

# 2005 Hair Sheep Workshop @ Virginia State University

## Contributions of Hair Sheep to Control Parasitism

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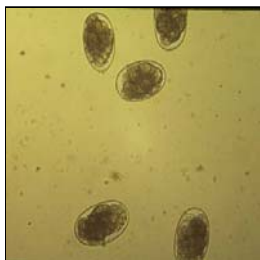
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**Barber pole worm**



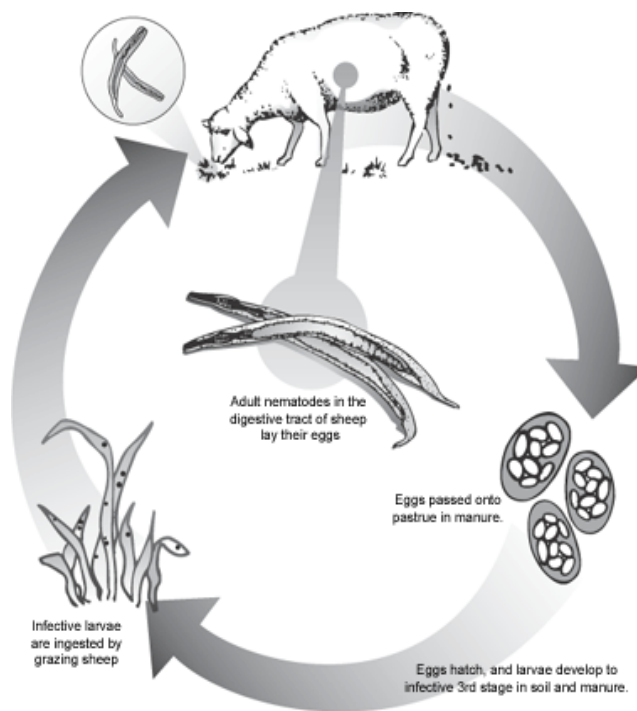
Parasitic nematodes in the gastrointestinal tract of sheep and goats are a problem for small ruminant producers in the U.S., especially in the Southeast. Although several nematode species live in the abomasum and intestines of small ruminants, *Haemonchus contortus* (known as wireworm or barber pole worm) is the most important in the eastern and Midwestern regions of the U.S.

The clinical effects of barber pole worm infection are especially severe because this parasite feeds on the blood of the host and can cause anemia and even death of sheep and goats. Barber pole

worm and other related nematode parasites have become difficult to control for many producers because the intensive use of deworming drugs over the past 25 years has led to widespread drug resistance in barber pole worm populations. This situation is especially serious because no new dewormers will be marketed in the near future.

Increasing drug resistance in barber pole and similar worms has made effective parasite control for producers increasingly challenging and is most effective when an integrated program can be developed. In order to attack the parasite on different levels producers need to understand the parasite life cycle.

Adult worms in the stomach and intestines produce eggs that are passed in the manure. Larvae develop in the eggs, hatch out and then spend a period of time developing to the infective stage. The length of time required to reach the third larval stage capable of infecting a sheep or goat depends on the weather. The warmer the weather, the less time it takes. In summer, infective larvae can form in as little as 1 to 2



### Control of Internal Parasites in Sheep

Source: Virginia Cooperative Extension.

<http://www.ext.vt.edu/pubs/sheep/410-027/410-027.html>

weeks. Small ruminants are infected during grazing when they eat larvae that are on the grass. Development of larvae into adult worms that can produce eggs takes about 3 weeks in the host animal. The important point to remember is that the climate really controls how fast worm problems develop because it controls the speed of development of infective larvae.

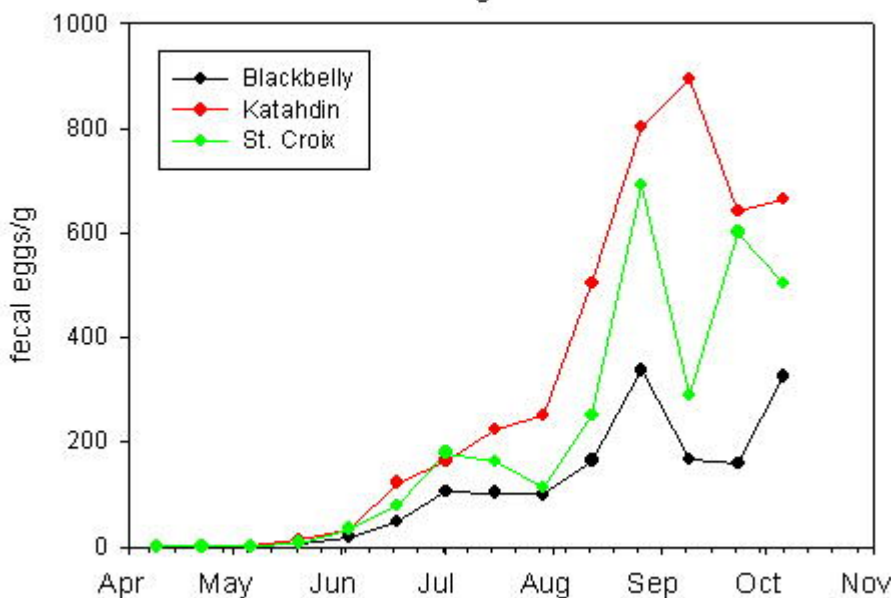
Because of increasing drug resistance in barber pole worm, other techniques of parasite control are receiving more attention. One of these alternatives is the use of sheep or goats with increased resistance to parasites. Animals with greater resistance to infection reduce the dependence on deworming treatments because they have lower parasite numbers and are less likely to develop parasitic disease than susceptible sheep.

Resistance to barber pole worm and related nematodes varies both within breeds and between breeds of sheep. While factors like nutritional status and level of parasite exposure have an effect on an animal's "worminess", we also know that a large component of resistance to parasites is inherited in the same way that many production characteristics can be influenced by heredity.

Breed	Fecal egg count (eggs per gram)	Packed cell volume	No. of dewormings	% animals dewormed
Suffolk	3,577	22.9	113	90.3
Gulf Coast Native	1,639	29.0	20	25.5
Katahdin	1,435	26.0	41	52.8
St. Croix	866	27.0	12	16.8

A number of studies conducted in several countries have shown that some hair sheep breeds consistently show increased resistance to parasites compared to common wool breeds. In Kenya, Red Masai sheep show high levels of parasite resistance, as do Santa Inês sheep in Brazil. In the U.S., Barbados Blackbelly and St. Croix sheep show increased parasite resistance. These breeds were originally imported into the U.S. in small numbers from the West Indies. South African Dorper sheep have not consistently shown increased parasite resistance. Parasite resistant hair sheep breeds have lower numbers of adult worms and shed fewer parasite eggs in the manure than susceptible breeds. This increased resistance that limits parasite numbers is different from what is called "tolerance" to parasites. Sheep that are more tolerant to parasites can be infected with the same number of worms as other sheep but will not be as seriously affected by the parasites.

Figure 1



Another hair sheep breed that is increasing in popularity in the U.S. is the Katahdin. This breed was created through crosses of several breeds, including St. Croix. Because of the St. Croix ancestry in the Katahdin, it was expected that this breed might also have some increased resistance to parasites. Studies conducted with several Katahdin flocks in Louisiana (Table 1), Arkansas and Virginia (Figure 1) indicate that Katahdin sheep are more parasite resistant than fully susceptible wool breeds, but are not as resistant as the U.S St. Croix breed.

## **Why are some sheep breeds more resistant to parasites than others?**

The increased resistance to infection is thought to be the result of a more effective immune response to the parasites, although the exact mechanism of the resistance is not known. Even within parasite resistant breeds there is variation in the amount of resistance shown by individual sheep. The relative amount of resistance shown by individuals can be evaluated by counting the number of parasite eggs in fecal samples. Experiments are also being conducted at several universities to identify genes linked to resistance so that individual sheep can be evaluated for their ability to resist nematode infection.

### **Conclusion**

Parasite-resistant hair sheep require less intensive management for parasite control than many wool breeds. This is an advantage in low input and organic sheep production systems. Hair sheep can also increase parasite resistance in lambs when used in cross breeding programs.