

wormwise

FOR DAIRY HEIFERS



'Wormwise for Dairy' is a summary of the important points from the existing Wormwise resource, adapted for dairy heifer systems.

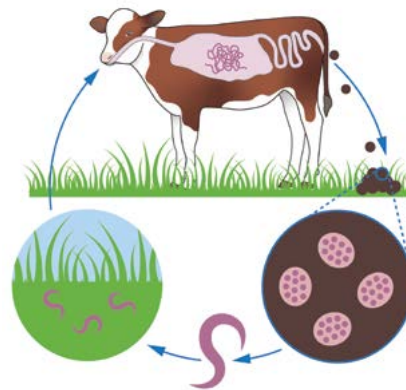
From first winter to first lactation

The following is a set of principles and guidelines for spring-born dairy heifers for the 12 months from the beginning of their first winter. These are usually called 'May to May' heifers. The recommendations also apply to autumn-born heifers. Patterns of parasite infection and recommendations for control in young cattle are more dependent on cattle age than the season; for autumn born heifers, follow the guidelines according to their age. Visit www.wormwise.co.nz for more extensive information.

Calves to heifers - the shift from 'worm factories' to 'worm vacuum cleaners'

Calves under about 6 months of age have little immunity to internal parasites (worms) and are the major 'worm factories' on your farm. For more information on worm management in calves, see: <https://beeflambnz.com/knowledge-hub/PDF/wormwise-dairy.pdf>

The eggs passed in the poo of calves hatch and develop to infective (L3) larvae on pasture that can then be eaten by the next animal to graze that pasture.



In older cattle, only a few of the larvae that get eaten are able to develop into adult, egg laying worms. These adult worms inside older cattle are smaller and produce less eggs that have a lower rate of development once passed out onto the grass. Calves are unable to limit the life cycle in this way, so contaminate the pasture with a lot more worms.

Development of immunity in calves can start from 3-6 months of age. As they grow, their ability to deal with incoming parasites improves in two main ways:

- Their immune system starts to suppress the number of eggs the worms produce and starts to kill off some of the resident worms in the gut.
- Worms become less damaging when they are consumed because the immune response is more effective - less energy and protein are used to fight the parasites and more can be used for growth.

Sometime between 9-18 months of age, heifers develop a level of immunity that means they are no longer shedding many worm eggs - from here they can become 'worm vacuum cleaners.'

How quickly this process happens, and to what degree heifers can cope with grazing pasture with a lot of worm larvae on it, depends very much on the nutrition and growth of the heifers. Poorly grown heifers on suboptimal levels of feed can remain susceptible to worms for much longer than their well grown, well fed counterparts.

The effect of worm challenge on heifer growth rates

When heifers are drenched for worms, the treatment removes worms in the gut for a short period of time, but after the drug is gone, the worms they ingest on a daily basis can have a cumulative effect on growth performance and health, until they develop full immunity to worms.

Young cattle grazing pasture that has high levels of worm larvae on it can show:

- Reduced time grazing
- Reduced time cudging
- Reduced time walking.

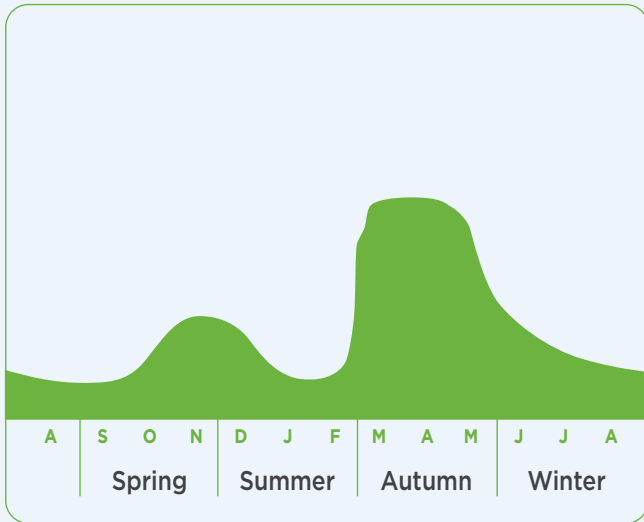
All of this occurs before we see the signs that we associate with worm infection; such as scouring, poor growth or weight loss.

These effects are much more marked under conditions of poor feeding.

Regular drenching will prevent obvious illness from worms but cannot stop the effects of a high daily intake of worm larvae.



Because of differences in feeding, growth and level of maturity in heifers in their first winter, it is not possible to give a 'recipe' for drench use.



Generalised seasonal pattern of infective larvae on pasture in a calf-only grazing system

Worms on pasture in dairy support systems

Where pasture has mostly carried calves

Pasture that has carried mostly calves in the months prior to being grazed by heifers can have high levels of worm larvae on it.

The autumn period usually has great conditions for parasite development; it's warm and wet, and green grass provides a good habitat for worm larvae.

Pasture larval contamination level can be very high entering the winter in areas that have mostly grazed calves in summer/autumn.

An added complication nowadays is drench-resistant worms. If calves have been under regular drench treatment with a product that is not fully effective, the autumn pasture contamination can be dominated by worms that have survived those drenches. These may present a risk to the heifers if they require treatment.

Where pasture has carried other stock

Pasture that has mostly carried older cattle over summer and autumn will present less worm challenge to heifers because older cattle are 'worm vacuum cleaners'.

Pasture that has carried sheep, goats or deer over summer and autumn will present less worm challenge to heifers. Sheep & goats, and deer, generally have different worms than cattle. Lungworm on deer pastures could be an exception depending on how they have been managed.

Other forage types

Forage crops and newly-sown pasture generally present a very low level of worm challenge to heifers because the old resident pasture (and often much of its worm larvae) has been removed and replaced with a cleaner sward.

Parasites do not disappear in winter

Parasite challenge to heifers on grass in winter is driven by the level of worm contamination that has been set up in the autumn.

It takes months, not weeks, for worm larvae on pasture to die off.

The rest of the worm life cycle (egg hatching and development of early larval stages) on pasture slows down in winter, but L3 larvae on pasture are quite resistant to cold conditions.

A few frosts are not enough to kill many L3 larvae – these have a protective double skin that helps them survive, and some species (e.g. *Ostertagia*) can survive a few freeze/thaw cycles. This means that although the worm challenge from grass reduces with time over the winter period, it is never eliminated.

Ways to reduce winter worm challenge

- Grazing alternative forages/crops
- Renewing areas of pasture in the autumn
- Grazing calf areas with alternative animal species (e.g. sheep) to help remove larvae
- Grazing calf areas with adult cattle (dry cows, beef stock) to help remove larvae
- Don't make heifers 'clean up' paddocks – most worm larvae are in the bottom third of the grass sward, keep grazing residuals high for heifers and use another stock class to clean up paddocks, where required.
- Feed heifers really well. Supplement, if required, generally has no worm larvae on it and can help reduce daily parasite challenge.

Total reliance on drench to control larvae on pasture will eventually result in a predominance of drench-resistant worms on heifer grazing areas.

Parasites in spring

During the colder months, L3 larvae go into survival mode and the whole worm life cycle slows down. As temperatures rise in spring, these over-wintered larvae are available for grazing by the next season's calves, and the parasite lifecycle ramps up again. If older cattle or an alternative species graze a previous season's calf paddocks in spring, the worm challenge can be reduced on that area.



Monitoring worm challenge in heifers

Faecal egg counts

Faecal egg counts (FECs) are a measure of worm eggs present in cattle poo. In young calves there is a reasonable relationship between FEC and number of worms in the calf's gut, but by the time they are around 9 months old this relationship may be less strong. For this reason we don't recommend FECs as a key decision tool for when to drench older heifers.

FECs are still useful in the following situations:

- Positive FECs in heifers after a drench are an indication that there is a problem with the drench product or the drenching process. Further investigation is required.
- Where worms are suspected as a cause of poor performance and FECs are moderate-high.
- For further information on interpreting FECs in cattle, visit <https://beeflambnz.com/programmes-partnerships/current-programmes/blnz-wormwise-programme/worm-diagnostics/interpreting>

Liveweight gain

Growth performance is a reasonable gauge for a heifer's ability to deal with worms.

When the immune system has developed sufficiently, well-fed heifers are able to continue growing at good rates despite some worm challenge from pasture. Heifers that are still achieving or exceeding target daily gains on pasture in the absence of a stringent drenching program have likely developed a good functional immunity to parasites.

This knowledge can be used to target drench treatment only to the animals that need it and leave the others as a potential source of refugia on the farm.

Which worms are there?

Two main worms are important in young cattle:

- *Cooperia* is an intestinal worm which is most prevalent in heifers under a year of age, calves in particular. Large numbers can cause very poor performance and ill-thrift.
- *Ostertagia* lives in the 4th stomach (abomasum). This worm can cause very severe disease and even death.



Both of these worms are developing resistance to the commonly used combination drenches, it is important to understand how well these are working.

Lungworm is an uncommon cause of disease in older heifers. Heifers will cough for a variety of reasons, which may not be lungworm.



Sustainable drench use

Heifer drenching - there are no recipes

Because of differences in feeding, growth and level of maturity in heifers in their first winter, it is not possible to give a 'recipe' for drench use. General guidelines are:

- Monthly drenching is likely to be unnecessary.
- If heifers are being weighed monthly, a good approach can be to leave the best-performing animals untreated and only treat the smaller or poorer growing individuals.
- Another approach is to stretch drench intervals out beyond one month. Some farmers drench heifers at 6- or 8-week intervals in winter. Some may only treat at the beginning and end of winter; other less than this.
- Treating heifers for worms before they go home to the dairy farm for calving is a common 'insurance policy'. It may be unnecessary in well-grown animals that have not been under high worm challenge. If you do treat heifers at this time, follow the guidelines below to choose a highly effective product. Treat lice separately.

Choose the most effective product for the worms on board

In general, a combination oral drench containing a drug from the Mectin/ML family is a good choice for cattle in their first winter. For more information on drench families, see: <https://beeflambnz.com/programmes-partnerships/current-programmes/blnz-wormwise-programme/drenching/drench-families>

Oral products have been shown to do a better job of removing drench-resistant *Cooperia* from the small intestine than injectables or pour-ons.

The ML/Mectin component is important to target *Ostertagia*. This worm is more reliably removed by using a combination drench containing a Mectin/ML component, than one that does not contain this drug.

As heifers approach their first birthday and beyond, they start to develop reasonable immunity to *Cooperia*. *Ostertagia* becomes relatively more important with age. It is the dominant parasite in cows. Injectable products containing the Mectin/ML drench family are a good choice to target *Ostertagia*. In heifers where *Cooperia* control is still required, the injectable product should also contain Levamisole.

Pour-on products generally have poorer and highly variable levels of absorption into the bloodstream than oral and injectable formulations. New Zealand research shows that they kill less resistant *Cooperia* than oral formulations of the same drug.

Check the performance of your drench

Drench-resistant parasites are becoming very common on New Zealand farms. Vets are increasingly reporting cases of poor performance, disease and even deaths in calves and heifers from parasites that are surviving routine drench treatments.

It is very important to understand which drenches are working properly on your place.

A first step in checking drench performance is a drench check. This is where fresh poo samples are taken 10-14 days after treatment and checked for the presence of worm eggs. Positive faecal egg counts (FECs) mean worms are surviving your drench.

Only use older heifers for this test if you have done some faecal egg counts prior to drenching, and know that your heifers have positive FECs. It is not uncommon for 9 months-plus heifers to have low or zero FECs. In this case, on the basis of negative FECs after treatment, a drench treatment may appear to be working well, when it isn't, and the heifers simply had no eggs in their poo when they were treated.

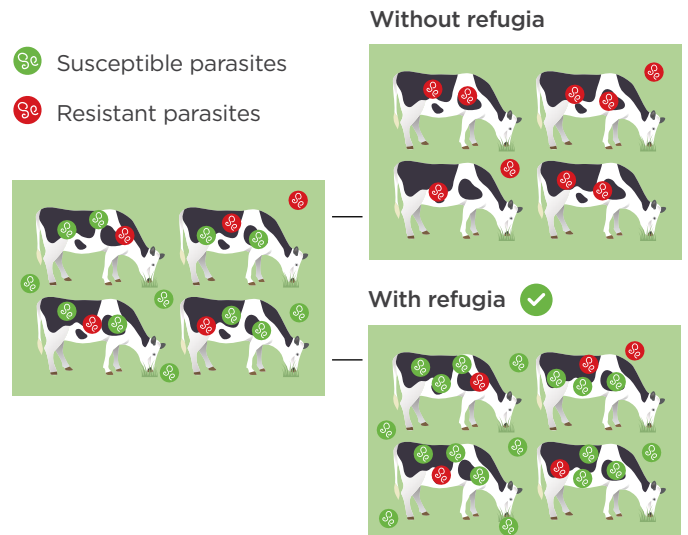
Leave some worms alone - Refugia

When a mob of heifers is drenched, for the next 3-4 weeks (at least), the only worm eggs they pass out in their poo are from worms that have survived the drench treatment. The progeny of these worms make up an increasing percentage of the larvae on pasture over time. As more of these are eaten by young cattle and reproduce themselves, drench resistant worms build up on the farm.

This process can be slowed by leaving a portion of worms unexposed to the drench treatments. This is called refugia.

Options for keeping worms in refugia in heifer grazing systems include:

- Extending drench intervals.
- Including a proportion of older, undrenched stock on the farm so that they contribute some susceptible worms back onto pasture to 'dilute out' any that are surviving heifer treatments.
- Leaving a proportion of the best-performing heifers untreated - over time this can become an increasing proportion of the mob.



Summary

Heifers become increasingly resilient to worm challenge as they mature - the faster they grow, the faster this happens.

References

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Bates A.J, Greer A, McAnulty A, Jackson K; Targeted selective treatment with anthelmintic for New Zealand dairy heifers. *Veterinary Parasitology* Volume 309, September 2022.

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