Cryptosporidiosis: an important concern in calf and heifer management

More than 100 years after the first description of Cryptosporidium parasites by Edward Tyzzer, the treatment and prevention of cryptosporidiosis remains a challenge for scientists.

by Brigitte Duquesne DVM, Global Technical Manager Ruminants, Huvepharma.
www.huvepharma.com

Cryptosporidium has a worldwide distribution and this protozoan is considered the agent of an emerging zoonosis. Because of its substantial economic impact in farms and in preventing the spread of a zoonotic agent, the control of cryptosporidiosis remains a major challenge for a successful 'One Health' response.

WHO estimates that nearly two-thirds of all human pathogens originate from zoonoses, making it important to adopt a global 'One-health approach', involving veterinary and human sectors alike, to control and prevent zoonotic pathogens.

Cryptosporidium may occur in 30-50% of calves on a worldwide scale and, in some countries, it is the most important cause of neonatal diarrhoea in young ruminants. Cryptosporidium is transmitted via the faecal-oral route.

The low infectious dose of directly infective oocysts, prolonged survival in moist environments and resistance to most disinfectants explains the difficulty of eradication when the parasite is established on a farm.

Although cattle should no longer be blamed as the single source of human cryptosporidiosis, more than 90% of human infections are caused by C. hominis and C. parvum and the transmission from cattle to people is nevertheless an important public health concern.

Vet practitioners play a key role in communicating and implementing cryptosporidiosis control on farm: they should inform the livestock owner of the hazards that result from contact with visibly and invisibly infected animals and provide them with the basic knowledge of sanitary measures required to protect animals, people and the environment.

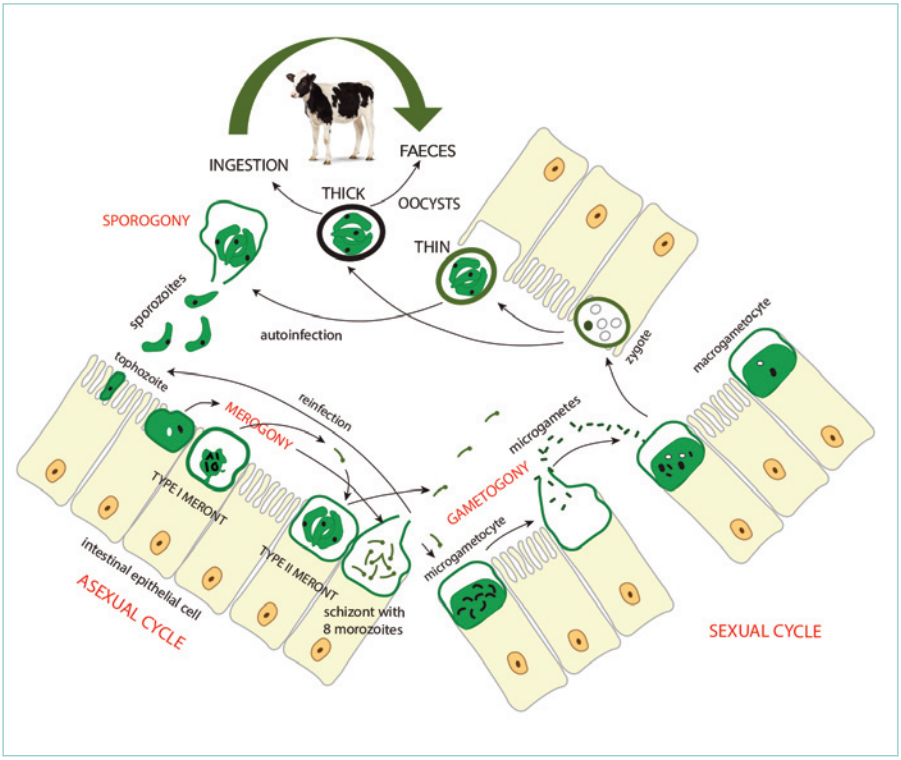

Fig. 1. Life cycle of Cryptosporidium parvum.

Cryptosporidiosis on farms

The history of the farm is important in the diagnosis of cryptosporidiosis, which is often recurrent from year to year.

Even when effective disinfection has been set up, the resistance of oocysts in the environment is such that it is unlikely that there are none in the environment.

The disease generally occurs when the animals are housed and the pressure of infection increases during the calving season.

The first-born calves are quickly infected soon after their birth with environmental oocysts.

The parasites replicate and excrete, multiplying the challenge; the pressure of infection increases during the following births to a 'threshold' – triggering diarrhoea, reaching a peak in the second half of the calving season or beyond, depending on the hygienic conditions and management of operations.

Control of cryptosporidiosis

The general hygiene conditions on the farm, the animal density and the gathering or not of animals into age groups are important factors.

Prevention is essential and is based, firstly, on limiting exposure to oocysts and, secondly, on raising animals' defences.

Minimising transmission

Implementation of biosecurity principles is an essential element in cryptosporidiosis control.

- **Limitation of contaminant entry into the site:**

The introduction of animals poses a major risk to livestock, which implies checking the health status of the buyer's animals and the animal purchased.

Continued on page 13

Continued from page 11

Quarantine in a remote area, specifically designed for this purpose, is always a necessary precautionary measure.

Professionals and visitors should be met in an area equipped with a foot dip or boot washing facilities.

With vehicles, trucks for animal carcase disposal pose the greatest risk of contamination. Therefore, a secure place should be provided for carcases to be stored away from the farm premises. Other vehicles (those of livestock dealers, inseminators, etc) should not move onto the farm or have access to the animals.

● **Installation of sanitary barriers and biosecurity on site:**
It should be emphasised that attention should be paid to cleansing the area just in front of the entrances, cleansing and disinfection of water supply installations, disinfection of entrances and drainage around the barns, as well as their drying during the depopulation period.

● **Immediately after disinfection, any recontamination should be avoided by:**
• Providing foot dips at entrances.
• Providing a functional washbasin and a foot dip (or an outdoor tap) for visitors, and clean boots and dedicated clothing in each of the barns.
• Cleansing and disinfecting the tractors and trailers used for manure removal.

● **Limitation of contaminant spread inside the livestock farm**
Animals at risk should be protected and isolated. Neonates are a priority and being born in a calving box limits the infection. They should remain isolated from the older calves: placing them in an individual box until they are two weeks old is the best solution, and then they should be collected in small groups of the same age in individual boxes.

If it is not possible to provide individual accommodation, the isolation of calves of up to three days of age in a well-isolated nursery with its own equipment (foot dip, special clothing) is a good measure.

● **Strict rules of hygiene and management of the rearing process should be administered:**
• Cleansing of the barns (collecting the litter and cleaning).
• Disinfection of the barns with a disinfectant with oocysticidal, bactericidal, fungicidal and virucidal activity (Prophyl S).
• Regular disinfection of the used equipment (boots, clothes, small equipment) by means of spraying or soaking.
• If the animals are reared by the same person, then the diseased should be looked after last to avoid spread.

● **Depopulation period:**
The stage of disinfection should be followed by a depopulation period during which any presence of animals in the disinfected barn should be excluded. This period allows for the disinfectant to continue its action and especially, for the soil and the floor to dry.

In cattle breeding, these attempts to disinfect are made when the animals are brought out to pasture, so that the depopulation period is as long as possible.

Raising animal defences

Early intake of a quality colostrum is essential. It allows the strengthening of defences of calves through the intake of maternal antibodies from the dam. Specific protection may be transmitted by vaccinated mothers against viruses (rota, corona) and certain strains of E. coli. There is, to date, no vaccine against cryptosporidiosis but it is important to note that, after an infection, the recovered animals are immune.

Therapy

Therapeutic agents and treatment strategies for cryptosporidiosis have been pursued for over 40 years since cryptosporidium was first identified in humans.

Several molecules have been evaluated but, up to now, only two have been assessed with satisfactory results in veterinary medicine: halofuginone and paromomycin sulphate.

The suitability of the prophylactic use of halofuginone lactate (Stenorol Crypto) to reduce oocyst excretion is consistent but concerning diarrhoea-treatment, only Paromomycin sulphate (Parofor Crypto) shows efficacy. Parofor Crypto was successfully used in calves where it reduced the incidence and severity of diarrhoea. ■

References are available from the author on request

Fig. 2. Study in a dairy farm in Germany with a confirmed history of cryptosporidiosis. Paromomycin 20% oral solution (Parofor Crypto) was administered orally at a dosage of 50mg/kg once per day for seven consecutive days in the treated group.