Molasses is quite a versatile component of dairy rations. While many people view it only as a source of sugar, uses for molasses extend from its value as a carrier for micro-ingredients to its potential to bind the total mixed ration (TMR) and reduce sorting. Historically, molasses has been used to provide sugars to the cow and, subsequently, to improve the palatability of the ration. The list of benefits of feeding molasses has now expanded to include benefits to the rumen microbial population.

In most dairy cattle diets, carbohydrates account for 65 to 70 percent of the nutrients. Carbohydrates from feedstuffs can be classified into cell wall and non-cell wall components (fiber and non-fiber carbohydrate). Non-fiber carbohydrate (NFC) consists of starch, sugars and pectin. Sugars are a component of NFC and provide a rapidly rumen-available carbohydrate source to support rumen microbial growth.

According to Dr. Mike Allen, “the goal of formulating diets for carbohydrates is to provide low fill, highly fermentable diets that result in consistent fermentation over time.” When sugars are fed along with rapidly degraded proteins, the rumen microbes are provided with the balance of energy and protein needed for optimal microbial growth. Feeding sugars will generally increase microbial protein production. Microbial protein is high-quality bypass protein and is an excellent source of the amino acids required for milk production.

Caution must be taken in adding sugars to dairy rations, particularly considering the tremendous variation in sugar content of feedstuffs and by-products. When sugars are degraded too rapidly, they can depress rumen pH. When fed at high levels, sugars may decrease ruminal fiber digestion. Nutritionists should use caution to ensure that adequate levels of effective fiber and rumen degradable protein are available before adding sugars to the ration.

Basal ration sugar levels are typically two to four percent, although the ideal sugar level is four to six percent. Response to feeding sugar supplements at high levels is greatest with high-silage rations, lower quality dry hays, forages with low-fiber digestibility, high levels of soluble or degradable protein or high-producing cows.

Results from research on feeding molasses and other sugar supplements have been highly variable. Adding sugars to dairy rations can potentially increase milk production and fiber digestibility, increase milk fat or milk protein content, increase microbial protein production and lower milk urea nitrogen (MUN). A recent study by Broderick and Radloff found that adding cane molasses at three percent of dry matter increased dry matter intake, yield of milk protein, increased percent milk protein and solids non-fat and lowered MUN. Feeding higher levels tended to decrease overall performance.

Molasses is an economical source of supplemental sugars for dairy diets. Animal feed is the main market for molasses. Molasses is quite variable in terms of nutrient content, flavor, color and viscosity. In addition to providing soluble carbohydrates, both cane and beet molasses are excellent sources of minerals. Generally, cane molasses is higher than beet molasses in calcium, phosphorus and chlorine content. On the other hand, beet molasses is higher in both potassium and sodium but lower in calcium.

Molasses can be used to replace a portion of the energy provided by starch. The rapidly digested nature of the sugars in molasses increases the animal’s ability to utilize soluble proteins increasing microbial growth and maximizing microbial protein production. Further, it increases the palatability of the ration, reduces dustiness and serves as an economical carrier for many micro-ingredients. Liquid feed supplements are an excellent delivery vehicle for minerals, vitamins and other feed additives.

Finally, adding molasses or liquid feed supplements to a TMR can also reduce ration sorting. The moisture and viscosity of the molasses makes smaller feed particles stick to the larger forage particles, thereby making it more difficult for cows to sort.

References omitted due to space, but are available upon request.

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