Effectve biosecurity: Cryptosporidiosis control in ruminants

Cryptosporidiosis is an intestinal parasitosis caused by Cryptosporidium, protozoa belonging to subclass Coccidia, phylum Apicomplexa. In ruminants, cryptosporidiosis is presented, with neonatal diarrhoea, with the most important aetiologic agent Cryptosporidium parvum.

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Cryptosporidiosis is not host specific and can develop, with or without clinical manifestations, in many hosts, including humans.

Oocysts, the resistant forms of the parasite in the external environment, contain spores and are directly infectious. They can survive for several months in the external environment.

Source and transmission of infection

Oocysts are responsible for the transmission of infection via the faecal-oral route, via licking the contaminated surface or ingesting water or different contaminated feed. As non-specific parasites, cross-parasitic invasions can occur between cattle, goats and sheep when sharing premises or pastures, and between animals and humans on the farm.

Cryptosporidiosis in ruminants

Ruminants are most susceptible in the neonatal period. Along with E. coli, rotavirus and coronaviruses, C. parvum, alone or in combination, is one of the most common pathogens of neonatal diarrhoea. Cryptosporidiosis is most common at peak times or at the end of the calving period, when the concentration of animals is the highest.

The disease occurs with diarrhoea in neonates, most commonly aged between five and 15 days. If C. parvum is the only aetiological agent, there is a high morbidity but no mortality in calves, contrary to what is observed in small ruminants, where the fatal outcome is frequent due to a lack of early treatment. After the first infection is overcome, the animals are immunised but continue to secrete a few numbers of oocysts. There are no symptoms in older animals, but they are a reservoir of parasites.

Disease control

Colostrum administration and quality nutrition, as well as the prevention of viral and bacterial pathogens, can reduce the severity of C. parvum-related diarrhoea. 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.
  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 footdip or boot washing facilities. With vehicles, trucks for animal carcass disposal are the greatest risk of contamination. Therefore, a secure place should be provided for carcasses to be stored away from the farm premises. Other vehicles (those of livestock dealers, inseminators, etc) should not move on the farm and 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 footdips at entrances.
  • Providing a functional washbasin and a footdip (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 the age of two weeks is the best.

Table 1. Resistance to external environment of infectious agents responsible for neonatal diarrhoea in cattle.

<table>
<thead>
<tr>
<th>Viruses</th>
<th>Rotaviruses, BVD, Coronavirus (in presence of organic matter)</th>
<th>Several months</th>
<th>Several weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria</td>
<td>Colibacilli, Clostridia, Salmonella</td>
<td>Several months</td>
<td>Several years (spores)</td>
</tr>
<tr>
<td>Parasites</td>
<td>Cryptosporidium, Coccidia, Ascaris, Strongyloides</td>
<td>1-2 years</td>
<td>Several years</td>
</tr>
<tr>
<td></td>
<td>Live in the external environment</td>
<td></td>
<td></td>
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</tbody>
</table>

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The mobility of disinfectants in dry soils is low to moderate. Conversely, wet soils represent an important process of phenol transfer. Prophyl S diluted in water at a concentration of 2% should be sprayed on soils – 0.3-0.5 litre of disinfection solution per m². This considerable coverage is due to the fact that the soil must be well moistened to allow the product to penetrate deeply. On the other hand, the humidity should not be too high for the barns to be dry when the animals arrive.

It is important to never conduct double treatment – with lime or soda and then with Prophyl S, the main effect of which would be to reduce the efficiency of disinfection due to the mutual neutralisation of the products. In addition to soil, disinfection should also be carried out on walls up to the animal height as well as equipment (clothing, boots, gloves, various utensils). Prophyl S is broad spectrum and proven to be effective, according to the new European standards, in a 2% solution for footdips and wheeldips for one-minute contact time and vehicle disinfection for five-minute contact time.

Disinfection with Prophyl S at 2% allows for sixfold soil disinfection – bactericidal, fungicidal, yeasticidal, virucidal, mycobactericidal and oocysticidal.