TECHNICAL BULLETIN
DAIRY

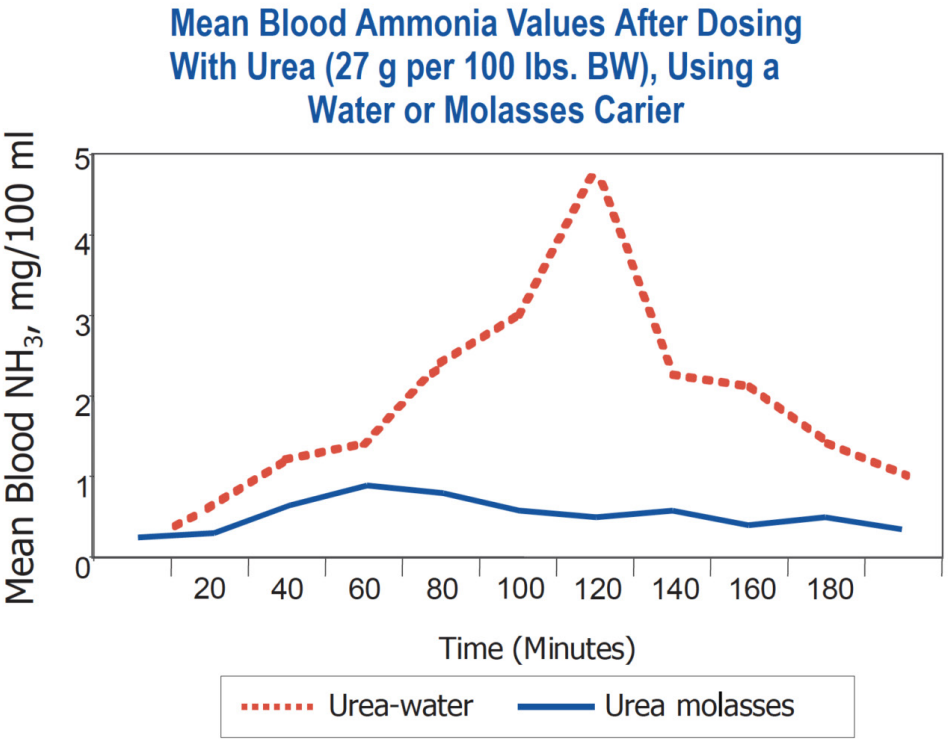
QLF QUALITY LIQUID FEEDS

FEEDING UREA THROUGH MOLASSES-BASED LIQUID FEEDS: THE MOST ECONOMICAL WAY TO MAXIMIZE MILK COMPONENTS

In today's competitive milk market, producers and nutritionists are trying to maximize milk components using the most economical dietary strategy. ***One of the best ways to achieve this goal is to maximize rumen microbial biomass,*** because **1)** increased short-chain fatty acids from feed fermentation by rumen microbes are important building blocks for milk fat synthesis; **2)** rumen microbial protein is the highest quality metabolizable protein with a desirable profile of amino acids, especially the most limiting amino acids, to optimize milk component production; **3)** more protein provided by rumen microbes allows us to reduce dietary protein supplementation and feed costs. Research showed that a group of cows consuming the same dry matter intake at 55 lb/d had rumen microbial protein yields range from 3.3 to 5.5 lb/d, indicating there is a great potential to improve microbial protein yields within a cow.

What are the advantages of feeding urea through molasses-based liquid feeds?

Urea is typically the most economical source of crude protein. The concept of synchronization between protein and carbohydrates in ruminants is known among nutritional professionals. Research shows that the rate of which urea is released matches up with the rate of sugar fermentation. In addition, research also found that on-farm milk component response from feeding urea together with molasses-based liquid feeds is superior to feeding dry urea alone or simply feeding molasses products without urea. This happens because when rumen microbes are exposed to a fast energy source like molasses sugar, they grow rapidly. When we provide microbes with quick a nitrogen source like urea, they



Lichtenwalner and McClain, 1978. Texas A&M University. Feed Management 36-40.

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can efficiently assimilate the nitrogen and convert to microbial protein. In addition, research from Texas A&M University found that compared to ruminant animals dosed with urea using water as the carrier, animals dosed with urea using molasses as the carrier did not have spikes in blood ammonia levels. This result suggests that 1) ruminants can utilize urea much more efficiently in the presence of molasses; 2)the risk of overfeeding urea and increased blood ammonia is less when using molasses liquid feed as the carrier; 3) rumen microbes can use both urea and sugar efficiently together and maintain blood ammonia concentration.

How much urea should we feed?

How much urea can be added to the ration depends on a variety of factors such as protein and soluble protein contents from other ingredients, amounts, and types of carbohydrate sources, degradation rates of carbohydrate sources, etc. Field experience tells us ration formulation programs are oftentimes unable to accurately predict rumen ammonia concentrations due to the complex nature of feed and the difficulty of predicting a dynamic rumen system. The best way is to start with formulation software to make sure there is a sufficient amount of rumen-degradable protein (RDP) and rumen ammonia, watch the responses from cows and adjust accordingly. Generally speaking, QLF liquid supplements with 20% crude protein contain about 1 oz urea per pound of feed on an as-fed basis. Feeding 4 to 5 lbs of QLF products is recommended because sufficient amounts of sugar (at least 6 to 7% of diet DM) and urea are needed to jumpstart rumen bugs and change the rumen fermentation dynamics. To maximize responses, amounts of dietary urea amounts need to match up with the amounts of sugar: the more sugar in the ration, the more urea is needed. After dietary changes, MUN (milk urea nitrogen) may fluctuate in the next few days but should stabilize over time. The target for the stability of MUN is around 12 to 13. Keep in mind our goal is not to shoot for the lowest MUN to starve the rumen and maximize nitrogen efficiency, our goal is to maximize dairy profitability by providing sufficient nitrogen and carbohydrates to grow rumen microbial protein. From an economic standpoint, because urea is much more affordable than soybean meal, bypass protein, and supplemental amino acids, feeding more urea through QLF molasses-based liquid feeds and cutting back some other protein sources can reduce feed costs.

Summary

Overall, optimizing the production of metabolizable protein from rumen microbes is the most economical way to drive milk components. This requires the proper balance of sugars, nitrogen, and other sources of carbohydrates and protein. Supplementing urea through QLF liquid feeds not only minimizes the safety concerns of feeding urea but also offers a unique opportunity to optimize the efficiency of urea utilization and reduce feed costs. QLF has the expertise of properly hydrating and suspending urea in liquid feeds, and manufacturing high-quality custom products to tailor to the ration of each individual farm. By working with nutritionists and implementing these findings into the feeding strategy, many producers have had great success in increasing milk components and on-farm profitability.