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Editorial

Can Microbials Enhance Commercial Calves' Gut Integrity, Immunity and Health?

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Editorial

Supplemental Microbials (SM) could offer commercial young dairy calves with healthy subjects to enhance gut microbial diversity and host health if calves are managed properly and optimally. The possible helpfulness of SM, however, must not be overstated and overemphasized. The major aim of this editorial was to address whether SM is practically workable in preventing digestive disorders namely diarrhoea. Another aim was to underline the possible efficacy of such products in enhancing calf health and immunity. Protecting newborn calves against infectious diseases and concurrently, improving their health and growth in early life is strictly related to herd economics and production sustainability. Diarrhoea is the most prevalent infectious disease, causing calf morbidity and mortality worldwide. Supplementing dairy calf diets (i.e., milk or starter) with potentially beneficial microorganisms such as bacteria and yeast has been attempted to improve the gut microbial ecosystem and optimize nutrient assimilation and immunity. However, infectious diarrhoea still remains a major problem in many dairy and beef farms around the globe. Since diarrhoea has a multi-factorial nature, it seems that the possible efficacy of SM depends on the environmental and management conditions in which the calves are raised. The rearing system (e.g., individual vs. group housing), diet, environmental microbial load and other management factors are involved in the incidence of diarrhoea. Therefore, using probiotic products may interact with such factors, thus

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influencing their effectiveness and likely causing inconsistencies concerning probiotics' usefulness in commercial dairy farms.

As noted, in modern commercial dairy farming, raising healthy calves with optimal growth and health is key in influencing herds' reproductive and productive performance [1]. Different feeding and housing systems have been developed and recommended to improve calf health, welfare and growth in the early stages of life. For instance, intensive milk feeding systems and new housing designs (pair- or group-housing) are being developed and refined worldwide. In addition to such advances in management practices, supplementation of calf diets with commercially available feed additives such as colostrum supplements, plant secondary metabolites (e.g., phenolic and essential oils), prebiotics and symbiotics, has been an effort to modify and optimize gut microbial ecosystems to help prevent diarrhoea and improve calf growth.

A recent literature review regarding the effects of probiotics on calf growth showed no significant differences between treated and untreated calves [2]. Indeed, in normal rearing conditions, using probiotics may have no or little effects on calf growth. However, under highly stressed conditions (e.g., thermal, transport and nutritional transition stresses), probiotics may show more usefulness. Therefore, other principle management conditions (e.g., nutrition, behaviour, health, comfort, environmental sanitation etc.) must be maintained normal or nearly optimized in any practical scenario. This implies that the possible use of SM must not be overstated and overemphasized.

Preventing diarrhoea is a significant management practice that can affect herd productivity, health and economics. Modification and optimal establishment of the gut microbial ecosystem are necessary for better functioning of the intestinal immune system and avoiding harmful bacteria growth. Numerous environmental and management factors such as maternal effects, environmental contaminations, diet types, antibiotics and probiotics can influence the gut microbiota composition. It seems that probiotics should be administered preferably in the early weeks of life to obtain favorable outcomes. Probiotics may reduce diarrhoea incidence; however, basic management practices including colostrum feeding management, milk feeding, housing system, sanitation protocols and biosecurity must not be disregarded. Under stressful conditions, the use of probiotics may be more efficient, especially concerning calf immunity and growth. Hence, overall, practically and pragmatically, it is a must to clarify that animal responses to dietary SM and their usefulness will largely depend on management conditions.

Conflict of Interest

Authors declare no conflict of interest.

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