

Coccidiosis important in kids

All goats probably get infected with coccidia at some stage of their life, but fortunately only a small percentage of them actually become ill. Even so, coccidiosis is one of the most important diseases of kids and can be responsible for diarrhoea, weight loss and even death.

At least nine different species of *Eimeria* (a small protozoan parasite) can cause coccidiosis in goats, but some cause much more damage than others. All are specific for goats except for one (*Eimeria caprovina*) which apparently can also infect sheep.

Goats become infected when they eat food contaminated with coccidial oocysts, a relatively resistant stage of the parasite which is passed in the faeces of infected animals. Once in the gut the oocysts release their contents and a complex sequence of asexual and sexual reproduction within intestinal epithelial cells leads to the formation of new oocysts which are shed in the faeces 2-4 weeks after the initial infection.

Each oocyst ingested can result in millions of new oocysts being produced. Because of this massive amplification within an animal the environment can become heavily contaminated with oocysts in a short time, particularly when conditions are warm and moist.

Adult goats develop a strong resistance to coccidial infection, but kids are highly susceptible and play a major role in increasing the level of infection in their environment. Not surprisingly, coccidiosis is most common in intensively reared kids, usually around the time of weaning. Late kids are especially at risk because they will have to face an environment already heavily contaminated with oocysts.

The disease can also occur in adult goats whose immune system has been suppressed by the stress of transport or shearing.

A recent study in Australia suggests that goats older than 7 years of age partly lose their resistance to coccidial infection and shed increased numbers of oocysts in their faeces.

Scouring, weight loss

The most obvious signs of coccidiosis are scouring (occasionally with blood in the faeces) and weight loss. In milder cases there may just be loss of pellet formation and reduced growth rate; changes that could easily be missed. In fact, subclinical coccidiosis probably accounts for significant production loss on many properties. Kids may be suffering from the effects of coccidiosis even in the absence of scouring.

Diagnosis difficult

Diagnosis is not easy because clinically normal goats often shed coccidial oocyst.

Furthermore, there may be considerable intestinal damage and scouring even before oocysts appear in the faeces. Faecal oocyst counts on about 10 kids in a mob may however provide a useful indication of the level of infection.

Other diseases such as worms, yersiniosis (bacterial enteritis) and certain trace element deficiencies can all cause similar signs in young kids and must be differentiated from coccidiosis.

Postmortem examination is the best means of confirming the diagnosis, providing it is performed within a couple of hours of death. The intestines may be slightly reddened and full of fluid, but the most characteristic feature of coccidial infection is the presence of multiple small pale nodules 1-2 mm in diameter in the intestinal wall. These nodules consist of massive numbers of coccidia maturing within intestinal epithelial cells and indicate that infection is present, but they can also be found incidentally in goats which die of other diseases. Microscopic examination of the intestine is required in order to determine how much damage has occurred, particularly in the areas between the white nodules.

Treatment of clinical cases

Sulpha drugs are commonly used for treating coccidiosis in goats and other species, but they only act against certain stages of the parasite and are not always highly effective. Treatment should be continued for 3-4 days but overdosing of dehydrated kids with sulpha drugs can cause kidney failure, so make sure plenty of clean water is available.

Amprolium has also been used for the treatment and prevention of coccidiosis but this drug is a thiamine antagonist and long term therapy can predispose to polioencephalomalacia.

The best news for coccidiosis control is availability of a new drug, toltrazuril ("Baycox"), which is highly effective against all intracellular stages of coccidia. Results of recent trials evaluating the use of this drug in goats are presented in this issue of "Goat Health and Production".

Recovery slow

By the time kids with coccidiosis start to scour they may already have severe intestinal damage and full recovery may take several weeks. Some severely infected kids may in fact become chronic "poor-doers" due to permanent gut damage. Prevention of coccidiosis should therefore be the aim of all goat farmers.

Infection of goats with coccidia is virtually inevitable but as long as the level of infection is low immunity should develop before significant damage occurs. Oocysts are resistant to most disinfectants but are quickly destroyed

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by drying. Kids should therefore be reared in dry conditions with as much sunlight as possible. Avoid overcrowding and maintain a high level of hygiene.

New drug for coccidiosis

The treatment and control of coccidiosis is a problem facing goat farmers throughout the world. Although several anticoccidial drugs are available most are of limited value in treating goats with coccidiosis. Prevention of the disease requires that these drugs be given either continuously in the feed or water, or in the very early stages of infection. This is because they are only effective against the early developmental stages of coccidia.

A new anticoccidial drug, toltrazuril ("Baycox"), has just been registered in New Zealand for the control of coccidiosis in chickens. This drug is reputed to be effective against all developmental stages of coccidia within the cells of an infected animal. Studies in Norway, which showed that a single dose of toltrazuril was highly effective against coccidial infections in lambs, suggest that this drug might be just what goat farmers and their veterinarians are looking for. With this in mind Dr Phil McKenna at Batchelar Animal Health Laboratory, Palmerston North, recently evaluated the efficiency of toltrazuril against naturally acquired coccidial infections in goats. The results were impressive.

In three separate trials conducted by Dr McKenna, a single oral dose of toltrazuril (20 mg/kg liveweight) produced a rapid and highly significant reduction in the number of oocysts in the faeces of goat kids naturally infected with coccidia. One trial involved thirty 7-12 week old artificially reared Angora kids, many of which were scouring and had high faecal oocyst counts in spite of the inclusion of "Bovatec" (lasalocid) in their meal and milk.

High safety margin

The safety margin for toltrazuril appears to be high. **Although toxicity studies have not been performed on goats**, tenfold overdosing of chickens does not cause any apparent side-effects. Dr McKenna found no adverse reactions to the drug when given at 20mg/kg in trials and all goats appeared to find in palatable.

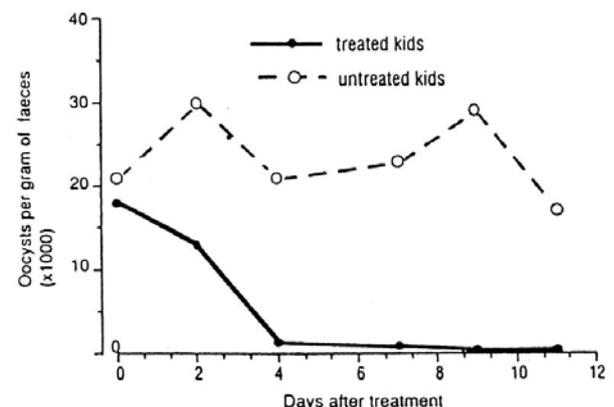
Since toltrazuril residue studies have not been done on goats the drug should not be used on kids which are soon to be slaughtered or on goats whose milk is destined for human consumption.

The other two trials involve Angora-cross wethers transferred from pasture to concrete-floored pens prior to dosing. The results of one of these trials are presented in the graph below. Undosed control goats were included in each trial in order to validate the effect of the drug. Not only did toltrazuril markedly reduce faecal oocysts counts but the counts were still low 2-3 weeks after

dosing. This suggests that the drug successfully killed the developing coccidial stages in the treated kids. Even in the field trial on the artificially-reared kids, faecal oocysts counts only started to rise 4 weeks after dosing, no doubt due to reinfection from the heavily contaminated environment.

Highly effective drug

Although toltrazuril is not registered for use in goats there is no doubt that it is a highly effective anticoccidial drug and should provide significant advantages over currently available drugs in the treatment of clinical coccidiosis. Since it kills all intracellular stages of the parasite a single dose should be sufficient to cure the disease. This does not mean however, that all treated animals will recover immediately since there may have been extensive intestinal damage. Nor does it mean that other measures, such as improved hygiene, can be ignored.



Comparison of coccidial oocysts numbers in the faeces of 5 goat kids treated with toltrazuril ("Baycox") and 5 untreated control kids (courtesy of Dr P.B. McKenna).

Strategic use of toltrazuril also offers an alternative to anticoccidial feed additives in preventing outbreaks of coccidiosis. On properties where the risk is high, dosing of kids at 3-4 weekly intervals might be expected to keep environmental contamination at a low level.

BAYCOS (distributed by Bayer) is now available in Australia from your Vet. It is very expensive but very effective. Dose rate I have used 16ml to 20 kg - The Editor.

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