stiff brush or water to aid visualization. In the **earliest stages** of the disease the skin between the claws becomes inflamed and reddened. This is known as "scald". (Refer to *Chapter 9, Scald.*) A **secondary infection** with *Dichelobacter nodosus* will allow the bacteria to penetrate and eat away the soft horn under the bulb of the heel causing the horn to separate. In **severe cases** there is extensive under-running of the hoof wall and toe. The area under the under-run horn is full of foul smelling, grey, cheesy material. If the disease is untreated the horn will eventually start to grow back, but this process is disorganized, resulting in deformities of the hoof.

If confirmation is required, your veterinarian can take samples from the affected feet and submit them to the laboratory for bacterial culture.

Treatment

Foot rot is such an important and problematic disease in sheep that individual treatment is a complete waste of time. The disease must be eradicated in the flock to avoid the costs of treatment (time and money) and the welfare implications.

Eradication

Bring the whole flock (including rams) into a holding area. The feet of all animals should be examined and the flock divided into three groups:

Group 1—apparently unaffected animals
Group 2—lame animals
Group 3—animals with severe infection and/or misshapen feet

Animals in Group 1 should have their feet trimmed (disinfect trimmers between animals) and be foot bathed in 20 percent zinc sulphate solution.

Animals in Group 2 should be treated as above but when the feet are trimmed, all digits or cracks must be fully trimmed out. These animals can also be treated with a long acting oxytetracycline antibiotic (extra label use or "ELDU").

Animals in Group 3 should be culled.

It is vital that sheep are managed in a complete "one way system." After the foot bath animals must be moved to a pasture that

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has been free of sheep for at least two weeks. They must also be moved by a route that has been free of sheep for two weeks.

Foot Bath Preparation

Ideally, the foot bath should be of a size to hold as many animals as can have their feet trimmed in one hour. The depth of solution should be eight centimetres (three inches) to ensure that the entire foot is covered. The foot bath solution is prepared from two kilograms of zinc sulphate monohydrate powder dissolved in 10 litres or two pounds in one Imperial gallon of water. You must add a wetting agent to ensure the solution penetrates the foot (175 mL laundry detergent per 100 litres of water or one cup per 30 gallons). Zinc sulphate is usually available from agricultural merchants or your veterinarian.

Math Made Easy

Once it is determined how big the footbath needs to be to hold the desired number of sheep, measure the inside of your footbath in centimetres or inches.

Metric Measure **Litres of zinc sulphate required**
1. Width (cm) X Length (cm) X Depth of 8 cm
2. Divide the answer by 1000 = number of litres
Kilograms of zinc sulphate required
3. Number of litres (from 2) X 0.2 = number of kg of zinc sulphate required
Millilitres of laundry detergent required
4.Number of litres (from 2) x 1.75 = number of mL of laundry detergent
Imperial Measure **Gallons of zinc sulphate solution required**
1. Width (inches) X Length (inches) X Depth of 3 inches
2. Divide the answer by 280 = number of gallons
Pounds of zinc sulphate required
3. Number of gallons (from 2) X 2 = number of pounds of zinc sulphate required
Cups of laundry detergent required
4. Number of gallons (from 2) ÷30 = number of cups of laundry detergent

Herd animals into the foot bath and keep them standing in it for one hour. **Do not** let the animals drink the solution; it is toxic.

The solution becomes less effective with use. The quality of the solution can be measured with a battery tester (not an anti-freeze tester). If the zinc sulphate concentration falls below 15 percent it will not be effective at all.

Because zinc is toxic, disposal of the solution must be done carefully so that it does not become an environmental hazard.

Prevention

This disease can be considered animal dependent because *D. nodosus* can only survive a short time in the environment away from animals.

If the disease gets into your flock, it is because it was either brought in by a replacement animal or your animals have been in contact with infected animals. Remember that the organism can live in the environment for 10 days, making any area where animals are either mixed or share walkways high risk for spreading this disease.

Preventing foot rot involves buying replacement animals only from flocks with a known history. Even then, all replacements should be quarantined. During the quarantine process the animals' feet should be trimmed and they should have the foot bath treatment.

If your animals are to mix with others in a community pasture, or at a livestock show or other event, ensure that there are protocols in place to aid in the control of foot rot.

Vaccines have been developed in other parts of the world and appear to be effective. A vaccine is available in Canada, but first an EDR must be completed, through your veterinarian.

EDR
Emergency Drug Release permits the manufacturer of a new drug to sell a limited quantity of the new drug to a veterinary practitioner. The new drug is one which is not marketed in Canada and is requested by the practitioner for the purpose of diagnosing or treating a medical emergency.

Scald

Cause

This disease is caused by the bacterium *Fusobacterium necrophorum*. These bacteria are naturally present in the soil and feces wherever livestock are kept. In situations where the ground is very wet the surface of the skin between the two claws becomes soft and is easily invaded by the bacteria, causing inflammation.

Clinical Signs

Mild lameness. Examination of the hoof will reveal reddening of the skin between the claws.

Diagnosis

Clinical signs only.

Treatment

Most cases will resolve without treatment if the animals are moved to a dry area.

Foot Abscesses

Cause

The junction of the hoof wall and sole of the foot, often referred to as the white line, is the weakest part of the foot. It is possible for debris to erode this part of the hoof, allowing bacteria to enter the deeper tissues. Should the bacteria reach the deeper tissues of the foot an abscess may form. Abscesses occur most commonly in the toe region and are also more common after episodes of laminitis. (Refer to *Laminitis* - next topic in this chapter.)

Clinical Signs

It is common to see severe lameness in one limb. The affected claw will be hot and painful if squeezed. Typically, black debris is embedded in the white line.

Treatment

Trim down the discoloured white line with hoof shears and a knife until you reach the abscess. Allow the area to drain and remove all under run horn; do not leave pockets to be filled with dirt. In most cases no further treatment is necessary.

Laminitis (Founder)

Cause

When animals are fed concentrated diets high in carbohydrates (sugars) the increased lactic acid produced by the rumen causes inflammation of the deep tissues of the hoof. This causes inflammation and pain. Laminitis may also occur after severe systemic illness as a response to stress.

Clinical Signs

Lameness in more than one foot. Feet are often warm and painful if pressed with pliers.

Treatment

Reduce the amount of carbohydrate that the animal is consuming and offer supportive care, because affected individuals often have difficulty moving around. Consult with your veterinarian about using an anti-inflammatory drug to make the animal more comfortable.

Prevention

This is a management disease. Careful review with a nutritional consultant of how your rations are formulated will go a long way towards

preventing this disease. Avoid high concentrated diets with too much grain and restricted amounts of roughage.

Ovine Digital Dermatitis (ODD, Hairy Heel Wart)

Cause

ODD has recently been discovered in sheep in the UK. The disease appears to be related to hairy heel wart in cattle. It is caused by a *Spirochete* bacterium.

Clinical Signs

The animal has severe lameness affecting one limb. There is typically an ulcerated lesion on the skin on the bottom of the hoof, with severe under running of the hoof wall.

Treatment

In cases which have been caught early enough, using a foot bath with oxytetracycline antibiotics applied to the lesions works well. In severe cases it may be necessary to amputate the affected digit.

Prevention

To date there has been no diagnosis of this disease in North American sheep.

Foot Trimming

Foot trimming is an important skill that anyone working with sheep or goats should be and can be proficient at. Anyone trimming a foot should have a plan in mind; it is unacceptable to simply hack at the foot until it bleeds.

Tools

Feet can be trimmed using a hoof knife, hoof trimmer pliers or a combination of both, depending on the operator's preference. A hoof rasp is also useful for finishing the hoof.

Restraint

Sheep are typically set up on their butts and held between the knees for foot trimming. Goats typically stand. Several types of cradles and devices are also available to hold animals while their feet are trimmed.

Trimming Principles

The hoof of a sheep or goat grows continually (like a finger nail). The sole and the wall grow at the same rate. However, the wall is much

tougher than that of the sole so the sole tends to wear away more rapidly. The amount of wear of the walls depends on the environment, the type of ground, the amount of walking and the breed. The two goals of foot trimming are:

1. To restore the natural balance of the foot
2. To deal with any problems

Make the first cut straight across the toe. If you are unsure about how much horn to trim, start by trimming small pieces; you can always take off more later. In most cases, the outer wall of the hoof grows around and under, covering the sole.

This whole area should be removed until it is level with the sole and all the packed debris is cleaned out. The wall on the inner surface of the hoof rarely overgrows excessively, but should be trimmed level with the outer wall. Trim the heel area only if it is very overgrown. Finally, any areas of under run horn or pockets of embedded debris should be explored and cleaned. You can use a rasp to smooth any sharp edges after trimming.

Upper Limb Lameness

Arthritis

Cause

As the sheep ages, arthritis develops, mainly by the natural degeneration of the joints. This is termed "osteoarthritis."

In goats, most arthritis is due to infection with CAE. (Refer to *CAE* - next topic in this chapter.)

Clinical Signs

Animals are lame. There will be no signs in the foot to explain the lameness. Close examination of the legs may reveal swollen joints and/or joints that are apparently painful when manipulated. The animal may exhibit an abnormal gait.

Treatment

Most of these animals should be culled because there is no treatment. Individual animals may be made comfortable using anti-inflammatory drugs, with veterinary advice.

Prevention

Osteoarthritis cannot be prevented; it is part of the aging process. For information on CAE prevention, refer to *CAE* below.

Caprine Arthritis Encephalitis (CAE)

Cause

Caprine arthritis encephalitis (CAE) is caused in goats by the CAE virus, a virus very closely related to maedi-visna in sheep. (Refer to *Chapter 12, Maedi-Visna*.) The two diseases are very similar; while maedi-visna in sheep tends to affect the lungs and brain, CAE most commonly affects the joints and brain.

Clinical Signs

Arthritis is seen in goats more than six months old. The animals are lame and the joints are typically swollen. The disease may wax and wane initially, but is slowly progressive, with animals becoming progressively lamer.

Diagnosis

A diagnosis is based on the clinical signs. A blood test can be used to determine if an animal is infected with CAE. Samples of fluid may also be aspirated from a joint to confirm the diagnosis. It is important to recognize that an individual may test positively for the CAE virus and have no clinical signs.

Treatment

None. Anti-inflammatory drugs may help in the short term to keep an animal comfortable.

Prevention

Control of CAE in goats is essentially the same as control of maedi-visna in sheep. (Refer to *Chapter 12, Maedi-Visna*.)