The Utilization of Molasses and Molasses-Based Sugar Blends in Dairy Rations

Nutritionists have used molasses and molasses-based sugar blends for many years to improve palatability and reduce sorting in Total Mixed Rations (TMR) of dairies and feed yards. In addition, producers found that liquids were good carriers for trace minerals, vitamins, phosphorus, protein, propionic acid, and Rumensin™. In recent years the focus of feeding molasses and molasses-based liquid products has shifted to looking at sugar as a nutrient in dairy rations. This interest stimulated the question as to how sugars are utilized in the rumen. West Virginia researchers examined the effects on rumen microbial growth and metabolism of varying sugar concentrations as a proportion of the Non-Structural Carbohydrate (NSC; sugar plus starch) at three concentrations of NSC. Based on their results, a basic recommendation is that the ration should contain a minimum of 24% starch and 5 to 9% total sugars with adequate levels of soluble fiber and rumen degradable protein.

Since this work was done, some nutritionists and producers have used this approach using dry sugars and have had little to no response to increasing dietary sugar concentrations. Three factors appear responsible for the lack of response.

- ✓ Dry sugars readily go into solution and quickly pass through the rumen. On the other hand, liquid sugar blends tend to be absorbed into all the feed ingredients, extending the amount of time they are available in the rumen.
- ✓ Sugars from by-products may not be as available. Hoover and Miller found the sugars in the feedstuffs were only 45% available; whereas, the sugars from the liquid blend were greater than 85% available.
- ✓ A frequent reason is the substitution of sugars for starch, a practice that results in diets that have inadequate starch concentrations. Rations deficient in starch (e.g., <24%) due to replacement with sugars will generally have too much fast carbohydrate.

There have been several publications on sugar performance in dairy rations in the past few years. References for the serious student are cited below.

Additional References

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Hall, M.B. 2002. Working with sugars (and molasses). Pages 146-158 in Proc. 13th Annual Florida Ruminant Nutrition Symp., Gainesville, FL.