

# Understanding and preventing neonatal diarrhoea in calves

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It is generally accepted that water content in an adult animal of any species is around 60-70% of its body weight, although in the case of very young individuals this amount reaches up to 75-83%.

Body water cycles in and out of the intestinal tract as part of digestion: about 25% of body water cycles through the intestinal tract daily. There are two forms of disruption to this intestinal water cycle:

- Malabsorption (normal liquid secretion into the intestine, reduced back out).
- Hypersecretion – most infectious diarrhoeal agents (excess liquid secretion into the intestine, overloaded reabsorption back out).

Dehydration occurs when the body does not have the fluid it needs to function properly. One of the main causes of dehydration is diarrhoea, because the body loses more fluid than it can take in. This can be particularly dangerous in young animals. Severe dehydration can cause the kidneys to shut down.

Diarrhoea is defined as an increase in frequency, fluidity, or volume of faecal excretion.



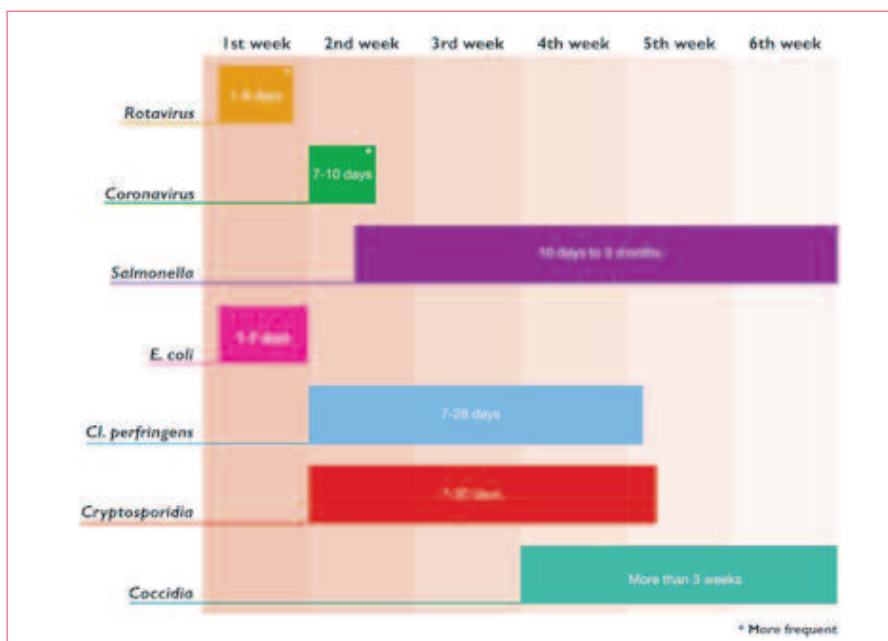
**Mechanical diarrhoeas are usually caused by bad practices in calf nutrition management or from stress.**

The faeces may contain blood or mucous and be smelly, and the colour of the faeces may be abnormal. Diarrhoea leads to a net loss of water, sodium, potassium, and bicarbonate.

There are many causes of diarrhoea, but we can divide them into two groups: infectious and mechanical/nutritional. Infectious scours usually cause the highest mortality, however we must bear in mind that nutritional or mechanical scours can rapidly evolve to an infectious process if the situation is not controlled at the earliest opportunity.

Neonatal diarrhoea is one of the most important causes of death in calves aged from 12 hours to 35 days. It is responsible for high economic losses because its prevalence can be higher than 60% and mortality may reach 20%. Etiologic agents of calf diarrhoea can be infectious or non-infectious.

**Fig. 1. The occurrence of infectious diarrhoea in calves.**



## Infectious calf diarrhoea

A wide range of pathogens may be involved in calf scours:

- Bacteria: E. coli, salmonella and clostridium (type C).
- Virus: rotavirus, coronavirus, parvovirus. Less common are: BVD, IBR and Bluetongue virus (BTV). In some cases: enterovirus, adenovirus and chlamydia.
- Protozoa: coccidia: eimeria and cryptosporidia.

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● Fungus: associated with overuse or continuous changes in medication: *Candida albicans*.

The occurrence of infectious diarrhoea in calves is shown in Fig. 1 on the previous page.

Whatever the infectious agent may be, other predisposing factors facilitate its action. These factors, also known as environmental factors, are usually related to management conditions on the farm and include:

- Overcrowding.
- Poor sanitary conditions (for example no good hygiene and disinfection of facilities between batches, no biosecurity measures in and around the farm, vaccination and antiparasitic programs not well implemented, etc).
- Inadequate colostrum intake.
- Mother's age (older cows' colostrum shows higher variety of antibodies than first-farrowing cows' colostrum).
- Inadequate maternity pens and facilities (dirty, contaminated, humid).

### Non-infectious diarrhoea

Mechanical or non-infectious diarrhoea is usually caused by bad practices in nutrition management, although stress may affect the immune status of animals or diminish milk/feed consumption.

● Nutrition: overfeeding, supplementation of milk replacers with low digestible proteins for calves, changing from waste milk to milk replacers, mixing errors when preparing the milk replacer, milk or milk replacer served at less than 15°C, long intervals of time between milk intakes, changing the milk replacer brand, consumption of lush pasture or high energy diets.

***If not controlled at the earliest opportunity mechanical scours may lead to an infectious process.***



The use of milk replacers can easily lead to scours if not managed carefully. Inappropriately formulated milk replacers and over-feeding produce scours by malabsorption.

Vegetable (especially soybean) products are commonly used as protein sources in the manufacture of milk replacers. Depending on the degree of refinement, these products may contain carbohydrates that are indigestible in young calves. Such carbohydrates are not absorbed in the small intestine and may contribute to diarrhoea via colonic fermentation.

In addition, most calves under three weeks old appear to have an allergic reaction to soy proteins, which results in villous atrophy, leading to diarrhoea that is probably malabsorptive. In these cases diarrhoea will probably stop when the offending agent is stopped.

● Stress: transport, weather, vaccinations and dehorning.

### Treatment must be early

Treatment will depend on the causative agent, so appropriate diagnosis should be done. The severity of the process, time since diarrhoea started, and grade of dehydration must be taken into account when implementing the treatment.

Diarrhoea leads to a net loss of water, sodium, potassium, and bicarbonate; if severe, the calf develops hypovolaemia, hyponatraemia, acidosis, and prerenal azotemia. So it is important to stop water and electrolytes loss as soon as possible.

When administering oral fluids and electrolytes we must be careful not to mix them with milk because this will prevent curd formation and the milk is then of no benefit. We should wait 15-20 minutes after feeding milk.

When treating mechanical or mild diarrhoea, oral rehydration, mucosa protectors (for example pectins), some nutritional support, and astringent substances that make faeces more solid may become a first approach treatment.

Astringent substances – such as products based on carob, carrot and rice flours – can also be used as prophylaxis when changing the diet of animals, or changing the milk replacer brand for instance.

In the case of severe diarrhoea parenteral rehydration is recommended. If there is septicemia and the bacterial infection has over-passed the intestinal barrier, parenteral antimicrobial treatment should be used, although antibiotics will not be active against bacterial toxins.

Diarrhoea treatment must start at the earliest opportunity because even nutritional or mechanical scours can rapidly evolve to an infectious pathology if the situation is not rapidly controlled. ■

*References are available from the author on request*