



Zoetis Animal Health Pages

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Calf scours

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It is no secret that calf scours remains a serious problem globally.^{2,3,4} It can be an intimidating problem to deal with, since there is usually a significant impact on the welfare of the affected animal(s) and it can lead to the farmer experiencing some stressful situations and possibly serious economic implications.^{2,3,6} The potentially fatal consequences of calf scours include dehydration, electrolyte imbalance and acidosis.^{1,6}

The inciting causes are multifactorial and can broadly be classified as either infectious or non-infectious, or sometimes a combination of both.^{1,2,3,5} Taking a closer look at the infectious causes, multiple pathogens have been implicated including different viruses, bacteria and protozoa.¹ While there is often a primary agent responsible, the involvement of multiple factors and pathogens leading to even more severe morbidities and higher mortalities, is common.^{1,2,3,6}

Some of the pathogens that have been isolated in cases of neonatal calf diarrhoea have been listed in the below table:^{1,3,5}

Viruses	Bacteria	Protozoa
Bovine rotavirus	<i>Salmonella</i> spp.	Coccidia
Bovine coronavirus	<i>E. coli</i>	<i>Cryptosporidium</i>
Bovine viral diarrhoea virus (BVDV)	<i>Clostridium perfringens</i>	<i>Giardia</i>

It has been mentioned (obviously depending on the situation, country etc.) that the pathogens mostly implicated in calf scours are Bovine rota- and coronaviruses, *Escherichia coli* and *Cryptosporidium parvum*.^{2,4,6}

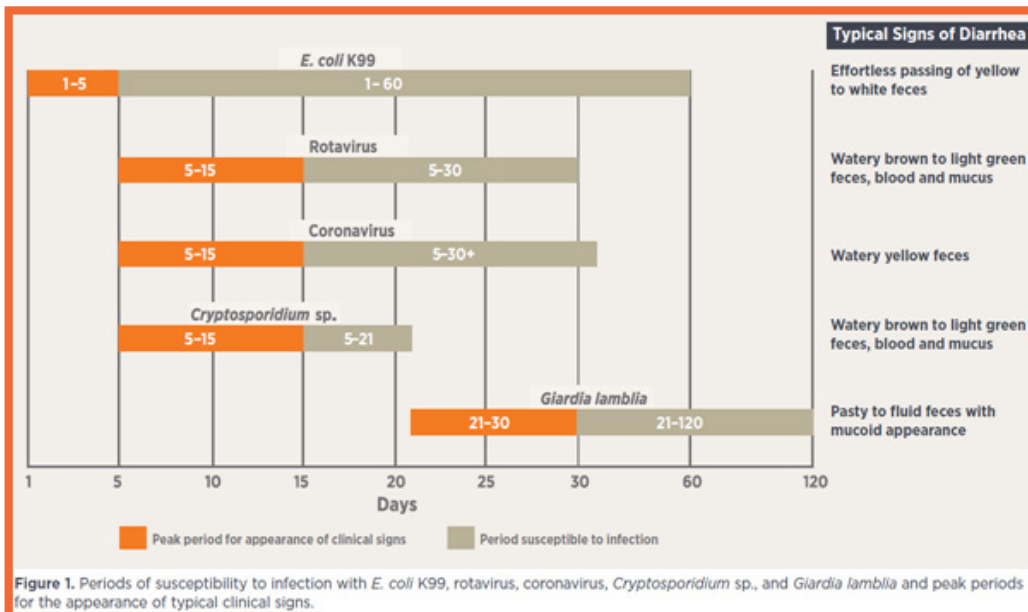
Bovine rotavirus and bovine coronavirus are relatively similar in terms of their mechanisms and clinical presentation in calves.^{5,6} Both viruses have short incubation periods of approximately 24 hours (rotavirus) and 48 hours (coronavirus) and mostly affect calves up to 3 weeks of age, with a peak incidence around a week of age, but have been found in older calves as well.^{1,4,6} Bovine

rotavirus is relatively robust against a wide pH range as well as high temperatures.¹ Seven serogroups (A-G) of rotaviruses are known, however group A is implicated in most infections of domestic animals.¹ Group A can then be divided into subtypes P (27 types) or G (16 types), of which G6 and G10 have been found to be of highest incidence in cattle.¹

Looking at cryptosporidiosis, I think most ruminant veterinarians will agree that this pathogen wreaked havoc throughout our country in the past few years. *Cryptosporidium parvum* has been implicated as a major pathogen in calf scours.⁵ Cryptosporidiosis seems to affect neonatal calves as early as 3 to 5 days of age and can last for a few days to weeks.^{4,5} This protozoa can also affect humans, therefore infections with *Cryptosporidium* can potentially lead to zoonosis.^{1,4} It is thought that this is a primary pathogen, predisposing the animal to secondary infections.¹ The lifecycle of *Cryptosporidium* is very similar to that of coccidiosis, albeit shorter, with the exception that this pathogen has the ability to auto-infect with the help of thin-walled oocysts.^{1,4,6} Another difference, is that excreted thick-walled oocysts of *Cryptosporidium* are already sporulated and therefore immediately infective, in contrast to *Coccidia* oocysts that need to undergo a process of sporulation in the environment, before they become infective.^{1,4}

Naturally, we can't talk about Cryptosporidiosis without mentioning *E. coli*. *E. coli* is divided into six groups, depending on their virulence, with some sources claiming enterotoxigenic *E. coli* to be the most common cause of neonatal diarrhoea.^{1,4} This type of scours affects very young calves up to 4 days old since usually by day 5 of age, the pH of the calf's abomasum has dropped sufficiently low (from around 6 or 7 to less than 2), to kill ingested enterotoxigenic *E. coli*.^{1,4} The pH of the intestinal fluid gradually increases as you move caudally through the gastrointestinal tract, which favours K99 antigen attachment and colonisation of the *E. coli*.^{1,4}

Keep this in mind when choosing the appropriate fluid therapy since oral replacement fluids that increase the pH might exacerbate the problem, but on the other side of the coin, the acidosis caused by *E. coli* affected animals can be so severe that it could lead to death within 12-24 hours.^{1,6}



Adapted from Zoetis Technical Bulletin DIA-00101⁶

Some of the non-infectious factors that can be involved in calf scours could include nutrition, management, immunity, stress and infection pressure.^{1,2,4,5} It is important that pregnant dams are looked after well, since their malnourishment could potentially affect the calf's eventual growth and productivity as well as its disease resistance.¹ Calves that survive a dystocia might suffer from a swollen head and tongue as a result of the difficult birthing process and hence fail to suckle colostrum during those first critical six hours.¹ Frankly speaking, colostrum management as a whole is of vital importance to the resistance of calves to scours.^{1,4,5} Remember that most heifers are naturally more prone to dystocia and producing colostrum of poorer quality when compared to their multiparous herd mates and for that reason, they should be managed a little differently and with a closer eye.¹ Stress and immunity also have somewhat inverse relationships, therefore animals should be kept as stress free as possible. Any extreme weather conditions can potentiate calf scours through suppression of the immune system and indigestion.^{1,3} Infection pressure is an obvious one – the higher the pathogen load in the environment, the bigger the chances of that calf becoming infected.¹ Although infection pressure may be difficult to manage, implementing strategies that will limit co-mingling of different age groups and overcrowding coupled with removal of clinically affected animals to hospital pens and maintaining a clean and hygienic environment, will go a long way.¹

Even though scours can progress very rapidly and treatment needs to be instituted as soon as possible, it is also important to make a swift and accurate diagnosis, in an effort to plan future interventions to protect unaffected animals or prevent further outbreaks.^{1,2,6}

WITNESS® BoviD-5 test kit from Zoetis provides veterinarians with a quick and reliable point-of-care solution that can detect antigens of rota- and coronavirus, *E. coli* K99, *Cryptosporidium* and *Giardia* in calf faeces.⁶ This kit can be used as a screening test and only requires about 10 minutes until test results can be interpreted.⁶ Although this test is very sensitive and specific for the different antigens, diagnostic results need to be followed up and confirmed with

further laboratory findings and interpreted carefully along with clinical signs, an in-depth farm history and knowledge of the management and procedures on farm, since presence of a pathogen is not always necessarily indicative of causality, just as failure to isolate the pathogen does not necessarily absolve it from being responsible either.^{1,2,6}

Prevention of disease is always first prize, especially to safeguard the welfare of the animals.¹ One way to assist in prevention of disease in calves, is through vaccination of the dam a few weeks before parturition with vaccines that are safe for use in pregnant

animals, in an effort to improve colostrum quality.¹ **Scourguard® 4KC** can be used for the vaccination of healthy, pregnant cows and heifers as an aid in preventing diarrhoea in their calves caused by bovine rotavirus (serotypes G6 and G10), bovine coronavirus, enterotoxigenic strains of *E. coli* having the K99 pili adherence factor and *Clostridium perfringens* type C. Remember, even if the dam is vaccinated, good colostrum management is key to the prevention of calf scours and therefore need special attention.^{2,3,4,5}

References:

1. Cho Y, Yoon KJ. 2014. An overview of calf diarrhea – infectious etiology, diagnosis and intervention. *J. Vet Sci* 15(1):1-17.
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5. Arsenopoulos K, Theodoridis A, Papadopoulos E. 2017. Effect of colostrum quantity and quality on neonatal calf diarrhoea due to *Cryptosporidium* spp. infection. *Comparative Immunology, Microbiology and Infectious Diseases* 53:50-55.
6. Zoetis Technical Bulletin DIA-00101. WITNESS BoviD-5 Test Kit for detection of *Cryptosporidium* sp., Rotavirus, Coronavirus, *E. coli* K99, and *Giardia lamblia* antigen in calf faeces. June 2016.

ScourGuard® 4KC: Reg. No.: G3841 (Act 36/1947). Inactivated bovine rotavirus (serotypes G6 and G10), coronavirus, K99 *E. coli* bacterin and *Clostridium perfringens* Type C toxoid.

For animal use only.

For full prescribing information refer to the package insert approved by the medicines regulatory authority.

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