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Probiotic supplementation to produce healthier calves: A short note

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Abstract

Probiotics are good live micro-organisms and are conceivably able to modulate the balance and biological activities of the gastrointestinal (GI) microflora. Probiotics are viewed as advantageous to the host. Different types of probiotics have positive effects on various digestive processes in ruminants which include cellulolytic functions, synthesis of microbial proteins, and prevention and control of diseases. Probiotics, used as replacement of antibiotics can effectively protect the calves from gastrointestinal diseases without any harmful effects as well as promote growth and health status by regulating gut micro biota.

Keywords: Probiotic, calves, health, disease

Introduction

Probiotic, a word derived from Latin, means 'for life'. Probiotics are live microorganisms that beneficially affect the host upon ingestion by improving the balance of the intestinal microflora. It enhances intestinal health by modulating gut micro biota and stimulating the gut colonization resistance. Intestine of neonatal calves are sterile during birth that may easily get affected by the environmental pathogens which give rise to number of health problems. Neonatal enteritis, manifested by diarrhea is the paramount health problems in neonatal calves therefore its prevention is important to raise healthier calves. The incidence of diarrhoea increases when *Lactobacillus* population decreases during stress^[1]. The response to probiotics might be greater if administered to newly weaned calves, which are more prone to health problems.

Types of probiotics: Probiotic organisms are mostly gram positive bacteria. It includes *Bacillus* (*B. cereus* var. *toyoi*, *B. licheniformis*, *B. subtilis*), *Enterococcus* (*E. faecium*), *Lactobacillus* (*L. acidophilus*, *L. casei*, *L. farciminis*, *L. plantarum*, *L. rhamnosus*), *Pediococcus* (*P. acidilactici*), *Streptococcus* (*S. infantarius*); other probiotics include microscopic fungi such as strains of yeast belonging to the *Saccharomyces cerevisiae* species^[2]. Lactic Acid Bacteria (LAB) are the well-known probiotic supplements for young calves that find application in regular feeding practices.

Mechanism of action: Probiotics are believed to improve the overall health of the calves by improving the microbial balance in its gut. In general, the mode of action of probiotic feed additives is mainly based on competitive exclusion, bacterial antagonism, and immune modulation, neutralization of enterotoxins produced by pathogens^[3, 4]. In large intestine probiotic will start to multiply and exclude the harmful bacteria and by establishing themselves. This results in increases in the population of beneficial microorganisms, while repressing the number of harmful bacteria. There are two proposed mechanisms by which probiotics may reduce harmful bacteria such as *E. coli*. Firstly, probiotics microorganisms produce some inhibitory substances such as organic acids, hydrogen peroxide and bacteriocins which these antimicrobial-like compounds might be active against some pathogens. Second mechanism is that of competitive inhabitation for harmful bacteria adhesion on intestinal epithelial surfaces.

Beneficial effects: Probiotics significantly improves growth rate in calves by enhancing its body weight gain^[5, 6], body measurements^[7], and dry matter intake^[6].

The increased weight gain may be due to or volatile fatty acids produced by probiotics which improves energy efficiency leads to possible changes in the microbiology and chemistry of the large intestine [8]. 8.16% increase in body weight [9] was reported when supplementing multispecies strain probiotic with the basal diet of calves. Probiotics promote health status by reducing scours and parasitic loads. Probiotics was found to decrease incidence of diarrhoea by 37.3% [10]. According to one report the percentage of calves with diarrhoea for two or more days was reduced from about 50% to 20% among the calves fed the *Enterococcus faecium* M74 diet [6]. The probiotics that enhance immunoglobulin levels have more positive effect on growth performance, production and ability to resist disease.

Conclusion

Probiotics have a positive effect in ruminant animal production by improving their performance and health. Probiotics are generally considered safe and well tolerated. Therapeutic and preventive approaches with probiotics could help to reduce the risks of gastrointestinal diseases and help in minimizing antibiotic resistance.

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