

Revisiting Feeding Systems in Postmodern Ruminant Agriculture: Challenging the TMR

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Abbreviations: TMR: Total Mixed Ration; SARA: Subacute Rumen Acidosis; CF: Component Feeding

The objective of this editorial article is to revisit the conventional concepts on feeding systems practiced in modern ruminant agriculture production. Total mixed ration (TMR) is a type of preparation that aims to ensure that a nutritionally balanced diet containing forage and concentrate is such uniformly mixed that any bout taken by the ruminant represents the diet calculated on paper. However, this definition is not met in more than many practical scenarios on-farm mainly due to carelessly adopted forage particle size, inappropriately chosen forage choice, inadequate dietary moisture, suboptimal feed items mixing, and considerable particle selection in the bunk.

Unsuccessfully prepared TMR will definitely not meet management goals. A key goal is to help stabilize rumen fermentation and minimize risks from metabolic disorders, such as subacute rumen acidosis (SARA). This adversely affects farm economics by increasing labour and machinery costs and jeopardizing animal health and longevity. Component feeding (CF) of forage and concentrate, conventionally considered risky [1], however, may not be as much disadvantageous as the suboptimal TMR could be. Should feeding frequency be managed thoughtfully to avoid sudden intake of highly fermentable rations, CF will not impair the functional rumen conditions nor will it stress the host ruminant. Recent discoveries suggest that even the very well-prepared standard TMR offers lactating dairy cows really no advantages over CF [2-4]. Moreover, a recent long-term continuous study suggests that lactating dairy cows fed three times daily a diet with forage to concentrate ratio of 50 : 50% produced more milk fat and protein on CF vs. TMR. Peripheral energy metabolism has been improved by feeding CF instead of TMR even in a few-week long study [4]. These findings introduce new challenges to traditional concepts on optimum feeding systems in global ruminant agriculture.

Education must take global initiatives to focus on philosophies and reasons for adopting certain feeding systems rather than defining and describing them based on the conventional science that may not hold in the new times. The world animal agriculture has encountered dramatic changes over the history from differently traditional structures into modern and postmodern forms. The evolution affects animal response to management strategies [5-7]. Many global ruminant industries meet domestic requirements for animal foods whereas many do not. However, in many countries with inadequate domestic production of ruminant foods, the ruminant industry is adequately modern. Aiming to overly maximize production in such regions could increase diseases and considerably reduce longevity and efficiency. This global situation indicates that optimum is certainly not maximum anymore in many ruminant industries around the globe. Even in those developing countries with modern animal agriculture, the insufficient animal food supply may not necessarily increase with maximizing productivity. This would be considered as over-modernization that is a harmful challenge to the industry. In other words, formulating improper diets with risky amount of easily fermentable items and not taking rumen and ruminant physiology into account, and then trying to overcome the challenge with making TMR is not a wise approach. Problems must be prevented and not to be created with a hope for solutions.

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To sum, education for scientists, extensionists and farmers will have to refine and re-establish scientific and management strategies based on the structure and demands of the new global animal agricultural industries. Conventional beliefs must not be considered undebated and clear-cut. This strategy is what the modern ruminant agriculture must go through towards sustainability.

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