

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. This is where the vast majority of parasites exist.
- Encouraging deer to develop natural immunity to parasites.
- Where drenching is required, using only those drenches that are effective for deer. This will delay the onset of drench resistance and preserve the effectiveness of drenches.

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 practices that reduce the need for drenching, use 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.

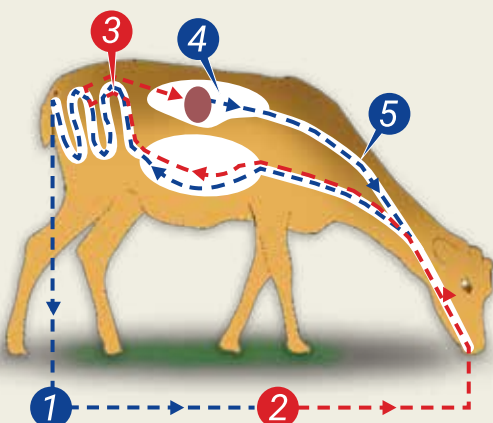
Management tools

To successfully manage parasites, it is important to use all the management tools that can be applied on your farm. Remember that an effective drench only kills those parasites in the animal (approximately only 10% of parasites on farm at any one time).



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 eckerti*, is a significant risk for young deer from late summer/early autumn and may sometimes occur in spring.

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.

Risk factors

On most farms 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. Each farm and each season is different.

Post-rut weaned deer cope with parasite challenge much better than pre-rut weaned deer and require less drenching.

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

Under hot, dry, droughty conditions that 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.

Monitoring

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

Higher post-grazing residuals are best for deer health and growth rates. Leave a residual pasture cover after grazing of at least 1250 kg DM/ha (2 cm), but aim for 1500-1600 DM/ha (4 cm) if the season allows.

A higher residual means the deer graze the top of the sward, avoiding most of the L3 larvae, which live in the bottom 2 cm. To achieve this, rotational grazing is better than set-stocking. Leaving higher residuals maximises pasture and deer growth rates, lowers the intake of larvae and allows deer to develop good parasite immunity at an earlier age.

Pasture type also impacts level of larval challenge. Grass-dominant pastures are easier for infective L3 larvae to migrate up. It is more difficult for them to climb the foliage of clover, lucerne, chicory and fodder crops. These feeds may also provide better nutrition, thereby enabling deer to perform better in the face of a parasite challenge, while also reducing the risk of facial eczema, which is of increasing concern during autumn in warmer regions.

Plants with high levels of condensed tannins (CTs) may help deer cope with parasites. These include (listed from high to medium CT levels) Kinuyanagi willow, sulla, lotus major, birdsfoot trefoil and plantain.

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

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

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 either lungworm or Oster-type gutworms. This immune response affords some protection against infection by parasites.

CARLA is a heritable trait. Deer with higher CARLA have fewer adult worms and shed lower numbers of both lungworm larva and gutworm eggs. Young deer with high CARLA grow faster.

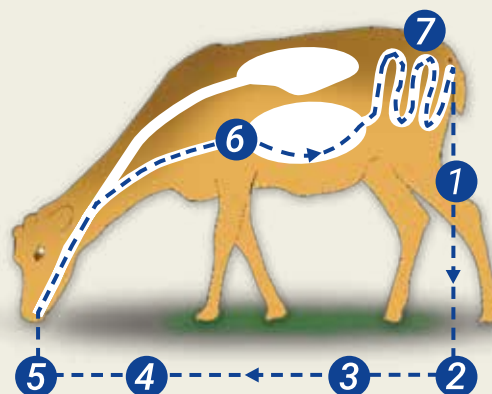
Commercial farmers can test their replacement hinds at around 10 months old and use their CARLA results in selection decisions. More powerful is the selection of terminal and maternal replacement sires with high CARLA eBVs as all their progeny will be positively influenced.

Drenching

Deer farmers are strongly advised to discuss their parasite control programme, including drenching, with their vet.

An ideal drench needs to be effective (against both

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 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

lungworm and gutworms) and contain active ingredients at optimal concentrations for deer. The more highly-effective unrelated actives there are in a combination drench, the better its resistance-delaying properties.

There were no such combination drenches registered for use in deer until July 2021, when Cervidae Oral™ was registered. In on-farm trials, the combination of drench actives in Cervidae Oral had been shown to be effective at controlling internal parasites in deer. When used responsibly, this combination will delay the onset and development of drench resistance, especially when used in a management system involving refugia.

Based on this development, here are the recommended guidelines for drenching deer:

- Do not use a drench that contains a single active.
- Do not use a pour-on drench.
- There is only one triple oral drench registered for use in deer, Cervidae Oral™, which is made up of actives at ideal concentrations for deer. It is effective at a practical dose rate and has a 28 day withholding period.
- Any alternatives should be triple combinations, containing mectin, white and clear actives.
- **It is critical to seek veterinary advice before using an unregistered combination to ensure that the risk of drug residues is appropriately managed.**
- **Any unregistered 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.

Risk factors vary between farms and regions. Ground temperatures also play a part – most parasite larvae stop developing when soil temperatures drop below 10 deg C.

Based on treating weaners at 28 day intervals from late-summer/early autumn, the following programmes may be needed:

- In the North Island, drenching at 28 day intervals until August (5-6 drenches)
- In the South Island, drenching at 28 day intervals until June (3-4 drenches)

On some farms utilising management practices that reduce larval challenge on pasture, the drench interval can be extended well beyond 28 days (by default creating greater refugia).

Spring drenching of weaners may also be needed, 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