

# TECHNICAL BULLETIN

## DAIRY



## TAKING ADVANTAGE OF THE BENEFITS OF FEEDING SUGARS IN TODAY'S MARKET CONDITIONS

With the rising feed ingredient prices, producers are looking for alternative energy and protein sources to control their ration costs. Sugar, from molasses, has always been an excellent carbohydrate to enhance rumen fermentation and milk component production. Sugars from molasses are digested very quickly in the rumen, producing microbial protein and enhancing forage digestion, which improves overall TMR utilization. In current market conditions, QLF's products are very economical relative to other TMR ingredients. It is a golden time for farms to start feeding or increase the feeding rate of QLF molasses based supplements. Here are some key points of feeding sugar:

- 1. Most dairy diets have low basal level of sugar.** In most areas, farms typically feed a large amount of fermented forages and feeds that contain little sugar. Without supplemental sugar, lactating cow rations usually contain about 1.5% to 3% sugar.
- 2. Feed adequate amount of sugar.** A recently published meta-analysis (de Ondarza et al., 2017, Prof. Anim Sci 33:700-707) recommended feeding 6% to 8% dietary sugar for optimal rumen function and milk performance. In a recent webinar by Dr. Mike Van Amburgh from Cornell University, he further emphasized that to feed at least 6 to 7% fermentable sugar to maximize microbial protein synthesis and fiber digestion. "Fermentation sugars" are fast fermenting sugars that can truly drive microbial yields and forage fermentation. They are largely coming from supplemental sugars such as molasses. The "sugars" tested from fermented feeds like corn silages are not considered as fermentation sugar. Due to their size and structure, the water-soluble carbohydrates from a basal ration without added dietary sugars are not fast fermenting, if fermentable at all.
- 3. All sugars are not created equal.** The most effective types of sugars on increasing microbial protein are sucrose, glucose, and fructose, as seen in molasses products. Lactose sugar, found in whey, may be an energy replacement for corn in some cases, but it does not improve forage digestion like sucrose does. Sucrose is the main sugar in cane molasses.
- 4. You can feed a much higher level of sugar.** In areas with high corn prices, it is a common practice to feed over 10% sugar in the diet, with starch in the low 20's. Cows grazing pasture may be consuming over 20% sugar. Cows do not have a starch requirement. Rumen fermentable carbohydrate is a better indication. The more diversified the sources of carbohydrate in the diet, the safer the rumen would be, with an optimal balance of sugars, starches, and fibers.

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- 5. Molasses-based QLF feeds are good sources of rumen-fermentable carbohydrates.** In contrast to ground corn that has up to 70% rumen digestibility, the sugars within QLF feeds are almost all degradable in the rumen. The conversion of sugars into VFAs provides readily available energy and building blocks to support milk component synthesis. Molasses also contains vitamins, minerals, and other bioactive compounds that drive microbial growth. On the per as-fed ton basis, QLF feeds have higher rumen fermentable carbohydrates compared with ground corn. The value of fermentable carbohydrates varies among different corn products due to the differences in digestibility, as a result of the differences in processing methods, particle size etc. This is a key reason why QLF products are more effective and consistent at driving rumen fermentation and microbial synthesis.
  
- 6. Molasses sugars improve milk components.** Field observations reported that herds that are feeding a higher level of sugar generally are producing milk with higher protein and fat. A published meta-analysis (de Ondarza et al., 2017, Prof. Anim Sci 33:700-707) showed that cows produced 3 to 5 pounds per day more 3.5% FCM with 5% to 7% added dietary sugar. Feeding sugar from molasses improves rumen pH and forage digestion that enhances milk components. Using current pricing, even without accounting for the increased milk yield, an increase of 0.1% unit of milk protein will generate additional profit around 20 to 30 cents/cow/d; an increase of 0.1% unit of milk fat will generate additional profit around 12-15 cents/cow/d.
  
- 7. Ration models cannot correctly predict the responses of feeding sugar.** Current ration models cannot fully characterize the values of sugar on growing microbial protein. For example, Dr. Mike Van Amburgh mentioned that feeding sugar increases the population of protozoa in addition to bacteria. Protozoa is overlooked in ration programs but evidence showed that protozoa contributes up to 20% of the microbial protein yield.
  
- 8. Feeding sugar and NPN urea to maximize components.** Supplementing NPN urea through QLF liquid feeds offers unique opportunity to optimize the efficiency of urea utilization and increase microbial yields. Because urea is much more affordable than soybean meal and bypass protein, feeding more urea through QLF liquid feeds and cutting back some other protein sources can reduce feed costs. Please note ration models cannot correctly predict this NPN and sugar interaction, and they also underestimate the role NPN plays in microbial protein synthesis even in the presence of dietary sugars. One has to watch the responses from the cows.
  
- 9. QLF products provide cost-effective energy and protein sources especially in today's market.** By feeding 4 lbs of QLF with 15% CP as-fed, one can replace 1.83 lbs as-fed ground corn and 1.03 lb as-fed soybean meal to achieve the same level energy and CP. In the presence of sugar, the addition of NPN can readily be converted into microbial protein to support components. In the real world, nutritionists would rebalance the ration by increasing forage feeding rate or cutting back some bypass protein, which would make feeding QLF even more economical.
  
- 10. Other benefits.** QLF is naturally rich in potassium, which helps support metabolic functions and milk fat production. QLF promotes fiber digestibility and reduces TMR sorting. QLF promotes energy intake and transition cow performance. QLF is consistent year-round and has no shrink. QLF products are excellent carriers for many nutrients and additives, such as vitamins, minerals, yeast culture, ionophores, etc., and ensure the excellent distribution of these expensive supplements.