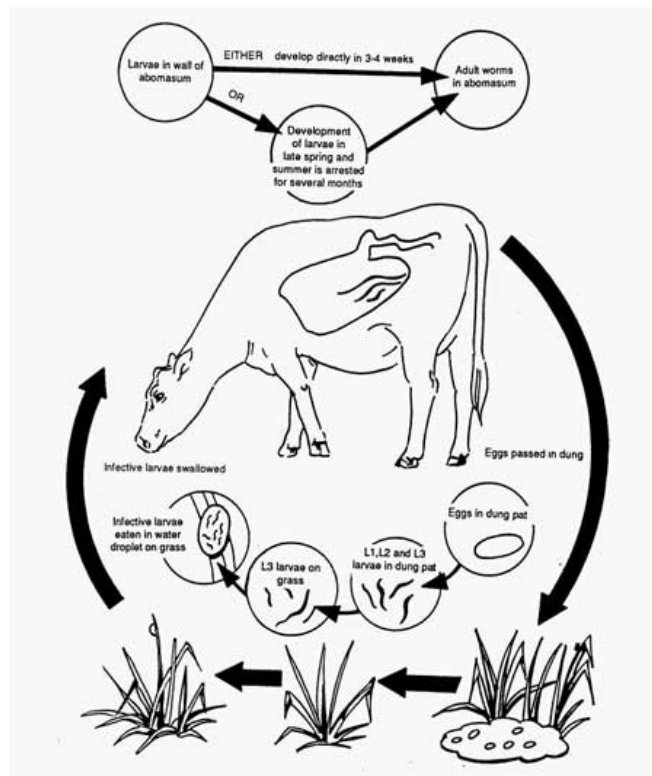


Integrated Parasite Management for Organic Dairy Cattle

By Ann Wells, DVM

Parasite control with minimal or no chemical dewormer use requires a combination of extremely good management techniques and possibly some alternative therapies. Organic producers must be aware of the incidence of parasites in their animals. Cattle will be easier to manage than sheep or goats and older animals will be easier to manage than younger animals. Observation, testing and monitoring animals will be crucial to determining progress and success. Alternative parasite control is an area that is receiving a lot of interest and attention. Programs and research will continue in the pursuit of parasite control, using alternative and more management-intensive methods.

For organic dairy cattle producers, the parasite of most concern is *Ostertagia ostertagi*, the brown stomach worm. Type 1 disease occurs in calves and causes green diarrhea, bottle jaw, weight loss, unthriftiness and low vitality. Type 2 disease occurs when arrested larvae in the abomasal lining descend due to weather conditions conducive to survival. This form will affect adults primarily. The life cycle of the *Ostertagia* is shown in the accompanying graphic.



Poor nutrition will mimic parasite problems. Good nutrition will prevent parasite disease even if animals have parasites. Poor sanitation will worsen parasite problems. Changing basic animal management will often take care of what was thought to be parasites. High stock density in an area will increase the chances of harmful levels of larvae.

Healthy adult cattle should have enough immunity that parasites won't be a problem. If they are a problem, then the worms should be used as a symptom that something else is wrong in the farming system. Other diseases, poor nutrition, poor weather or some other management mistake needs to be considered.

Determination of parasites

The producer needs to figure out if internal parasites or worms are actually a problem. If they are a problem, then, what can be changed about the farm to make these parasites less of a problem?

Worms become a problem when calves are raised on the same ground year after year. This is due to the survival of overwintering larvae from the previous year. Immunity to the worms starts at weaning and may take up to two years for *Ostertagia*. This immune response can be enhanced by good nutrition. Fecal egg counts (FECs) can be run to see if the levels are indicative of parasitic disease. Keep in mind though, that due to that immune response and to genetic resilience, some calves may have high egg counts and show no signs of parasites. Calves with FECs of 300-600 are usually going to show other signs of parasites.

If worms are a problem, the first thing to do is to move calves to a different area. Letting a piece of ground rest for one year will make it safe again for calves. The goal is to limit exposure to the worm larvae when calves are young

before their immune system can handle the worm burden. In addition, high levels of nutrition, controlled rotational grazing, certain pasture plants and possibly certain herbal products will lessen the problem of worms in calves.

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Grazing Management

It has been stated that goat producers who don't rotationally graze their goats will end up with insurmountable worm problems. Ten years ago, Dr. Louis Gasbarre received a SARE grant to study the impact of parasites in dairy cattle that were being intensively grazed (McBride, 1998). Research in both the U. S and internationally shows that controlled rotational grazing is the best defense against internal parasites in cattle. It's important to put calves on ground that hasn't had cattle on it for at least six months. Rotating them through pastures so they aren't overexposed to larvae, keeps infestation to a minimum. Having pasture heights in the 6-10 inch range, removing them when grass is no shorter than 2 inches and not forcing the calves to graze

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close to manure piles will also prevent infestation.

A better way of grazing these pastures, and one that will also allow more utilization of forage is to have the young calves graze through, followed by older cows whose immune systems are fully developed. Calves will be more selective than older cows, grazing the most nutritious and most palatable forage. Older cows will still get excellent nutrition but will eat more of the available forage. The rest period will allow forages to regrow and soil organisms to degrade and remove manure. Calves under the age of 5 months should not re-graze those pastures that year.

This management strategy has been used successfully on organic farms in Switzerland (Hertzberg, 2002). These farms grazed different age groups separately and moved them among different pastures. Those farms unable to carry out this grazing strategy had high FECs in their calves and the calves showed unthriftiness.

North Carolina State University carried out a study on dairy steers in 2004. Calves born in fall of 2003 hadn't been dewormed at all and showed no rise in FECs compared to a control group of calves given a dose of Ivermectin in the spring. These calves were pastured starting at birth, but on pasture that did not have any cattle on it from March to mid-September (Washburn, personal communication).

Herbal leys

Herbal leys are pastures that have a combination of grasses, legumes and forbs, plants most of us know as weeds. The concept was developed in the early 1900s in Clifton Park. Although all the plants are important for nutritional purposes, it's the forbs and some of the legumes which are the focus for those of us looking for alternatives for chemical dewormers.

Most of the plant research has been aimed at sheep and goats, as they are the animals most severely affected by worms. But the concepts will fit all ruminants. There are a number of plants that have been researched, but I will discuss the ones most apt to have application in the northeast U.S.

These plants contain either condensed tannins, or sesquiterpenes as the compounds showing anti-worming activities. The plant which research shows has the most definitive effect on worms is sericea lespedeza. Goats grazing sericea had FECs drop to extremely low levels in two days time (Min, 2004). Within two weeks after the goats were removed from the sericea, the FECs had climbed back to pregrazing levels. Sericea has high levels of condensed tannins. Now sericea is a noxious weed in the central U.S. In the eastern U.S., it's hard to establish and hard to maintain stands. However, birdsfoot trefoil, which can be grown in the northern U.S., appears to have the same effect. The condensed tannins prevent the adult worms from laying eggs. There is some preliminary evidence that they also have an effect on the vigor of the worms, but that has not

been substantiated. Chicory is another pasture plant that has been shown to have a negative effect on internal parasites (Marley, 2003). Puna chicory is a forage variety that can be grown in the U.S.

These plants can be planted within pastures or hedgerows or most preferably in an herbal pasture that animals have access to periodically. Many of the herbal forbs are highly palatable, have a longer rest period than the grasses, and can be more easily overgrazed. By having an herbal "medicinal" pasture, the animals can be offered it for a short period of time, and rested otherwise.

Animal Selection

Research for all ruminant species is showing that 80% of parasite problems occur in only 20% of a particular herd or flock. While it can be difficult to cull an organic animal based on its parasite status, doing so may benefit the farm by improving the overall health of the herd, increase the amount of milk produced and sold and decreasing contamination of pastures for newborn calves.

Keep records of animals with high FECs. If an animal does need to be dewormed with ivermectin, seriously consider culling that animal and any offspring or siblings. Do not overlook the genetics of the bulls. If one calf crop has more problems with worms, consider the possibility it is due to the bull used that year.

Producers who add parasite susceptibility to their list of culling factors find that in 2-3 years they have greatly decreased the incidence of parasite problems in their herds or flocks.

Herbal Deworming Products

There are several herbal deworming products, besides diatomaceous earth, which may have some potential. There has been on farm studies of several of these (Allen, 1998, Drazenovich, 2003, Murphy, 2001). All have been carried out on sheep farms. Grazing management, with clean pastures at the beginning of the season, has been one of the primary strategies seen to be effective. However, there is some indication that some of these products may have a beneficial effect. The effect may be due to something other than direct effect on the worms.

Most of these products have wormwood (*Artemisia absinthium*) as the main ingredient, which should be used with caution, if at all, on pregnant animals. Some also require a tonic to be given on weeks when the deworming treatment is not given. For producers with many animals, using these products may be prohibitive. However, dairy producers who are handling their animals individually every day will have an easier time of administering these products.

The latest product to be tested on sheep for deworming is a garlic product called Garlic Barrier (Noon, 2003). Garlic has known antibacterial effects, which may be the effect responsible for its success as a deworming product. Bacterial enteritis often accompanies parasitic disease. This study showed that egg counts went down

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after sheep were treated with the garlic product.

While I have not tried any of these products, I am working with a farm in central Arkansas for the second year that is interested in transitioning their sheep flock to organic production. Parasites are their biggest concern. Last year we managed the sheep flock strictly with rotational grazing and mixed grazing with beef cattle. This year we will be adding in an herbal dewormer plus seeding some pasture area to sericea lespedeza this spring and puna chicory this fall. I also want to try planting *Artemisia absinthium* and allow the sheep access to it to see if they will willingly graze it.

Ivermectin Resistance

The reason that management strategies, pasture plant research and alternative dewormers are such hot topics for the sheep and goat industry is that parasite resistance to all the currently available chemical dewormers has reached a crisis point. There are farms around the world, including the U.S., which no longer have a single chemical dewormer that is effective. Under NOP, Ivermectin is to be used only in an emergency situation and never routinely and must have a 90 day milk hold out and cannot be used on slaughter stock.. Couple that with the fact that cattle have more body capacity than sheep and goats, and resistance should be less of an issue. But since Ivermectin is the only available dewormer to legally use at this time, resistance by the worms has to be considered as a possible occurrence over time.

Keep in mind that Ivermectin will kill the dung beetle larvae, although for a short period of time. Manure from animals treated with Ivermectin is slower to degrade.

Conclusion

There are a number of steps to take when evaluating the impact of parasites on your farm and then determining a management plan.

- Determine if parasites are problem
- Fecal egg counts
- Overall physical condition
- Body condition scores
- Change location of calves
- Keep area dry and clean
- Divide pastures to rest more
- 6 months between calf crops
- Don't graze older cattle with calves
- Rotate pastures
- Observe manure degrading soil organisms
- Plant forages with deworming activity

Try herbal dewormers

It is essential to first determine if parasites are

actually your problem. Fecal egg counts, physical and body condition and nutritional status will help you decide. Second, figure out if something simple like changing the location of calves will eliminate the problem. If changing the location is impossible, such as in a barn, make sure that the area is as dry and clean as possible. If a pasture is grazed and can't be rested for at least 6 months, divide it in half so that half can rest for a longer period of time. Keep older cattle off the pastures used for calves. Divide calves into smaller age groups and don't mix the groups until they are over five months of age. Rotate pastures as much as possible. Observe the presence of dung beetles and earthworms which degrade manure. Notice how quickly manure disappears from pasture. Explore the possibility of planting some of the listed plants as a way of decreasing the number of eggs and larvae contaminating the pasture. Lastly, try some of the herbal dewormers available.

There is still a great need for more research in the areas of forage plants and herbal deworming products. If herbal pastures can be developed that are effective in keeping pasture contamination and parasite numbers to a manageable level, this would be an effective and more applicable deworming strategy. The herbal deworming products are often dry material, require weekly or even daily treatments, and can difficult to administer if animals are all fed together. If farmers try any of these products, they need to keep careful records to ensure that credit goes to the correct thing. As one farmer told, his calf disease problems went away when he just increased the tender loving care he was giving his calves. Many producers unconsciously change their management when they start using a different product, yet still give the credit to the product.

Ann is a veterinarian with 15 years experience in organic livestock production. She has her own consulting business working with producers and educators across the country on sustainable animal health management. She feels strongly that the health of the animal is tied to healthy soils/plants and that decreasing stress is important in enhancing health. She believes that controlled grazing is the best way to achieve healthy animals. Contact Ann Wells, DVM, Springpond Holistic Animal Health, Prairie Grove, AR, 479-846-5794, annw@pgtc.com

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