

Regular De-worming Program

Internal parasites can be a major problem for sheep in Ontario. Effective control of internal parasites will make a large difference in the productivity and profitability of your flock. These organisms cause a range of problems including decreased growth of lambs, poor reproductive performance of ewes, and can kill animals if left unchecked. Internal parasites of sheep include worms (e.g. roundworms, lungworms, etc.) and protozoa (e.g. coccidia) that live within the digestive and/or respiratory tract. Damage to the lining of the stomach and/or intestine can be severe enough to prevent nutrient absorption causing diarrhea and severe weight loss. Certain types of worms ingest blood, causing anaemia and weakening the animal.

Although there are a few notable exceptions, the life cycles of most internal parasites are somewhat similar. The adult organisms live and produce eggs in the stomach or intestines of the infected animal. The fertile eggs are passed with the manure and hatch outside the body. After a number of changes, a mobile infective larva is formed, attaches itself to vegetation, and may be eaten by a grazing sheep. The worm reaches sexual maturity after entering the stomach or intestine. The period from when the eggs are passed in the manure until the larvae have reached the infective stage is 3-4 weeks.

With repeated exposures, sheep do develop a natural resistance to parasite infections. This resistance is not as effective as the immunity developed against viruses and bacteria and does not kill the adult organisms. However, the reproductive rate of the parasite is decreased, ultimately reducing the parasite load and the drain on the animal. Therefore, animals most susceptible to parasites are lambs (immature immune system and limited exposure) and animals with weak immune systems (disease, poor nutrition, other stresses). Even though adult animals will be relatively immune, if they are not managed properly they can contaminate the environment increasing the likelihood that vulnerable animals will be infected. Implementing a well-planned parasite management program is a very important aspect of your flock health program.

Chemical dewormers:

Although there are a number of management practices that are important in controlling worms, most effective programs also involve the use of chemical dewormers. Using dewormers at times of the year and/or production cycle when sheep are most vulnerable to parasitism helps increase the effectiveness of treatment and reduce the overall use of chemicals. This will decrease costs and help to maintain the effectiveness of the chemical. (Note: protozoal infections are not treated using dewormers. Discuss treatment with your veterinarian).

One of the most important times to deworm is just after lambing, when there is a sudden release of infective eggs within the ewe's intestinal tract. Treating animals at this time minimizes the exposure of larva to newborn and young lambs.

Examples of deworming schedules are (Consult with your veterinarian and/or producers in your area for other suggestions):

Ewes: Early lambing (January through February)

- Deworming ewes shortly after lambing will help to protect young lambs.
- Deworm ewes again before they go to pasture to prevent pasture contamination.
- If possible, deworm flock again 3 weeks after they have been on pasture
- Deworm ewes at weaning time

Ewes: Late Lambing (April through May)

- Deworm ewes in mid-winter (January, February) before the spring thaw, to prevent heavy contamination of pens or corrals during spring thaw
- Deworm ewes shortly after lambing (before sheep go to pasture) and at weaning time

Weaned lambs:

- Deworm lambs at weaning time or before they enter feedlot or new pasture.

Replacements

- Deworm all newly purchased stock when they arrive on farm at beginning of quarantine period and again 3 weeks later.

After deworming it is advisable keep animals in the same area for 12-24 hours, and then move them to a clean pasture or pen. Moving animals to a new pasture immediately after deworming will contaminate the pasture, as eggs will be passed with the dead worms. Animals will become re-infected sooner if they are put back into the original pasture.

Resistance to dewormers:

Repeated use of the same dewormer can promote the development of strains of resistant parasites. This means that the dewormer will not be very effective and a large number of the worms will survive after treatment. These worms may pass their resistance to their offspring, creating a new line of resistant parasites. Resistance to dewormers is a growing problem for the sheep industry and as dewormers lose their effectiveness, there are fears that economic losses from parasites will increase. In addition, there are concerns that certain types of these medications may be having a harmful effect on dung beetles (thought to naturally disperse and reduce worm eggs). Reducing the amount and the number of times medication is given will slow down the build up of resistant worms on the farm. The following strategies can help avoid this problem.

Fecal Egg Counts:

Fecal egg counts (done by your vet) are important to determine the level and type of parasite infection. Fecal egg counts before and 10 days after the deworming also help ensure that the dewormer is effective. There should be a decrease of least 85 percent.

Rotating De-wormers:

There are three main groups of wormers—benzimidazoles (e.g fenbendazole); imidazothiazoles (e.g levamisole); and the avermectins (e.g ivermectin). Using a different family of wormer each year (for a full year) will help keep the parasite resistance down in your flock. Performing yearly fecal samples will help to determine if resistance to a particular group of dewormers is occurring.

Nutrition and Health

Parasites are opportunists; as long as the animal is healthy and well cared for, the parasite load will be minimal. However, a poor immune response in stressed or malnourished animals will give parasites a chance to thrive. Animals in this situation are doubly affected, as they must fight the parasite infection as well as the original problem. A high parasite load is often a sign of other health problems, usually poor nutrition. Infected sheep provided good nutrition are, in some cases, able to reduce their worm load significantly.

Pasture Management:

Many parasite larvae do not climb higher than a few centimetres from the ground. Since sheep are able to graze close to the ground, they are generally more susceptible to parasite infection than other livestock. Good pasture management can help reduce parasite problems in grazing sheep. Allowing pastures to 'rest' for 6-12 months will help break the parasite lifecycle and clear the pasture of worms, if you have the land base and/or other species on your farm. Other effective methods are to graze hay fields, cropland, or grazing pastures with livestock not affected by sheep parasites (cattle and horses are good, not goats).

Although time between rotations may not be long enough to have a direct effect on larvae populations, rotational grazing programs may help reduce the effect of parasites by providing better nutrition. In addition, as mentioned earlier larvae do not crawl far from the ground, therefore it is important to prevent sheep from grazing the grass down too far. Pasture rotation will also help reduce the amount of fresh manure in the pasture. When possible, livestock avoid grazing near their own feces. As larvae will migrate only ~30cm from the manure, livestock will eat fewer larvae if stocking rates and rotation times are appropriate. Larvae

from most worms will die when exposed to dry conditions. Therefore, although overgrazing will increase parasite infections, allowing pastures to become overgrown isn't the answer either, as the larvae population will increase if not exposed to direct sunlight. Maintaining grass at ~6 cm is ideal.

Harrowing fields aids in dispersing manure, as do dung beetles and earthworms in the soil, helping to dry and kill the larvae quickly.

Since lambs are the most susceptible to infection, manage your pasture rotations to minimize their exposure to parasites. Use a "clean" pasture (not grazed the previous year) if possible when lambing on pasture. If pasturing weaned lambs, move them to a clean pasture and allow ewes to graze the infested areas.

Sanitation

For sheep in confinement housing, cleanliness is the best defence against parasites. To help minimize fecal contamination, use feeders that prevent animals from walking on feed or pulling feed onto the ground. Locate waterers to prevent sheep from defecating in water and in areas with sufficient drainage. Pens, especially lamb pens, should be clean and dry.

Genetic Resistance

Resistance to parasites has a strong genetic link, with certain sheep showing a greater resistance to infection than others. Being able to cull susceptible animals would be an ideal means of not only controlling parasitism, but also eliminating the problem completely. Unfortunately, an on-farm method of effectively and efficiently identifying susceptible sheep has not been developed.

Alternative Dewormers

There is little scientific evidence demonstrating that alternative dewormers (e.g. herbs, diatomaceous earth etc.) have positive effects on lamb growth and/or parasite load.

Summary

Parasites will thrive with:

- mild winter
- moist warm spring and summer
- overgrazed or permanent pastures
- marshy or wet pastures

Sheep are vulnerable when:

- very young or old
- poor immune status (stressful conditions, poor nutrition, weather, overcrowding)
- type and numbers of worms

Preventing parasite infestation in sheep

- strategic use of chemical dewormers
- manage pasture rotations to avoid pasturing young animals on fields recently housing older sheep
- avoid marshy or boggy pastures
- prevent overstocking of pasture, but keep grass reasonably well grazed
- break parasite life cycle (rest period, grazing with cattle etc.)
- maintain sanitary conditions in confinement housing
- discuss parasite control with your vet

<i>Common Internal Parasites</i>			
Parasite	Information/Lifecycle	Signs	Diagnosis
Stomach Worms (<i>Haemonchus</i>)	<ul style="list-style-type: none"> attach to the stomach lining suck blood and cause inflammation and ulceration 	<ul style="list-style-type: none"> anaemia (pale mucus membranes) swelling under jaw (bottle jaw) sudden death may occur 	<ul style="list-style-type: none"> fecal exam post mortem exam of dead sheep
Intestinal Round Worms	<ul style="list-style-type: none"> cause damage to the intestinal lining 	<ul style="list-style-type: none"> enteritis, diarrhea, loss of appetite, loss of body condition, death may be sudden deaths of fat ewes with large numbers of these worms present 	<ul style="list-style-type: none"> as above
Lung Worms	<ul style="list-style-type: none"> more common in areas with wet, marshy pastures adults live in lungs eggs are coughed up, and swallowed into the digestive system larvae hatch and are passed with the manure sheep are infected after eating larva with grass 	<ul style="list-style-type: none"> rapid breathing, coughing, weakness 	<ul style="list-style-type: none"> as above respiratory distress
Tapeworms	<ul style="list-style-type: none"> 'sheep-type' of tapeworms are common, since sheep develop an effective resistance to them, they not a great problem 'dog-type' can be a problem for sheep as they form cysts in the muscles which may lead to condemnation of meat. Regular (at least yearly, before pasturing sheep) deworming of dogs coming in contact with the flock is important 	<ul style="list-style-type: none"> not generally a problem to the health of the sheep, unless infestation is very heavy and interferes with normal bowel function (not normally seen in sheep over 1 yr) 	<ul style="list-style-type: none"> found in carcasses at slaughter fecal exam may see worm segments (small white flecks) in manure or on hindquarters
Sarcosporidiosis	<ul style="list-style-type: none"> protozoal parasite cysts in esophagus, abdominal muscles, diaphragm, or cheek muscles causes condemnation of carcass no treatment 	<ul style="list-style-type: none"> no obvious signs 	<ul style="list-style-type: none"> found in carcasses at slaughter
Coccidiosis	<ul style="list-style-type: none"> often a major problem in young stock caused by a protozoa (coccidia) normally present in intestine and in soil sudden changes in diet and stress can cause coccidia to rapidly multiply and cause infection older animals become resistant to infections good feed management (locate feeders and waterers to avoid fecal contamination) locate pens on well drained land (coccidial organisms from the soil are less viable in dry conditions) good sanitation (lots of bedding) if pasturing lambs, avoid using pastures that recently housed older animals 	<ul style="list-style-type: none"> common intestinal infection characterized by thin, watery diarrhea, often bloody most often seen in feeder lambs, 2-3weeks after entering feedlot during initial stages or if lamb is not severely affected, appetite may remain good, but growth and feed efficiency are affected severely affected lambs go off feed, dehydrate, become weak, die 	<ul style="list-style-type: none"> consult with a veterinarian. Although this is a common cause of bloody diarrhea there are other diseases that may cause similar signs – correct diagnosis is important to minimize losses fecal exam for infected animals, anti-coccidial medication (not the same as dewormers) can be obtained from a vet to prevent, provide prescribed daily levels of coccidiostat in ration (rumensin, decox) This type of medication requires a vet prescription for lambs

External Parasites

Parasite	Information/Lifecycle	Signs/Diagnosis	Treatment	Prevention
Sheep Ked	<ul style="list-style-type: none"> wingless insect (6mm) entire lifecycle (~4 months) on sheep keds are most numerous in the fall and winter spread with contact between sheep, worse with overcrowding 	<ul style="list-style-type: none"> restlessness and unthriftiness rubbing and loss of patches of wool adult keds are large enough to see heavily infested lambs may be stunted due to blood loss decreased value of wool (rubbing) decreased value of skins (blemishes from bites) 	<ul style="list-style-type: none"> shearing will remove many keds discuss treatments with your vet (dust or spray insecticide) apply treatments after shearing for best results. 	<ul style="list-style-type: none"> treat on regular basis after shearing avoid overcrowding prevent reinfestation by introducing only clean sheep into the flock.
Lice (Sucking or Biting)	<ul style="list-style-type: none"> sucking lice feed on blood biting lice sometimes feed on wool fibres, but more often on loose skin (scurf) and materials contaminating the wool lice can live for a few days off their hosts 	<ul style="list-style-type: none"> infested animals constantly rub against objects and scratch and bite themselves, so that their wool becomes dirty, ragged and torn. severe cases will interfere with feeding and resting. animals may be unthrifty and young sheep may be stunted in growth. 	<ul style="list-style-type: none"> lice spread rapidly in a flock most infestations occur through direct contact and lice can be controlled best by treating infested animals. clean out bedding and spraying pens before returning animals same treatment recommended for keds are effective against lice. 	<ul style="list-style-type: none"> as above
Blow Flies	<ul style="list-style-type: none"> several species of flies commonly seen during the summer. flies lay eggs in open sores or on moist wool particularly around the hindquarters of sheep after hatching the larvae feed on wool material, invade wounds and/or bore into the flesh of the sheep 	<ul style="list-style-type: none"> affected sheep are normally away from the flock, lying down with their neck stretched out affected sheep lose condition rapidly. maggots and smelly wool are obvious sheep are "eaten alive" by burrowing larvae absorbing toxins produced by maggots causes the sheep to die in a few days. 	<ul style="list-style-type: none"> treatment can be effective if carried out early (do regular pasture checks) shear the animal, and the rest of the flock as soon as possible remove as many maggots as possible by using benzene or chloroform consult with your vet (5 per cent Korlan ointment may be effective) 	<ul style="list-style-type: none"> shear sheep before fly season sheep scouring from a lush pasture should be inspected often tail dock lambs to prevent soiling monitor docking, castration and shearing wounds during the fly season
Mange	<ul style="list-style-type: none"> mites 	<ul style="list-style-type: none"> intense itchiness (scratching, biting, rubbing, broken wool fibres) scabs develop due to rubbing severity and location of the scabs varies. itchiness may cause severe productivity decline 		<ul style="list-style-type: none"> as for lice and keds (avoid buying with new stock most important)
Sheep Nasal Fly	<ul style="list-style-type: none"> fly related to the warble fly of cattle and bot fly of horses prevalent in all parts of Canada (active during the summer) deposits its larvae on or near the nostrils of sheep. larvae enter nasal passages and sinuses, irritating the membranes. 	<ul style="list-style-type: none"> large amount of nasal discharge is present discharge may interfere with breathing. sheep may push their nose into the ground or against other sheep to keep the flies away. This interferes with feeding and resting, preventing animal from thriving. in severe cases, nervous disorders may be seen and heavy losses may occur. 	<ul style="list-style-type: none"> none 	<ul style="list-style-type: none"> infestations are less severe if sheep are given opportunities to escape from the fly (pastures with access to sheds or dense clumps of brush)