

## INTERNAL PARASITES OF SHEEP AND GOATS



These diseases are known to occur in Afghanistan.



### 1. Definition

Parasitism and gastrointestinal nematode parasitism in particular, is arguably the most serious constraint affecting sheep and goat production in Afghanistan. Economic losses are caused by decreased production, cost of prevention, cost of treatment, and the death of infected animals.

### 2. Etiology

Although there are a number of worms found in sheep and goats, the predominant and usually the most pathogenic ones are gastrointestinal nematodes (worms). Amongst them, *Haemonchus contortus* (Barberpole Worm, Wire Worm) is a voracious blood feeding worm. These worms thrive under hot and moist environmental conditions.

*Teladorsagia (Ostertagia) circumcincta* (Brown Stomach Worm) feed mostly on nutrients in mucous and do not feed on blood. This worm thrives in cooler wet environmental condition.

*Trichostrongylus colubriformis* (Bankrupt worm) seems to thrive better under more cool and wet conditions feeding on nutrients in mucous and interferes with digestive function resulting in diarrhea. It is called the bankrupt worm because death is seldom the end result and animals just become poor doers leading to loss of production and income.

*Oesophagostomum* spp. (Nodular worm) resides in the large intestine

feeding on blood and can contribute to the overall anemia being caused by *H. contortus*.

*Trichuris* spp. (Whipworm) are usually found in small numbers and are also blood feeders contributing to the overall blood loss due to other worms.

*Moniezia* (Tapeworm, white rice grain-like "worms") absorb nutrients from digested feed and cause very little damage. However, growth in kids (not adults) may be somewhat reduced and intestinal blockage may rarely occur.

*Fasciola hepatica* (Liver fluke) can be a major problem in low lying perennial wet areas in Afghanistan. Liver flukes reside in and damage the liver resulting in unthriftiness, weight loss/reduced gains, and sometimes death.

*Dictyocaulus filaria*, *Muellerius*, *Protostrongylus* (Lungworms) infection result in respiratory distress (chronic coughing), unthriftiness, and sometimes death.

*Eimeria* spp. (Coccidia) is a disease associated with filth, moisture and times of depressed immunity such as kidding, weaning or during transportation. Infection results in destruction of the intestinal lining leading to scours, unthriftiness, weight loss/reduced weight gains, and sometimes death.

### **3. Transmission**

The worm life cycle consists of part of their life being spent inside the animal and part of their life on the pasture. Worms mate in the host and females lay eggs that pass out in the feces. The eggs hatch and develop to infective young worms (larvae) while remaining in the feces. The infective larvae then move out of the feces onto the surrounding forage

where they can be consumed during grazing thus completing the cycle. Spring is the most dangerous time for animals to become infected with worms. In the summer when it is hot, parasite eggs and larvae may not survive so well on pasture. However, there may be another high risk of the disease in autumn, when temperatures begin to fall and the young worms once again can survive on pastures until the cold temperature of winter arrive. Transmission of parasites can be reduced by implementing control measures to eliminate the worms from the animal (deworming) and/or reducing the chances that infective larvae have to re-infect the animal (management). Transmission of liver flukes ceases in late spring/early summer.

#### **4. Species affected**

Young lambs and kids are very susceptible to the effect of worms, and often become sick and die. Adult sheep and goats are also susceptible.

#### **5. Clinical signs**

Animals affected by parasites show many signs of infection depending on the parasites present. The general signs include rough hair coat, diarrhea, thriftiness, depression, weight loss (or reduced weight gain), bottle jaw and anorexia (off feed).

*H. contortus* infected animals show symptoms associated with blood loss (anemia), which include pale mucous membranes (most visible by viewing inside the lower eyelid) and bottle jaw (an accumulation of fluid under the chin). The greater the infection level the more blood is lost and eventually the animal may die. When infections with *Teladorsagia* (*Ostertagia*) *circumcincta* and *Trichostrongylus colubriformis* reach levels that cause disease to be seen, the primary symptom is diarrhea.

## **6. Pathologic findings**

Dead animals should be opened and inspected for worms in the intestines, stomach and liver. Some worms could be seen with naked eye attached to the lining or squeezed out of the organ.

## **7. Diagnosis**

Laboratory diagnostic findings may include anemia (low PCV), increased fecal egg count (FEC) and loss of plasma protein. Level of anemia can be roughly evaluated by observing the color of mucous membranes of the lower eye lids.

The FAMACHA eye color chart system was developed in South Africa to help producers monitor and evaluate level of anemia without having to rely on laboratory testing. In this method, the lower eyelid mucous membranes are examined and compared to a laminated color chart bearing pictures of sheep eyes at 5 different levels of anemia.: 1 (red, non-anemic); 2 (red-pink, non-anemic); 3 (pink, mild-anemic); 4 (pink-white, anemic); 5 (white, severely anemic). Since anemia is the primary pathologic effect from infection with *H. contortus*, this system can be an effective tool for identifying those animals that require treatment (but only for *H. contortus*).

## **8. Treatment**

Dewormers (anthelmintics) are available in various formulation and variety of forms for administration by drenching, pill, injection or incorporation in feed and water. Treatment schedules vary between regions and with different species of parasites. The most important aspect of using dewormers is to conserve their effectiveness. This can be achieved by using them as little as possible and only when infection levels dictate that intervention is necessary. It would be prudent to establish which dewormers are effective against a worm population. This can be achieved by conducting FEC reduction testing and should be done by a qualified professional such as a veterinarian, veterinary school parasitology lab or a diagnostic lab that

offers such a service. Animals should be dewormed based on need using FAMACHA and Smart Drenching approach, or strategic deworming during favorable conditions for the parasite, especially in the spring and autumn and around the time of kidding and lambing.

### **9. Prevention and control**

The major problem encountered in controlling nematode parasitism in sheep and goats is the resistance that many worm populations (specifically *H. contortus*) have developed to essentially all of our dewormers. Resistance has developed primarily because dewormers have been used and rotated too frequently and many times under-dosing occurs. Effective worm control and treatment can not always be achieved by drugs alone. Anthelmintics should be combined with other methods such as rotational grazing and elimination of host species.

(photos, next page)



Bottle jaw -  
accumulation of fluid  
under the chin.



FAMACHA© eye  
color chart being  
used to check level  
of anemia.



Adult lungworms in  
the bronchi of the  
lungs.