



American Consortium for Small Ruminant Parasite Control

Best Management Practices for Internal Parasite Control in Small Ruminants

THE PERIPARTURIENT EGG RISE

Internal parasites are a major health problem for small ruminants raised in warm, humid conditions. In particular, the barber pole worm (*Haemonchus contortus*) is an avid blood feeder that can cause anemia and death, if left untreated in susceptible animals. Dewormer resistance is widely prevalent in the US, thus targeted selective treatment (see fact sheet) should be used when animals are most susceptible.

While young, growing lambs/kids are the most vulnerable to the effects of internal parasitism, breeding ewes/does are susceptible to the negative effects of parasitism in the period immediately before, at, and following lambing/kidding. This period is called the “periparturient egg rise,” (**PPER**), and it refers to a rise in fecal egg count (**FEC**) (or parasitic infection) in the ewe/does. It may last from a few days before birth until up to 8 weeks after, depending on breed and other factors, but typically peaks about 30 days post-lambing/kidding.

It is also thought that coccidia (*Eimeria* spp.) and other protozoan (*Cryptosporidium* and *Giardia*) oocysts in feces increase as well. Milk yield and persistence of lactation can be reduced by 10 to 15% in ewes/does infected with parasites, leading to lower growth rates and increased death loss of lambs/kids. Clinical mastitis may also be more prevalent in parasitized ewes/does.

The periparturient egg rise also has implications for risk of infection in susceptible young lambs/kids. The dam’s contribution to infection in lambs/kids comes from the worm eggs she deposits in her feces onto the pasture during the periparturient period. Higher fecal egg counts result in more pasture contamination, which leads to more infection in the offspring. Lamb/kids have little immunity to worms and infection can lead to poor growth and death.

CONTRIBUTING FACTORS

Dams that give birth to multiples compared with single offspring are more susceptible to parasite infection during lactation, usually having higher fecal



Periparturient ewe

Image by Joan Burke

egg counts. Yearlings are more susceptible than mature females and should be managed separately so they and their offspring can be more closely monitored for clinical signs of parasitism. High producing dairy females are also more prone to parasitic infection.

Higher quality feed should be provided during the periparturient period. In fact, nutritional status influences tolerance to internal parasites and affects the severity of the periparturient egg rise. Ewes/does in poor body condition will be more susceptible to parasites around the time of lambing/kidding. Nutrient requirements increase in late pregnancy and early lactation. Females can mobilize fat and muscle to meet the needs of the growing fetus(es) and milk production. Feeding a higher plane of nutrition compared with a low-quality diet approximately one month before lambing/kidding can reduce the magnitude and duration of the periparturient egg rise.

Anything considered as poor management will increase parasitic infection and lead to increased larval numbers on pastures. This includes over stocking, over grazing, and animal stressors, such as transportation, rough handling, etc. All of these will drive up the periparturient egg rise.



The periparturient egg rise can lead to more parasite infection in offspring.

Image by Susan Schoenian

Genetic Selection to Reduce the PPER

Fecal egg count records in lambs have been used for genetic evaluation of parasite resistance in sheep. Parasite resistance in growing lambs is a moderately heritable trait. However, evaluating fecal egg counts to determine parasite resistance in growing lambs/kids can be challenging. Young lambs/kids are particularly vulnerable to the effects of parasitism, but if selection is to be effective, the parasite challenge must be sufficient (at least 500 eggs per gram of feces) so that differences in resistance can be identified.

Katahdin sheep farms that have collected fecal egg count data often find that fecal egg counts are too low to express adequate variability among lambs. Careful monitoring of parasite levels and prompt treatment of potentially parasitized lambs following data collection is necessary to obtain useful information, but also minimize losses due to parasites.

Estimated breeding values (EBVs) for weaning and post-weaning fecal egg count are available through the National Sheep Improvement Program (NSIP; nsip.org). Collection procedures are described on the NSIP web site. EBVs are a more accurate selection tool than fecal egg counts by themselves because EBVs utilize data from relatives and correlated traits and are adjusted for environmental influences. An EBV is a numerical estimate of an animal's genetic merit for a given trait. See the fact sheet on genetic selection.

REDUCING THE IMPACT

The periparturient egg rise is a major factor in ewe/doe productivity and infection of lambs/kids, affecting their weaning weights and mortality. By understanding the periparturient egg rise, producers can implement management practices to minimize the effects on productivity. The following are methods to reduce the severity of the periparturient egg rise. A combination of practices will yield the best results.

- **Selectively treat ewes/does prior to lambing/kidding** (see TST fact sheet). During warmer months, it may be necessary to deworm all ewes/does prior to lambing/kidding or prior to them leaving the barn to graze pastures, especially if signs of parasite infection are present (e.g. several females with high FAMACHA[©] scores, presence of bottle jaw, high egg counts). If this approach is used routinely, selection for worms resistant to dewormers will occur. Ewes/does bearing multiple lambs/kids, or yearlings will be more susceptible to parasites and could be selected for treatment during the periparturient period. Similarly, high producing dairy females are usually good candidates for deworming.
- **Select parasite resistant ewes/does** within a breed or raise more resistant breeds to minimize contaminating pasture. See sidebar on genetic selection.
- **Sort off ewes/does raising single lambs/kids and intensively manage dams raising multiples by providing extra nutrition** Aim for a body condition score of 3 to 3.5 at the time of lambing/kidding.
- **Increase quality and/or quantity of feed, particularly protein** about a month before lambing/kidding to minimize the periparturient egg rise. By-pass protein has been shown to be especially beneficial.
- **Feeding forages with condensed tannins (such as sericea lespedeza)** has been shown to prevent a periparturient egg rise in ewes/does.



First time mothers (yearlings) are more susceptible to the periparturient egg rise and should be managed accordingly.

Image by Susan Schoenian

- **Use BioWorma® in periparturient ewes/does on pasture** to minimize contamination. Thus, even if fecal egg count increases in ewes/does, because BioWorma® acts on larvae in the manure, there will be substantially fewer larvae for lambs/kids to ingest and get infected. However, ewe/does will still need dewormed, if they exhibit signs of parasitism.
- **Lamb/kid indoors** so that contamination of pastures by periparturient females does not occur. Indoor lambing/kidding requires adequate housing and is usually an added cost. Lambing/kidding in dry lot (zero grazing) is usually a less expensive option.
- **Lamb/kid at a time of year when parasites are not prevalent on pasture (usually winter or fall).** However, be mindful that early spring lambing/kidding will lead to late spring or early summer weaning of offspring when conditions for parasites (particularly barber pole worm) are ideal.

Minimizing the periparturient egg rise in ewes/does through management will pay off by reducing the detrimental effects of parasitic infection in offspring.

Genetic Selection to Reduce PPER

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Collection of fecal egg count data on adult animals has been proposed as an alternative to collecting data on growing animals. Adults (especially sheep) are less susceptible to the negative effects of parasitism and are better able to cope with infection. The heritability of periparturient fecal egg counts is considered to be low to moderate. Egg counts in periparturient ewes have been shown to be repeatable across years of production, meaning culling ewes with high egg counts will reduce contamination of pasture and subsequent infection of young stock.

Is there a cost of parasite resistance on production and reproduction?

Farms that select for higher post-weaning weights (typically larger, more late-maturing sheep) may be somewhat more vulnerable to the periparturient egg rise under the stress of lactation, resulting in ewes having higher FEC around 30 days post-lambing. However, lambs selected for parasite resistance using FEC EBVs, have higher weaning weights. More prolific ewes (higher breeding values for number of lambs born or weaned) may be more susceptible to internal parasites, but this genetic antagonism is small and can be managed by selecting on both periparturient FEC and number of lambs born/weaned.



The periparturient egg rise often coincides with the “spring rise,” when hypobiotic larvae are resuming their life cycle.

Image by Susan Schoenian



Indoor lambing/kidding can be an effective strategy for managing the periparturient rise.

Image by Susan Schoenian

SELECTED REFERENCES

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