

Most common causes of diarrhea in adult calves.

Bulent Elitok*

Department of Internal Medicine, Faculty of Veterinary Medicine, Afyon Kocatepe University, Afyonkarahisar, Turkey

Abstract

The health conditions of adult calves have not been well studied, although morbidity and mortality of neonatal calves has been subjected to a large number of studies. The limited studies find out that the diarrhoea and respiratory diseases have been found to be the most common diseases in adult calves. The other important point is that overall diseases incidence has been reported to be lower in adults calves than in younger ones. The aim of this review is to provide information about most common causes of diarrhea in adult calves.

Keywords: Diarrhea, Adult, Calves, Sputum.

Accepted on 08 May, 2018

Introduction

For the consumer, the conditions the animals are kept in are an increasingly important aspect of the quality of dairy products, making this a valuable sales argument for the dairy industry. Suboptimal management of and a suboptimal environment for calves are not only an animal welfare issue, but also have a direct economic impact on the farming enterprise as they are likely to result in a higher calf morbidity and lower growth rates [1].

Calf diarrhea is still the most frequent and significant economic loss to cattle breeding [2,3] although improved maintenance and nutritional conditions and major advances in biopharmaceuticals have been achieved [4]. In fact, diarrhea is a complex, multi-factorial, and dynamic symptom with the host's balance between resistance and etiologic pathogens. It has a multifactorial etiology [5-8] in which viruses, bacteria, protozoa and also management factors (shelter, nutrition, hygienic conditions) play a role.

The etiology of infectious diarrhea is associated with enterotoxigenic *Escherichia coli* (*E. coli*), *Cryptosporidium parvum* (*C. parvum*), rotavirus, coronavirus or combinations of these pathogens [3,9,10]. Although the mechanisms of action and pathogenesis of each of these agents vary, they cause diarrhea, both by disrupting the body secretion system and by causing malabsorption/malformation [11].

Despite the large number of studies carried out in the early ages of calves, the health of the more mature ones has not been investigated sufficiently. It is reported that calf deaths in the neonatal period are higher than those in the adult cycle, while adult calf deaths are also at significant levels [3,5,12-14]. Olsson et al. [14] found that the morbidity rate in 3-15 months calves was 4.6%, of which 2.4% were caused by gastrointestinal diseases such as diarrhea and 1.6% by pneumonia. As a matter of fact, the incidence of diarrhea due to developing immune systems is decreasing with age [5,15].

The calves are kept in individual shelters during the neonatal period while the adults are kept together. This leads to the rapid

spread of some diseases, such as the respiratory system, among animals [10]. Pathogens in the lung and respiratory tract, which are the result of the swallowing of sputum-like excretions by the animal during respiratory system problems, are also transmitted to the digestive tract [16-18]. The changes in stress and nutritional conditions lead to the new attacks of these pathogens, and cause the diarrhea. Later identification of sick animals in flocks increases the incidence of diseases in adult calves [19-21].

Factors such as *Cryptosporidium* spp., *Eimeria* spp., *E. coli*, *Salmonella* spp., rota and corona viruses effective in neonatal calf diarrhea have also been identified in feces of the adult calves [3,21]. When the immune system weakens for some reason, such as stress, malnutrition, these pathogenic factors can lead to diarrhea by re-attacking in the later ages [9,11,22]. Even after an infectious agent has been identified, it is often difficult to determine whether diarrhea is caused by this agents in adult animals or herd, because healthy calves are constantly keep these agents in their gastrointestinal tract and continue to spreading out them by their fecal matters [19-21].

Moreover, restoration of normal gastro-intestinal flora is crucial in preventing disease, while deterioration of intestinal flora by some agents such as antibiotics and inflammations lead to increase in the incidence of diarrhea [23].

Besides infectious agents, non-infectious factors such as bad condition of shelters, care and nutrition, and the applications of false drugs and feed additives also play a very important role in predisposition of the etiology in adult calf diseases [17,18,24,25]. It should be noted that the management and control of calf diarrhea before an outbreak is more cost-efficient than treating sick animals after the outbreak occurs [3].

References

1. Lundborg GK, Svensson EC, Oltenacu PA. Herd-level risk factors for infectious diseases in Swedish dairy calves aged 0-90 days. *Prev Vet Med.* 2005;68:123-43.

2. Waltner-Toews D, Martin SW, Meek AH. An epidemiological study of selected calf pathogens on Holstein dairy farms in southwestern Ontario. *Can J Vet Res.* 1986;50:307-13.
3. Cho YI, Yoon KJ. An overview of calf diarrhea - infectious etiology, diagnosis, and intervention. *J Vet Sci.* 2014;15:1-17.
4. Al Mawly J, Grinberg A, Prattley D, et al. Risk factors for neonatal calf diarrhoea and enteropathogen shedding in New Zealand dairy farms. *Vet J.* 2015;203:155-60.
5. Bendali F, Bichet H, Sanaa M, et al. Pattern of diarrhoea in newborn beef calves in south-west France. *Vet Res.* 1999;30:61-74.
6. Lorenz I. Diarrhoea of the young calf:an update. In:Proceedings of the XXIVth World Buiatrics Congress, Nice, France. 2006;130-8.
7. Blanchard PC. Diagnostics of dairy and beef cattle diarrhea. *Vet Clin North Am Food Anim Pract.* 2012;28:443-64.
8. Brenner I, Elad D, Trainin Z, et al. Epidemiological study of neonatal calf diarrhea in Israel. A oneyear survey of faecal samples. *Isr J Vet Med.* 1993;48:113-6.
9. Gulliksen SM, Jor E, Lie KI. Enteropathogens and risk factors for diarrhea in norwegian dairy calves. *J Dairy Sci.* 2009;92:5057-66.
10. Svensson C, Lundborg K, Emanuelson U, et al. Morbidity in Swedish dairy calves from birth to 90 days of age and individual calf-level risk factors for infectious diseases. *Prev Vet Med.* 2003;58:179-97.
11. Foster DM, Smith GW. Pathophysiology of diarrhea in calves. *Vet Clin North Am Food Anim Pract.* 2009;25:13-36.
12. Gardner IA, Hird DW, Utterback WW, et al. Mortality, morbidity, case-fatality, and culling rates for California dairy cattle as evaluated by the National Animal Health Monitoring System 1986-87. *Prev Vet Med.* 1990;8:157-70.
13. Jenney BF, Gramling GE, Glaze TM. Management factors associated with calf mortality in South Carolina dairy herds. *J Dairy Sci.* 1981;64:2284-9.
14. Olsson SO, Viring S, Emanuelson U, et al. Calf diseases and mortality in Swedish dairy herds. *Acta Vet Scand.* 1993;34:263-9.
15. Frank NA, Kaneene JB. Management risk factors associated with calf diarrhea in Michigan dairy herds. *J Dairy Sci.* 1993;76:1313-23.
16. Barker IK, Van Dreumel AA, Palmer N. The alimentary system. *Pathology of Domestic Animals.* 1993;1-300.
17. Blood DC, Radostits OM. *Veterinary Medicine.* 1989;Bailliere Tindall, London.
18. Meganck V, Piepers GH, Opsomer G. Evaluation of a protocolto reduce the incidence of neonatal calf diarrhoea on dairy herds. *Prev Vet Med.* 2015;118:64-70.
19. Janke BH. Protecting calves from diarrhea. *Veterinary Medicine.* 1989;84:803-11.
20. Fagan JG, Dwyer PJ, Quinlan JG. Factors that may affect the occurrence of enteropathogens in the feces of diarrhoeic calves in Ireland. *Ir Vet J.* 1995;48:17-21.
21. Uhde FL, Kaufmann T, Sager H, et al. Prevalence of four enteropathogens in the faeces of young diarrhoeic dairy calves in Switzerland. *Vet Rec.* 2008;163:362-6.
22. Izzo MM, Kirkland PD, Mohler VL, et al. Prevalence of major enteric pathogens in Australian dairy calves with diarrhoea. *Aust Vet J.* 2011;89:167-73.
23. Gomez DE, Arroyo LG, Costa Mcviel L, et al. Characterization of the Fecal Bacterial Microbiota of Healthy and Diarrheic Dairy Calves. *J Vet Intern Med.* 2017;1-11.
24. Sangwan ML, Anand GR, Dwarkanath, PK. Genetic and non-genetic factors affecting plasma immunoglobulin levels in crossbred calves. *Indian Journal of Dairy Science.* 1987;40:104-10.
25. Malmuthuge N, Li M, Goonewardene LA. Effect ofcalf starter feeding on gut microbial diversity and expression ofgenes involved in host immune responses and tight junctions indairy calves during weaning transition. *J Dairy Sci.* 2013;96:3189-3200.

***Correspondence to:**

Bulent Elitok

Faculty of Veterinary Medicine

Department of Internal Medicine

Turkey

Tel:+90 (553) 969 52 89

E-mail id:elitok1969@hotmail.com