

# “0-3-6-9” Strategic Parasite Control In Goats

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## Internal Parasitism in Goats:

Internal parasites often cause severe problems in goats especially when goats are forced to graze intensively. As with cattle, parasitism in goats causes considerable economic loss in production by interfering with the health and well being of the animals. Parasites have been shown to adversely affect milk production, reduce breeding efficiency, reduce weight gains, decrease hair quality, etc., but unlike cattle, it's not uncommon to find goats of all ages, which succumb to heavy parasitism, if not treated.

Goats are affected by many different parasites but probably the most important parasite of goats lives in the abomasum (4<sup>th</sup> stomach) and is called *Haemonchus* (barberpole worm). This parasite is not only the most prevalent parasite in goats but also is the hardest to control since it has a time during its development that the developing larvae undergo inhibition or become arrested in a larval stage that is refractory to most dewormers.

## **Goats develop high levels of parasitic worm burdens for a number of reasons:**

1. By nature, goats are browsers eating leaves from trees and brush, but when placed on pasture or put in a situation where overcrowding exists, goats will become heavily infected with parasites. Since goats historically over the past several thousand years have not been forced to graze intensively, as a species, they seem to be less adapted to parasites than sheep or cattle and thus are more susceptible to the ill effects from internal parasites when placed in an intensive grazing situation. It is not uncommon even for a small goatherd to lose several animals a year to parasitism.
  2. Goats graze closer to the ground than cattle where parasitic larvae are often concentrated. Parasitic larvae hatch from eggs passed in the fecal material; these larvae undergo several molts until they reach an infective stage. This infective stage is mobile and moves with moisture trails onto nearby vegetation to be eaten
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by its intended host. Parasitic larvae can build up to very high numbers on summer pasture as the animals constantly re-infect themselves.

3. Fecal material excreted by goats is very concentrated and, therefore, worm egg counts can be very high. Fecal worm egg counts from goats can be 5 to 20 times greater than similar counts found in cattle. A small amount of goat's feces, therefore, can produce a high level of parasite contamination.
4. Parasite control programs for goats over the years have been more therapeutic than preventative. Treating goats after heavy parasite loads are encountered has little impact on reducing future contamination of the environment. Furthermore, once high worm burdens are encountered, complete control is hard to achieve and often heavily infected goats continue to shed worm eggs even after treatment.
5. A commonly recommended practice over the years has been to deworm goats every eight weeks while on pasture. Since the life cycle of parasites in goats is approximately three weeks or less depending upon the type of parasite present, this practice has allowed goats to be clean for three weeks, then wormy for five weeks, clean for three weeks, wormy for five weeks, etc. For an efficient parasite control strategy to work in goats, parasite challenge needs to be significantly reduced early in the grazing season otherwise high burdens will develop as the season progresses.

### **Diagnosis of Parasitism in Goats:**

The easiest method to find the presence of this parasite is through a fecal check since *Haemonchus* is a prolific egg layer it can easily be detected on a fecal float. Since high egg counts are frequently encountered, nearly all types of fecal examinations are reliable. The Modified Wisconsin Sugar Flootation Method is a very sensitive method but only one fecal pellet should be used. Too much fecal material makes the slide hard to read because of the amount of fine material that floats up with the worm eggs. If the samples are consistently hard to read, the fecal material can be mixed in water first and centrifuged to get rid of the fine material before the sample is mixed in the sugar solution.

### **The Inhibition of *Haemonchus*:**

High worm burdens most often occur in grazing goats approximately eight to twelve weeks after the beginning of the grazing season. This usually occurs in mid-spring to early-summer under southern climatic conditions and in mid-summer to early-fall under northern climatic conditions. When high worm burdens begin to build within the animal, the physiology of the gastrointestinal tract changes due to large numbers of larvae in the gastric glands shutting down the glands. This change, especially the decreased acid content and an increase in the pH levels of the abomasum (4<sup>th</sup> stomach), causes parasite development to slow and newly ingested larvae in the gastrointestinal wall and

gastric glands begin to inhibit or become arrested as an early 4<sup>th</sup> stage larvae. These arrested larvae may stay in the gastric glands for up to six months.

Once larvae become inhibited, they are very difficult to eliminate or remove to by conventional deworming. Thousands of these larvae can become inhibited and require repeated dewormings just to keep the animals alive. It is often thought that some of the “parasite resistance” to drug treatment is noted incorrectly because many of the dewormers used for goats have reduced efficacy against inhibited parasites. The removal of the adult worms triggers the development of inhibited larvae in the glands so that within a few hours these larvae develop into egg laying adult worms. A positive fecal following treatment is identified with “resistant” parasite but instead in most cases it is the development of inhibited parasites that are responsible for the continued egg shedding.

### **Strategic Parasite Control:**

Prevention is the best method of controlling these parasites in the goat. Repeated strategic dewormings in the spring is necessary to prevent high levels of parasitism from building up on the pastures and in the animals themselves. Strategic deworming is designed to prevent parasite build-up on the pastures creating “parasite safe grazing” through repeated dewormings given to prevention pasture contamination during the first 60 to 90 days of the grazing season.

### **Successful parasite control should include several key goals:**

- 1). The doe should be free of parasites at kidding time.
- 2). Goats should be as free as possible of parasites during periods of low or reduced nutrition such as during the wintertime.
- 3). If the recontamination of spring pastures can be eliminated or greatly reduced for the first three months of the grazing season through repeated therapeutic dewormings given at three week intervals (“0-3-6-9” Strategic Program), parasite safe grazing can be established for the rest of the year.

A late fall deworming (given after the first of November or after the first heavy frost) will reduce the chance of winter parasitism. Depending on location in the country, this treatment should also help ensure that the does are clean at the time of kidding. If it is determined that the doe is not clean at kidding time, the doe should be retreated just prior to kidding.

The next phase of strategic deworming is to instigate a spring deworming schedule to eliminated worm egg shedding during the first three months of grazing. Since the life cycle of gastrointestinal parasites is 18-21 days from the time the animal ingests the infective

larvae until an egg laying adult parasite is present in the animal, the treatment interval should be no more than 21-days.

The treatment clock starts ticking as soon as grass growth begins in the spring. To make the program work, all animals need to be free of parasites at the beginning of the season. Depending upon location in the country, the animals treated in the fall or at kidding should still be parasite-free and not need the initial treatment at the beginning of the spring. If winter grazing takes place, the animals should be checked in the spring, if positive, all animals should be treated prior to spring grazing.

**“0-3-6-9” Strategic Deworming Program:** Once grazing starts, all goats grazing the same pasture should be dewormed every three weeks for a minimum of three to four times beginning three weeks after the start of spring grazing. This program works because the parasitic larvae that survived the winter and are present on the pasture in early spring, die off naturally if they're not eaten by the animals grazing the pasture during the first three months of grazing. If a pasture is left idle, for example, and if animals are not allowed on the pasture until July, nearly all the infective larvae present on the pasture in early spring will be gone from the natural die off and the pasture will be relatively safe from parasites after this time period. The reason that strategic deworming works is that the repeated dewormings keep the pastures from being recontaminated while the natural die off of infective larvae occurs.

Therefore, the key to the success of strategic deworming is that if the animals grazing spring pastures can be prevented from shedding additional worm eggs on the pasture during the first three months of the season, parasite safe grazing can be maintained and parasite burden developing in the animals over the summer grazing season can be significantly reduced.

A treatment example at a given location would be, for example, if grazing starts around the first of April, the first spring treatment would be given around the third week April, followed by a second deworming given in the middle of May followed by a third treatment given the first week of June, leaving the animals free from shedding parasitic worm eggs until approximately the first week of July.

Strategic deworming works at the beginning of the grazing season by timing the treatment to kill the parasites after the infection process has begun in the animal but before the parasites have developed sufficiently to become adults and begin to lay worm eggs, which pass back on the pasture. **The animals, therefore, work like vacuum cleaners eating the parasitic larvae present on the herbage reducing pasture contamination while the 0-3-6-9 strategic timed treatments prevents further re-contamination of the pastures thus providing “parasite safe pastures” for the entire grazing season.**

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