

Internal parasites

A costly problem

Internal parasites are a significant animal health issue on many deer farms.

Young deer carrying internal parasites may have significantly decreased growth rates, along with increased death rates, when compared with deer not carrying parasites. This is largely due to a reduction in voluntary feed intake by infected animals.

Slower growth rates can be costly. Slaughter animals may get a lower schedule price if they miss the spring schedule peak. Yearling hinds may not be heavy enough to achieve good conception rates in the autumn. In addition, there is the cost of extra feed getting them up to target weights.

Control principles

Aims

Aim your control programme at:

- Reducing the level of larval challenge on pasture
- Encouraging deer to develop natural immunity to parasites.
- Preserving the effectiveness of drenches by delaying resistance.

Underlying factors

- The rate of larval development closely follows the rate of pasture growth. Warm/moist conditions favour the development of larvae from eggs in pasture. When the pasture is growing well, the parasites are growing well.
- Larvae are killed by frost and very hot dry weather, but eggs are more resistant.
- Intensive farming at high stocking rates tends to increase the larval challenge.

Key points

- Internal parasites are a significant animal health issue on many deer farms.
- The most significant parasites are lungworm and *Ostertagia*-type gutworms.
- Deer develop immunity to parasites with age. Younger deer (under 1 year old) are more susceptible than older deer. Wapiti are slower to develop immunity than red or fallow deer.
- Reducing the larval challenge needs to be one of the main objectives of effective pasture management on deer farms.
- The emergence of resistance to commonly used drenches by *Ostertagia*-type gutworms is a major concern. There is evidence to suggest resistance is widespread.
- To delay the emergence of resistance, adopt the principles of refugia (see p3) and use effective combination drenches.
- The management of internal parasites is becoming increasingly complex and needs to be planned. This is best done with veterinary input.

Management tools

Monitoring

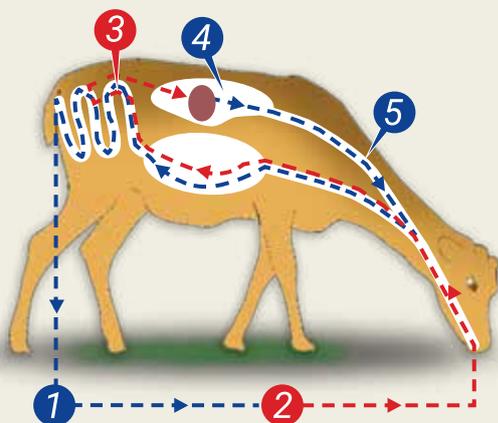
Weaners need regular drenching from late summer or autumn to protect them until they develop natural resistance to internal parasites.

Experience, local knowledge and sound veterinary advice will help you determine when to start drenching weaners.



Young deer infected with internal parasites have significantly decreased growth rates, compared with deer that do not have parasites

Lungworm



The lungworm life-cycle

1. First-stage larvae passed in faeces and matures to L3 on pasture.
2. Infective L3 larvae consumed with pasture.
3. Larvae pass through the stomach, penetrate intestinal walls and migrate to the lungs.
4. Development to L5 larvae and maturation to adulthood in air passages of the lungs.
5. Adult worms lay eggs which are coughed up and swallowed, hatch to L1 larvae and are passed out in faeces.

Cause

Lungworm, *Dictyocaulis immitis*, is a significant risk for young deer from late summer/early autumn

Prepatent period

The time from ingestion of infective L3 until deer are shedding L1 in faeces: 23 days

Signs

- Moderate burdens cause reduced weight gain and coughing, which is made worse with exercise.
- Heavy burdens cause ill-thrift.
- Severe burdens cause death.

Each farm and each season is different.

Heavy parasite challenges are often associated with high stocking rates, low pasture residuals and irrigation.

Under hot dry, droughty conditions which hinder larval development, worms may not become an issue until March. Under warm, wet summer conditions which favour larval development it may be necessary to start drenching in late January.

The best monitoring tool on deer farms is a set of scales. By regularly weighing young deer you can track growth rates and compare them with charts of expected liveweight gains.

Any unexplained drop in liveweight gain – or clinical signs such as coughing, ill-thrift or scouring – may point to an internal parasite issue. Drench with effective anthelmintics immediately.

If anthelmintics have already been given and the signs are still present, then it may point to anthelmintic resistance or other disease issues. Consult your vet.

Faecal egg counts (FEC) and faecal larval cultures (FLC) may be useful in early autumn to indicate when to start

your weaner drenching programme. They are not useful in older deer, because deer over eight months of age develop a degree of resistance to parasites that suppresses parasite egg production. This results in a poor correlation between FECs and number of internal parasites in deer. The faecal egg count reduction test (FECRT) to determine drench resistance is also unreliable in deer.

Grazing systems

Good feeding means leaving a residual pasture cover of 1600 kg DM/ha or greater after grazing. Leaving high residuals not only produces optimum growth rates, it also allows deer to develop good parasite immunity at an earlier age.

Also, with high residuals, the deer graze the top part of the sward, which means their larvae intake will be lower. To achieve this, rotational grazing is normally better than set-stocking.

Refugia

Creating refugia is vital for combating the development of drench resistance. It means keeping a population of parasites on the farm that are genetically susceptible to drenches. Parasites from this population can then be used to dilute the proportion of resistant parasites on the pasture.

Reducing the overall population of parasites on the farm is of course still vitally important. The challenge is to ensure that this population contains a good proportion that are susceptible to drenches.

Practical examples of good refugia management are:

- Graze clean pasture with undrenched deer (eg adults) before grazing by weaners.
- Leave a portion of the mob undrenched, run some undrenched hinds with each mob, or cross-graze with undrenched adult stock.
- Don't have finisher-only blocks.
- Avoid drenching adults (possible exceptions are stressed/immune compromised adults, such as stags after the roar, 2 year-old hinds coming out of first lactation and some wapiti bulls).

Cross-grazing

Cross-grazing involves using other species to 'mop-up' deer parasites. This helps reduce larval challenge and can also have benefits for pasture quality.

Cross-grazing with cattle or sheep at a 50:50 SU ratio dramatically reduces lungworm burdens but is not as effective against gutworms. This is because deer lungworm are host-specific, whereas some gutworm species can be hosted by sheep and deer, or cattle and deer.

Deer *Ostertagia*-types can readily infect cattle. Cattle *Ostertagia*-types and sheep *Ostertagia*-types do not readily infect deer. *Haemonchus* and *Oesophagostomum* do infect deer.

Genetics

There is a genetic variation between animals in their ability to withstand parasites.

The CARLA saliva test measures the levels of an antibody against parasite larvae in animals that have been exposed to the parasite. Preliminary research shows CARLA levels are negatively correlated with worm counts in deer. This means breeders may one day be able to use this test to select herd sires with the ability to resist internal parasites.

But for now, pasture management is the main practical tool available to commercial farmers for reducing the impact of internal parasites in their herd.





Cross-grazing with cattle

This can help reduce the larval challenge, particularly from lungworm which are host-specific

Drenching

An ideal drench needs to be effective (against both lungworm and gut worms) and delay the development of resistance. There are no such drenches registered for use in deer.

In on-farm trials it has been shown that some drench combinations are effective at controlling internal parasites, while also delaying the onset and development of drench resistance, especially when used in a management system involving refugia.

The more highly-effective unrelated actives there are in a combination drench, the better its resistance-delaying properties.

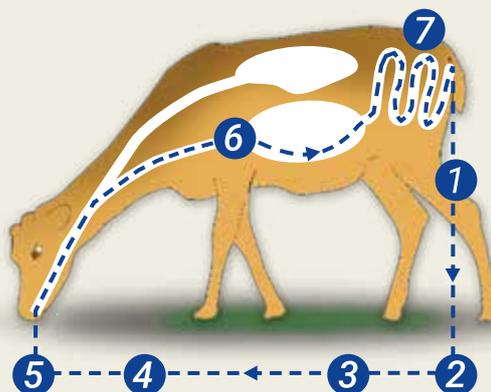
Based on the latest trials the following recommendations have been circulated as a guide to deer farmers. Before embarking on change, it is important to discuss your parasite control programme with your vet.

Current guidance:

- Do not use a drench that contains a single active.
- Do not use a pour-on drench.
- Only use a triple combination, containing mectin, white and clear actives.
- The following is an example of such a programme. Your vet can advise you on which products will meet these criteria.
 - Moxidectin injectable as the mectin component at the standard cattle dose rate = 1 ml per 50 kg.

Regular injections are not ideal, but there is no suitable oral alternative at present. Take care when injecting to inject under the skin of the neck, not into the muscle.

Gutworms



A gutworm life-cycle

1. Eggs passed in faeces.
2. Eggs hatch and start to develop.
3. L1 and L2 larvae in dung pat.
4. L3 larvae move into pasture and are resistant to drying and cold temperatures.
5. L3 moves up pasture in water film and are ingested.
6. L3 develop into L4 in the wall of the abomasum.
7. L4 emerge from the abomasum wall, become adult and lay eggs in the intestine.

It takes about 21-28 days from the ingestion of L3 larvae to shedding of eggs in the faeces and about six weeks for the lifecycle to be completed under ideal conditions

The general rule of thumb is, 'when the pasture is growing well, the parasites are growing well'

Cause

Ostertagia-types are the most important and common gutworms. Other, much less common, gutworms that can cause problems are *Haemonchus* (usually confined to the upper North Island) and *Oesophagostomum*.

The *Ostertagia* risk to young deer increases during autumn. In some regions and breeds (hybrid and wapiti) this extends into spring.

L4 larvae cause the most harm, by damaging the lining of the abomasum, causing it to become thickened. Acid-producing cells are lost, causing a rise in pH which reduces the ability of the abomasum to absorb nutrients. Protein is lost into the bowel.

Prepatent period

The time from ingestion of infective L3 until deer shed eggs in faeces: 18 - 25 days

Signs

- Moderate burdens cause poor weight gain.
- Heavy burdens cause weight loss, scouring and 'bottle jaw'.
- Severe burdens cause death.
- Severe burdens in adult wapiti can contribute to 'Fading Elk Syndrome', which results in severe weight loss and possibly death.

SEEK ADVICE

The management of internal parasites is becoming increasingly complex and needs to be planned. This is best done with veterinary input. Internal parasite management is normally a central pillar of a planned deer health programme.



Young wapiti on pasture of good length
High residuals ensure young deer grow faster, with lower worm burdens

- Oxfendazole oral as the white/BZ component at 3 to 4 times the standard sheep/cattle dose rate.
- Levamisole oral as the clear component at 1 to 2 times the standard sheep/cattle dose rate. Do not give more than a double dose of levamisole – higher doses can be fatal.
- **It is critical to seek veterinary advice before using a triple combination to ensure that the risk of drug residues is appropriately managed.**
- **Any combination of drenches constitutes an off-label use and has a default 91 day meat withholding time (WT). The 91 day WT is an arbitrary number and does not give legal protection if residues occur. It is a legal offence to sell animals for slaughter with drug residue.**

Drench frequency

The aim is to reduce the contamination of pasture with drench-susceptible larvae to low levels, rather than to eliminate the contamination entirely. By drenching at 28 day intervals (which is longer than the prepatent period), some susceptible larvae will survive the drenching programme and complete their life-cycles.

Treat weaners at 28 day intervals from late-summer/early autumn:

- In the North Island, the 28 day interval will continue until August (5-6 drenches)
- In the South Island the 28 day interval will continue until June (3-4 drenches)
- Drenching in spring is based on risk factors for individual farms. Seek veterinary advice.
- Wapiti bulls and young red breeding stags should be given an effective drench immediately post-roar – late April/early May.

Quarantine drenching

Drench all stock brought onto the farm to prevent resistant worms arriving with them. Because it is critically important to ensure any resistant worms are killed, ask your vet to advise you on the most effective drench combination to use.

Following drenching, put the incoming deer in a contaminated sacrifice paddock for 24 hours before allowing them access to the main farm.

More >>

The latest information on internal parasite management is on the Deer Hub: www.deernz.org/parasites