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TECHNICAL INFORMATION FOR TODAY'S FEED PROFESSIONAL

Intestinal Disorders Caused By Protozoa
Part 2

This article is the second in a 2-part series on intestinal disorders in calves caused by protozoa. Two types of protozoa parasitize in the intestinal regions of the calf: Coccidia and cryptosporidia.

COCCIDIOSIS

Coccidiosis is an intestinal disease which is caused by monocellular intestinal parasites and manifests itself in diarrhea. In severe cases of coccidian the feces may contain blood, for which reason the disease is also known as "red dysentery".

Incidence/Pathogen

Coccidiosis occurs in all domestic animals. It is distributed throughout the world, but is found more frequently in warm climatic zones. In our region it occurs mainly in calves where they are kept in covered yards with moist dirt or in barns with constantly wet bedding. Young cattle contract coccidiosis on moist pastures or on pastures with wet feeding/watering points. It occurs mainly in cattle aged 10 weeks to 2 years, but is also seen in younger calves.

The causative organisms of coccidiosis, coccidian, are monocellular protozoa which live and multiply in the intestine of the calf, that is endogenous development (endogenous = within the body). They are excreted as oocysts in the feces and then undergo exogenous development to form "sporozoites" (exogenous = outside the body). For these processes to take place moisture warmth and oxygen are required in the environment of the oocyst. Under favorable environmental conditions, banana-shaped sporozoites from within 1-2 days in the oocyst, which when taken up by a calf or cow may cause an infection. Immature oocysts do not cause the disease. Oocysts may remain infective for more than a year.

Direct sunlight, temperatures above 40 Cº (100º F) or below - 7º C (20º F) and dry conditions will kill them off.

Transmission/Route of Infection

An infection with coccidian can only come about by the ingestion of infective oocysts with the feed or with feces soiled water. If the mature oocysts pass into the intestine of the calf, the outer shell of the ovoid structure is dissolved by the intestinal juice and the sporozoites thus released attack the intestinal mucosa. They multiply in the mucosal cells, at first asexually, and later sexually. After surviving the infection, older calves often harbor coccidian without showing any signs of the infection. They excrete oocysts almost constantly and are thus responsible for the spreading of the disease (especially to younger calves).

The transmission of the disease into herds can be due to the purchase of such coccidian carriers. The outbreak of a coccidial infection is promoted by unaccustomed and unduly heavy stress such as transport, rehousing and change of feed, which lower the resistance of the animals.

Course and Symptoms of the Disease

At first severe diarrhea with pappy to aqueous feces is observed, which subsequently become mucoid with some blood. Diarrhea occurs one or two days after ingestion of the oocysts. It is caused by sporozoites attacking mucosal cells. Sporozoites and the subsequent development stages formed asexually (schizonts, merozoites) invade the epithelial cells from the caecum and the large intestine. The micro- and macrogametes being formed there serve the purpose of sexual reproductions of the coccidia and cause damage to the intestinal mucosa with diarrhea and other visible signs of the disease. The animals become dull, lose weight, with a rough coat and a drawn-in abdomen. In severe cases, the loss of blood leads to pale mucosae (anemia) and the loss of water (diarrhea) to dehydration of the body. The body temperature is not raised, but is frequently reduced (38º C/100º F or below).

The course of the disease depends on the number of oocysts ingested and on the resistance of the animals.

With an acute course of the disease, the extremely weak animals have a staggering gait and tend to lie down all the time. If treatment is not timely, death may follow as early as three infections with viruses and bacteria can influence the progress of the disease unfavorably and can worsen the clinical profile. The intestinal mucosa, already damaged by coccidia, makes it easy for Coli bacteria or salmonellae to penetrate into the mucosal cells and rapidly multiply there. When these pathogens and their toxins pass into the blood stream, they cause blood poisoning (bacteremia, septicemia).

Less susceptible animals do not show pronounced symptoms, particularly if they are kept under extreme hygienic conditions. Such animals develop immunity to infection and can carry and excrete coccidia without contracting the disease themselves (latent infection).

Coccidiosis causes considerable economic damage. The infection may persist in a group of calves or young animals, especially if the signs of the disease are not as clearly pronounced as described above. Feed intake is lower, feed conversion is substantially reduced and the weight loss of some of days later. In particular, secondary the animals can no longer be made up, even after the animal has survived the disease.

Diagnosis
Coccidiosis should be suspected if diarrhea with blood is observed in calves. A parasitological examination of the feces will show if coccidia are present.

The test also serves to differentiate the condition from poisoning which should always be considered if insecticides or detergents against lice or mange mites have been used. The number of oocysts found does not necessarily give an indication of the severity of the disease, since oocysts are excreted irregularly and in batches.

Treatment
Coccidiosis can be treated by giving sulphonamides or amprolium (Merck) via the milk (milk fed calves) or by administering a bolus (weaned calves). An improvement in the symptoms can be observed as early as the 3rd day of treatment.

In addition, depending on the calf's condition, supportive, alleviating and life-preserving measures should be carried out.

Further uptake of coccidial oocysts by the calves can be reduced by hygienic measures: keeping feeding and watering points dry, keeping water troughs clean, dry litter, frequent change of grazing ground and avoiding moist places in the barn and on the pasture.

Prevention
As a preventive measure DECCOX®
(Alpharma) or Bovatec® can be added to the milk replacer or starter feed.

However, an improvement of hygienic conditions in the barn and on the pasture is the basis of all prevention. Fig. 4 summarizes the most important preventative measures in coccidiosis.

Fig. 4.

Barns/hutch

- Keeping drinking troughs free from feces and clean regularly

Pasture

- Reinforce and tighten drinking troughs so they can not overflow; avoid moist feeding and watering places
- Clean water troughs regularly, remove feces
- Change position of movable drinking troughs daily