

Scouring the Depths: Unraveling the Complexities of Calf Diarrhea

Scours in beef cattle, a syndrome manifesting as diarrhea, presents a significant challenge in animal health. As highlighted by the USDA's report, 18.9% of young beef cattle illnesses are attributed to digestive issues resulting in high numbers of calf mortality post-weaning. This condition poses immediate health risks and leads to long-term consequences, such as a 4% reduction in weaning weights (Anderson et al., 2003).

At the heart of this issue are various pathogens, including Bovine Coronavirus (BCoV), Bovine Rotavirus (BRV), Bovine Viral Diarrhea Virus (BVDV), and several bacterial infections like Salmonella, E. Coli, and Clostridium species, along with the protozoa Cryptosporidium spp. (Mukhtar et al., 2015). The intestinal damage triggered by these pathogens significantly hampers the animal's ability to absorb nutrients, leading to dehydration, electrolyte imbalances, and, in severe cases, death (Stoltenow and Vince, NDSU AS-776).

Scours vary across individual animals and infections. The syndrome's complexity is further evidenced in findings from The University of Missouri's Veterinary Medical Diagnostic Laboratory, with 42.1% of beef calves' digestive lesions classified as enteritis (Rivero et al., 2022).

Understanding the Infectious Etiology of Scours

Major and Emerging Pathogens

As reviewed by Cho and Yoon (2014), scours in beef cow-calf operations can be caused by 10 different enteric pathogens. Emerging pathogens of note are Bovine Caliciviruses and Bovine Torovirus (BToV). Notably, scours affect newborn or unweaned calves.

Clinical Presentation of Viral Pathogens

Rotavirus: The NSP4 (nonstructural glycoprotein 4) of rotavirus acts as an enterotoxin, disrupting cellular homeostasis by increasing cytoplasmic calcium ion levels. This leads to lesions and drastic nutrient and water absorption changes, culminating in scours.

BCoV: This virus can present in three distinct clinical syndromes: calf diarrhea, winter dysentery, and as part of bovine respiratory disease (BRD). All begin in the small intestine. A BCoV infection may cause a fever ranging from 103.1-104.4°F within 4-5 days post-infection,

followed by fluctuations in blood lymphocytes and a spike in fecal antibodies (Ridpath et al., 2020).

BVDV: Symptoms include low-grade fevers, leukopenia, anorexia, diarrhea, depression, reduced milk production, oral ulcerations, hemorrhagic syndrome, and lymphopenia, often leading to secondary infections.

Clinical Presentation of Bacterial Pathogens

Salmonella: Salmonella typically causes scours characterized by watery, mucoid diarrhea with fibrin and blood. The bacteria initially invade the intestinal mucosa and lymphoid tissues, leading to systemic disease.

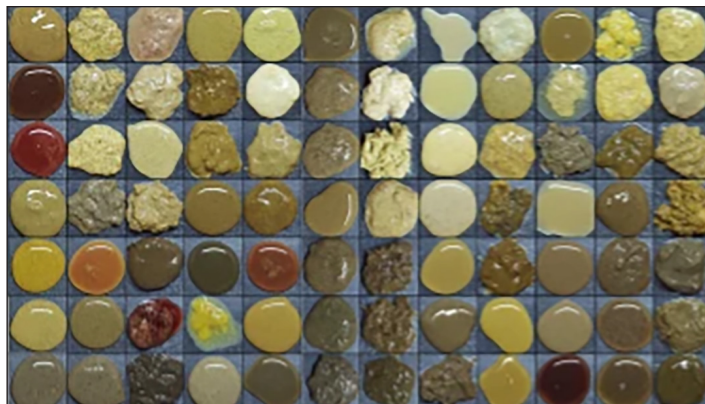
E. coli: This bacterium targets the distal portion of the small intestine, where its adhesion leads to villous atrophy and cell loss. The resulting endotoxins increase chloride secretion into the gut, leading to diarrhea.

Clostridium perfringens: The toxins produced by this bacterium cause cell lysis through phospholipid membrane hydrolysis, resulting in cramping and diarrhea in calves.

Conclusion: Combating Scours for a Healthier Future in Beef Cattle

In conclusion, scours in beef cattle, a multifaceted clinical syndrome, remains a significant challenge in animal husbandry. Its impact ranges from immediate health concerns to long-term repercussions on cattle growth and farm economics. The complexity of this condition, stemming from various enteric pathogens, underscores the need for a comprehensive and nuanced approach to prevention and treatment.

Effective management of scours involves a blend of traditional practices and innovative techniques. A critical factor in the fight against scours is enhancing colostrum quality through proper maternal nutrition and management. The



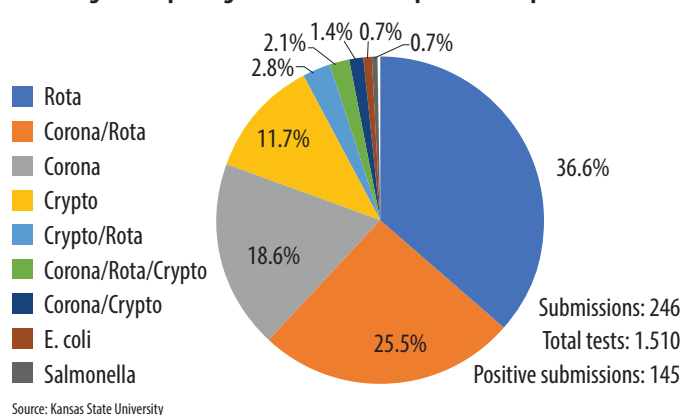
▲ **Figure 1.** Different Visual Observations Of Scours Or Diarrhea In Calves, Adapted From Kim et al., 2021.

transfer of passive immunity via colostrum is paramount in safeguarding neonatal calves against this debilitating condition. Emerging technologies, offer promising new avenues for mitigating scours, with studies showing potential benefits in reducing the incidence and improving overall animal health and growth.

Cattle producers and their veterinarians can take advantage the ISPrime Cow-Calf Diagnostic Program from Medgene to compare DNA from scours samples taken on their farm to Medgene's library of genetic sequences. Medgene has kits available for cattle producers to utilize in taking fecal samples.

This article has highlighted the diverse etiology of scours, the clinical presentations of the various pathogens involved, and the multiple strategies for mitigating this condition. As we continue to advance our understanding through science and innovation, the agricultural community remains committed to improving the health and well-being of beef cattle. By enhancing proven methods and novel research, we can look forward to a future where scours are a manageable concern in beef cattle rearing.

% Pathogen and pathogen combinations in positive samples:



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