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Cereals Bond Trounces Subacute Rumen Acidosis

Editorial Perspective Article

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This perspective article provides a feasible ideology based on which modern ruminant enterprises will learn to vigilantly include mixtures of hard and soft cereal grains in optimizing rumen environment. Subacute Rumen Acidosis (SARA), variably defined as a common and economically important metabolic disease, occurs arguably when rumen pH declines below 5.8-6 for a long-lasting period of time of several hours [1-3]. Prolonged SARA reduces high-producing dairy and beef cattle rumen health. As a result, microbial protein synthesis efficiency drops and microbial population diversity adversely changes [2,4,5]. Meanwhile, endotoxins released from disturbed microbes enter circulation and mediate inadequately known mechanisms towards triggered inflammatory responses and reduced immune function [1,6,7]. As a result of rumen and splanchnic distress, harmonic nutrient and substrate uptake and use by mammary and muscle tissues are impaired. This cascade results in major losses in productivity, health and farm economics [4,8].

A main factor in development of SARA is cereal grains feeding management [3,8]. Soft grains notably barley and wheat are usually highly fermentable early post-feeding. As such, their feeding carries significant risks to maintaining healthy and functional rumen and microbial metabolism [9-11]. Optimizing global approaches in processing and feeding of soft grains for high-yielding ruminants has recently been emphasized [12,13]. On the other hand, harder grains of mainly different corn and sorghum varieties are rather slowly degradable and, thus, their provision could reduce rumen fermentation rate shortly post-feeding. However, durably slow degradation rate may not be considered optimal from a microbial yield perspective. This is because rather slower degradability may increase the likelihood for asynchronous substrate supply to microbes for mass production [1,14]. Therefore, it is contemplated that feeding selected categories of cereal grains including different soft and hard kernels provides diverse microbial groups with variably fermentable starch types and protein compounds. Such an exclusive but versatile and resourceful substrate supply can improve microbial metabolism and health. Furthermore, cereals altogether create a more suitable environment for gradual and successful absorption of organic acids any accumulation of which severely compromises rumen function [5].

As cereal grains usually constitute more than one third of ruminant diets and almost all of the concentrate starch, development of prudent strategies in their dietary inclusion form, rate, combination, and time are of utmost significance. This article yields a practical perspective to optimize starch and nitrogen use by modernized ruminants through optimal dietary adoption of differently degradable grains. Future research will need to enlighten the many angles of the perspective at animal, organ, tissue, cell and gene levels.

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