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MUCH ADO ABOUT WORMS!

. . . internal parasite control on an organic farm

What is a Parasite?

Any organism that lives at the expense of another is a parasite. While we can think of many examples of that in human society, in animals, internal parasites include several types of 'worms' - nematodes, roundworms, flukes, tapeworms and flatworms. All species of animals, including humans, are susceptible to internal parasites. In wild animals, internal parasitism is considered universal and rarely seems to be a problem unless the animal is weakened from other causes. Indeed, some researchers think that a certain internal parasite population is necessary for an animal to maintain a healthy competitive balance and vigorous immune system, and that eliminating a normal mixed parasite population renders the animal vulnerable to other more serious problems.

In domesticated animals, parasitism is also very common, but it can become a serious issue when the delicate host/parasite balance is upset. The amount of damage that parasites can inflict depends on the S-E-N (stress/environment/nutrition) status of the animal. Healthy animals under minimal stress, fed a nutritionally balanced diet, will often be able to keep parasite load in check much easier than weakened animals. Young animals, especially calves and sheep are more susceptible and do require closer attention to careful management, infection avoidance, and periodic treatment.

A comprehensive 'integrated parasite management' strategy seems the best and most effective approach against livestock parasites, BOTH on organic farms with limited treatment tools, but also on conventional farms where increasingly, the commercial dewormer medicines are losing their effectiveness as parasites develop resistance and common management practices facilitate re-infection.

Got Parasites?

General symptoms of an elevated parasite load include watery diarrhea, rough hair coat, persistent cough, pot belly, swelling under the jaw "bottle jaw", general unthriftiness, impaired immune function, anemia, and reduced weight gain. Opportunistic infections, such as pinkeye and scours, will be more prevalent. Adults often develop some immunity to parasites, but in severe cases may show reduced milk production and body condition. Veterinarians can do fecal egg and adult counts for specific parasites. Scientists in South Africa have developed a fairly accurate field test called FAMACHA that correlates sheep parasite load to the color of the inner eyelid, a measurement of anemia. An animal is likely to be anemic if the inner eyelid and conjunctiva are white to pale pink.

INTEGRATED PARASITE MANAGEMENT

Condition of the animal. Stressed and weakened animals will be more susceptible to parasites. Therefore, it is essential to minimize stress due to weather, inadequate nutrition, mycotoxins in feed/forage, stray voltage, poor water, other diseases, medication, crowding, overproduction etc. Learn how to identify stressed animals and to identify likely causes. Routinely keeping a 'stress score card' can help pinpoint changes and individual animal that show elevated levels of stress. In general, the best formula for healthy, low-stress livestock that require minimal intervention is always = dry bedding + fresh air + sunshine + well managed pastures + appropriate shelter + a ration based on highly

nutritious forages with pectin. A calm strong well-nourished healthy animal with a healthy competitive gut is your best defense against parasite problems.

Nutrition is a key factor in an animal's ability to resist parasites. When an animal is fed an inadequate ration, or is deficient in certain vitamins and minerals (especially copper, cobalt, iron and vitamins A, D, and B), their resistance to internal parasites is decreased. Naturally, if the soil is deficient in these minerals, so also will be the crops grown on that land, as will the animals. Probably the first step in long-term parasite control is to take soil tests to determine the soil amendments are needed to correct deficiencies. This long-term approach should be combined with a good balanced feeding program to correct current issues. Providing a free-choice 'cafeteria' mineral feeder with several different minerals will help animals adjust their intake to meet their individual needs.

Sanitation and Pasture/Facility Management. Pastures must be managed carefully to avoid parasite buildup. The density of animal stocking and the length of time between pasture rotations strongly affect the parasite load. Where there is a parasite problem, a 3-6 month pasture rest interval is recommended during the grazing season. This can be difficult, especially on farms with limited land. Parasite worms move around more in a pasture when grass is wet, climbing to the tips of leaves where they are easily ingested. Limiting grazing during wet periods may be necessary, especially for young animals. Improving pasture drainage and mowing the pasture during the summer will increase drying, and will spread out manure piles for more rapid breakdown. Co-grazing with poultry and other species that don't share the same parasites will also hasten the manure breakdown and the birds will eat many of the worms.

Many parasites complete a portion of their lifecycle outside the primary host animal. The liver-fluke completes its lifecycle in small snails that are eaten by animals grazing wet grass. Clipping tall pastures will reduce moisture near the soil, thereby reducing the number of snails. Rotating animals out of pastures before they eat the bottom 4" of grass will also reduce exposure. Avoid overgrazing a paddock, especially in damp weather, since overgrazing tends to force cows to eat "below the snail line" and on areas where manure has been dropped. Fencing farm ponds and wet boggy areas is important to prevent animals from drinking contaminated water and being in snail-infested areas.

Because calves are particularly susceptible, it is a good idea to avoid grazing calves where mature cows have grazed within the past 6-12 months. Protection of bunks, mangers, and water supplies from manure is essential. Identify and correct situations where even small amounts of manure from a parasite-ridden animal can get to the mouth of another animal. If there was a parasite problem with calves the previous year, it would be best not to graze calves in the same location, especially in the early spring when the grass is damp. Rotate calf hutch location so young calves aren't immediately exposed to the parasites from the last round of calves. In the barn, keep calves clean, dry, well bedded, and separated from older animals. Relying on pasture to supply most of the nutritional needs of young calves actually increases their exposure to internal parasites at a very susceptible age, potentially overwhelming their underdeveloped level of immunity. Giving calves some dry hay and grain will discourage over-vigorous grazing. Weaning calves too young and feeding them poorer quality hay, pasture and feed will predispose them to parasite infection.

Deliberate planting of certain pasture plant species that are high in condensed tannins (birdsfoot trefoil, sericea lespedeza, sainfoin, white clover, purple field peas), that control nematodes (mustard, forage brassica, wormwood, turnip, horseradish, marigold and sudangrass) and that enhance animal immune functioning (garlic) can help the animals 'self-medicate' to keep parasite load under control. Since parasite infection peaks in the spring, when grass is damp and grass consumption is most enthusiastic,

it might make sense to deliberately plant a spring/early summer pasture of high-tannin species to treat the animals before new infection gets established.

There is some evidence that copper deficiency predisposes animals to increased parasite problems. Because copper can also be toxic, it is important to supplement carefully with a high-quality balanced mixed mineral that contains adequate levels of copper. In sheep, additional dietary protein and kelp around lambing has been shown to counteract the usual reduction in parasite resistance that the stress of lambing often induces.

Organically approved parasiticides generally work as irritants - they irritate the worm itself or the animal's gut, causing the worms to detach and be expelled. These products only minimally kill the parasites - they primarily just 'clean house'. Unlike when chemical dewormers are used, live adults and eggs will be present in the manure of treated animals on organic farms. Since organically approved products have little residual effect, re-infection and spread through ingesting manure is quite likely both in treated and untreated animals unless improved sanitation and strategic management changes are implemented to reduce this possibility.

Ivermectin has been shown to kill dung beetles, which are so important to rapid manure breakdown in the pasture, so even though it is technically allowed on organic farms with certain restrictions, it is not a great choice except in emergencies. If you use a dewormer, do so before you move the animals to fresh clean pasture so that the majority of the infested manure is dropped in the old pasture.

Plant Based (Botanical) Treatments - there are many botanical (plant-based) and mineral products that have been used as parasiticides. These mostly seem to cause a 'gut spasm', irritating the gut lining astringently and causing the worms to be expelled. Other mineral products such as Ferro work much the same way, while supplementing the animal with iron and other minerals often deficient in a heavily parasitized animal. Please note that some of these materials have not been well evaluated for either efficacy or safety, and are not on the official AAFCO list of allowed feed ingredients and may not technically be legal to feed to livestock.

Garlic - garlic works best as a preventative treatment and helps improve immune system functioning. Fresh unprocessed garlic is best, grated or crushed, and can be mixed with honey or molasses and flour. When treating milking cows, feed the garlic immediately after milking to avoid the milk taking on a garlic flavor. A garlic/cider vinegar drench has been also been used successfully, as has the commercially available Garlic Barrier liquid. Garlic is AAFCO approved.

Black Walnut Hulls - powdered dried black walnut hulls are high in tannins. They have long been used as an economical dewormer. Recommended feeding rates are 1 tsp per calf per day for 7 days.

Neem - both oil pressed from the seed, and teas and tinctures made from the leaves of the Neem tree have been traditionally used in India and Asia for parasite and insect control.

Wormwood - Various species of Artemisia have been used for many years as wormers and are quite effective, though they can be fairly toxic if used regularly or excessively, especially if wormwood oil is used. Wormwood grows wild in North America and could be a useful species to establish in a pasture. One recommended wormwood preparation involves mixing powdered wormwood, cayenne pepper, honey and flour!

Goosefoot (Chenopodium ambrosioides) is also widely used as a wormer, but can be quite toxic and must be used with restraint. Goosefoot is also known as wormseed or by its Spanish name, 'epazote'.

At one time, goosefoot was a commercial crop in Maryland, grown to produce a treatment for intestinal worms in American children and pets.

Pumpkins - November 1 is a great day to deworm calves, with all the cheap pumpkins that did not sell on Halloween! Pumpkins and other cucurbits contain a chemical called cucurbitacin that can be an effective dewormer. An extracted tea from crushed pumpkin seeds seems more effective than feeding whole seeds or fruit.

Does Diatomaceous Earth Help? DE is derived from fossilized diatoms, a type of marine algae. DE theoretically acts as tiny pieces of glass, scrubbing out the intestine. Though widely used by organic farmers, and despite much popular "wisdom", numerous studies have shown that DE is NOT effective against parasites, especially if there is a substantial population. It seems that farmers who claim DE success are probably also doing an excellent job of management - very likely the success they credit to the DE, they should be crediting to themselves! As a preventative treatment, DE may help, but be aware that DE can tie up certain mineral nutrients, such as phosphorus and magnesium. DE is quite irritating, both animal and farmer should avoid breathing the dust.

Organically Approved Parasiticides - The AgriDynamics products, Vermitox and Neematox, are classic and effective blends of plant tannins, neem oil, plant oils, extracts and tinctures, and nutritionally critical minerals. Crystal Creek Pivot FL is a mixture of yeast cultures, ginger, yucca and other botanicals. Based on field observation, both are effective in lowering parasite load, but getting an animal effectively 'cleaned out' probably will require multiple doses of these products, often on 5-21 sequential days, and should be combined with improved management to prevent re-infection.

Homeopathic preparations - there are various homeopathic remedies that appear to be somewhat effective as preventatives or when the parasite load is low. Recent studies out of England show a significant reduction in fecal egg count after treatment with a homeopathic deworming preparation.

Parasiticides and Organic Certification - NOP Standard 205.235 (2)(iii) says that "Once an entire, distinct herd has been converted to organic production, all dairy animals shall be under organic management from the last third of gestation" which implies that even calves should not receive prohibited materials. However, the NOP Standard 205.238(2) also says that "Allowed parasiticides (Ivermectin) may be used on: Dairy stock, when used a minimum of 90 days prior to the production of milk or milk products that are to be sold, labeled, or represented as organic." Therefore, a dairy farmer can use ivermectin on an emergency (non-routine) basis if they document the parasite need, and also document the 90 day milk withholding period.

An animal that receives a synthetic parasiticide at any point in its life from the last third of gestation on can NEVER qualify for certified organic slaughterstock. Therefore, if organic dairy farmers ever want to sell some of their animals for meat, they must be very aware of how dairy and slaughterstock standards differ and be able to clearly identify those animals that do not qualify for meat production.

The NOP standards also are quite explicit that it is prohibited to withhold medical treatment from a sick animal in an effort to preserve organic status. All appropriate medications must be used to restore an animal to health when methods acceptable to organic production fail. Therefore, if an animal is heavily parasitized and needs stronger conventional treatments, the organic farmer is obligated to treat the animal and then sell it as conventional

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