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Mini Review

Quality Higher-Forage Diets for Postmodern Dairy Cows to Optimize Animal Health, Milk Nutritional Value, Farm Economics, and Human Food Security

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Abstract

The objective of this article was to underline the importance of formulating higher-forage diets for postmodern dairy cows to improve rumen and animal health, feed and farm economics, environmental quality, and human food security. Concentrate feeds are becoming less available and more expensive. Cereal grains like corn and barley, and protein meals like soybean meal are also human foods that need to be saved preferentially for humans. This trend is why greater emphasis should be placed on improving forage quality and preservation strategies to enable formulating forage based diets for postmodern lactating dairy cows. Feeding high-quality forage will decrease dietary needs for high-energy high-protein concentrates. As a result, rumen and animal health as well as milk nutritional value will improve. Well-preserved alfalfa and corn silages complemented with inexpensive by-products would provide rumen microbes and the host animal with adequate energy, protein and other critical nutrients to support competitive levels of milk production. In addition, milk would be enriched with high levels of fat, protein, and functional substances. It is time to move towards higher forage diets to improve dairy cow health, ration and farm economics, environmental quality, and human food security. .

Keywords: *Forage; Concentrate; Food Security; Animal Health; Farm Economics*

Philosophy and Discussion

The objective of this article was to underscore the significance of formulating higher-forage diets for postmodern dairy cows to improve rumen and animal health, feed and farm economics, environmental quality, and human food security. Concentrate ingredients of mainly cereal grains (i.e. corn, barley, wheat, and sorghum) and protein meals (e.g. soybean meal) are consumed by livestock and especially ruminants at very significant amounts while humans need them as vital foods [1]. As such, livestock compete with humans in consuming these ingredients. Therefore, more profound thoughts should be given on saving more of these foods ultimately for humans [1,2].

Currently, many dairy farmers worldwide feed high levels of concentrate including expensive cereal grains and protein-rich meals [3,4]. Feeding high levels of concentrates may increase milk production for some time, but it would adversely affect rumen and whole animal health as well as fertility. As a result, early culling rate will increase substantively. In other words, many dairy farmers overfeed cereal grains and protein meals to their dairy cows. Accordingly, the incidence of health disorders such as subacute rumen acidosis is common in dairy facilities all over the world [5].

Development of practical strategies to improve animal health and farm economics in the current situation should involve formulating higher-forage diets. This strategy necessitates increasing forage quality. Improving forage quality requires optimizing plant harvesting

strategies (e.g. harvesting at optimal stage of growth and maturity), circadian harvesting time (i.e. harvesting at optimal times of the 24-h period), preservation method (e.g. ensilage vs. drying), and storage quality. For instance, making silage from alfalfa plant instead of making hay has the potential to improve nutritional quality and reduce nutrient waste and feed cost [6]. Another example is forage DM at harvest. High quality forage preservation during ensilage requires forage DM to be optimal pre-ensilage (e.g. approximately 30% for corn silage). Making efforts to retain and optimize alfalfa's nutritional value by making silage instead of hay would be a practical strategy to reduce waste and increase forage nutritional value towards milk solids production [6,7]. Reducing expensive concentrate starches and proteins in postmodern dairy diets is predicted to significantly reduce faecal and urinary excretion of nutrients to the environment, and thereby, contribute to improved environmental quality.

Future research will need to reveal the real worth of higher-forage diets for dairy cows especially at higher levels of milk production from health and economic perspectives. For this objective to be properly met, forage quality must be optimized through development of working strategies, especially for silage production and preservation policies.

Conclusion

Formulating high-quality higher-forage diets should enable optimizing rumen and animal health, diet and farm economics, environmental quality, and human food security. In other words, with higher-forage diets, milk nutritional value will increase and more vital plant and animal foods will become available for human use worldwide.

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