

YERSINIOSIS: A bloody waste

Some readers may have experienced the heartbreak of finding dead or sick deer calves with a bloody scour during the late autumn-winter period. The most likely cause is yersiniosis.

The disease is similar to salmonellosis in young cattle and in the early stages is characterised by green, watery smelly diarrhoea. This soon becomes bloody and rapidly leads to death if untreated. A post mortem examination reveals inflamed intestines with very bloody contents.

In this article, Dr Colin Mackintosh of Invermay Agricultural Research Station discusses yersiniosis and the progress being made in the development of a vaccine.

WHAT CAUSES yersiniosis? The culprit is a bacterium called *Yersinia pseudotuberculosis* (*Y.pstb*), but the name is misleading. The "pseudotuberculosis" label was given more than 100 years ago to describe the abscesses it causes in rabbits and guinea pigs, similar to those caused by true tuberculosis. However, the organisms are entirely different.

Y. pstb can be carried by birds, rodents, rabbits, dogs, cats as well as domestic livestock including cattle, sheep and goats. In most cases infected animals remain apparently healthy although they excrete the organisms in their faeces. The organism is vulnerable to drying and warm conditions and so it does not survive well in the environment under dry sunny summer conditions. However, in winter — especially in cold, wet, overcast conditions — it can survive well in soil, water and on pasture.

Stress and the disease

Because the organism is shed by a number of animals it is inevitable that it will be present in most farming

environments in winter and that fawns or calves will be exposed to it. If the fawns are healthy, well-fed and not burdened by parasites or subjected to abnormal stress, then they will usually experience a very mild infection with no outward signs.

However, if they are stressed at the time of infection, then a proportion, (sometimes up to 20 per cent) may develop diarrhoea and will die if left untreated. The common stresses include under-feeding, transport, bad weather, inadequate shelter, social stress or concurrent disease such as heavy lungworm burdens.

Weaning during the winter can also impose stress, especially if feed is short or there is a transition to a new feeding regime, such as from pasture to supplements. Such a stress may be minimised by weaning fawns in autumn before the rut, when conditions are warmer and feed more plentiful. It may also help to keep them under cover and feed them supplements for a few days at weaning to help minimise the stress and protect them from bad weather.

Despite the best efforts, yersiniosis can still strike, especially if a storm occurs unexpectedly. If the fawns are in an exposed paddock they can lose a lot of body heat very quickly. At this age they usually have very low fat reserves (less than 5 per cent of their bodyweight) and their coats are not well insulated.

Their natural response is to cease feeding, seek shelter and lie low. If the bad weather continues for any length of time, their lack of eating is compounded by the loss of heat and the intestinal movements tend to slow down.

It is thought that this slowing of intestinal activity can allow the yersinia organisms to multiply excessively and produce toxins which damage the lining of the intestines. This leads to a rapid loss of body fluids, bleeding into the intestine, dehydration and shock, rapidly leading to death. Thus, for successful treatment, speed is essential.

It is therefore vital to call your veterinarian promptly if you see yersinia symptoms in your stock. If

treated early enough, victims will usually respond well to appropriate antibiotics and fluid therapy.

Natural immunity

When fawns experience a mild yersinia infection or recover from the clinical disease they appear to retain a high degree of immunity for life. Clinical yersiniosis is uncommon in adult deer, except in recently captured deer which are under considerable stress and are introduced to the farming environment, where they may be exposed to strains of yersinia which they have not encountered before.

The fact that most animals develop natural immunity to yersiniosis has led to the hope that we can vaccinate young deer prior to their first winter and thus help to prevent losses due to this disease. Work at the Invermay Agricultural Centre, Mosgiel is directed towards developing a dead *Y.pstb* vaccine, two doses of which would be administered to calves four to six weeks apart in March or April.

It is hoped that the vaccine will prevent clinical disease, but it may not prevent mild inapparent infections. In fact, such infections may help the development of long lasting natural immunity.

Developing a vaccine

A number of small-scale vaccine trials have been carried out at Invermay, but the testing of the vaccine has been hampered by the lack of a reliable method of inducing yersiniosis in deer to test the vaccine.

A small field trial was conducted in the winter of 1985 on 30 farms in the Waikato, Hawkes Bay, Canterbury, Otago and Southland areas to see how the vaccine performed against natural challenge. On each farm equal numbers of fawns in mobs of 50 to 100 were vaccinated in the autumn with either the experimental vaccine or a sham vaccine. They were then monitored throughout the winter and post mortem examinations were carried out on any fawns that died, noting which vaccine they had received.

Overall, 2216 fawns were included in ▶

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the trial and 18 deaths were recorded: Ten had received the yersinia vaccine and eight had received the sham vaccine. However, *Y.pstb* was isolated from four sham vaccinated calves and only two yersinia-vaccinated calves and both of these had received only one dose of vaccine before they died. It is possible that these two animals were incubating the disease around the time of vaccination. Other causes of death were pneumonia or lungworm infestation (5), MCF (1), broken neck (2) and undiagnosed (4).

On one farm, one of 30 sham-vaccinated died of yersiniosis while no yersinia vaccinated fawns were affected.

Thus, although the results do not show significant protection, they have encouraged us to continue the work. The trial was hampered by the low incidence of the disease due perhaps to the mild winter and the relatively small number of animals in the trial.

Another trial was planned for 1986, but unfortunately the vaccine became unavailable at the last minute because



To prevent yersiniosis, look after your weaners in their first winter.

it was contaminated during manufacture. It is hoped that a large scale trial will be conducted in winter 1987 involving up to 10 000 fawns.

Take home message

To prevent yersiniosis in fawns or calves in their first winter, feed them well, provide shelter, control

lungworm burdens and minimise stress.

Observe your fawns closely and if you detect any scouring then isolate them immediately and call the vet. Prompt treatment should cure them.

It is hoped that there will be a commercial yersinia vaccine available in a few years.

Final note

Yersiniosis is a zoonosis. In other words, you can catch it from your fawns. If you develop a severe gut-ache, similar to appendicitis, see your doctor and tell him that you have had contact with deer, especially if you have been handling scouring fawns.

A number of people in the United Kingdom and New Zealand with suspected appendicitis have been operated on, only to find the problem was in fact swollen intestinal lymph nodes due to yersinia infection which was subsequently cured by antibiotics. Nevertheless, prevention is better than cure, so make sure you wash your hands and change your clothes after handling scouring weaners. ○