

# TECHNICAL BULLETIN

## DAIRY



### USING QLF LIQUID SUPPLEMENTS TO IMPROVE MILK PERFORMANCE AND PROFITABILITY

Increased level of dietary sugar is known to improve dairy cow performance. To evaluate the level of sugar on cow performance, a recent meta-analysis containing data from 24 published research papers (97 lactating diets) was conducted (de Ondarza et al. 2017. Professional Animal Scientist. 33: 700-707). Multiple dietary factors, including starch, soluble fiber, protein, and NDF, all influence dairy cow response to feeding additional dietary sugar. Fat-corrected milk yield and milk protein yield had the greatest response when the diet contained 5 to 7% (of DM) additional dietary sugar. This would equate to 6.75 to 8% (% of DM) total dietary sugar.

Feeding 4-6 lbs of molasses-based liquid feeds delivers needed levels of supplemental sugar to increase productivity. For instance, providing 5.8 lbs of molasses-based liquid feed increased ECM (+7 lb/d), milk fat (+0.28 lb/d), and milk protein (+0.19 lb/d) (DeVries & Gill, 2012). Several studies utilized in the meta analysis showed that approximately 7% total sugar in the diet DM provides a “sweet spot” for enhancing benefits to lactating cows:

- Increased NDF & ADF Digestibility (Broderick & Radloff, 2004; Broderick et al., 2008)
- Maximized yield of FCM (+6.8 lb/d) and fat (+0.4 lb/d) (Broderick et. al., 2008)
- Optimal milk protein content at 7.2% dietary sugar (Broderick & Radloff, 2004)

In the meta-analysis, higher producing cows had greater responses to dietary sugar ( $P < 0.0001$ ). With 5 to 7% added dietary sugar (% of DM), cows producing > 73 lbs of milk/d increased 3.5% FCM by 4.7 lbs/d (83.1 vs. 87.8 lbs/d). In comparison, cows producing < 73 lbs of milk/d increased 3.5% FCM by 1.7 lbs/d. Likewise, when 5-7% sugar was added to the diet, cows producing >73 lbs of milk/d increased milk true protein production ( $P < 0.0001$ ) by 0.2 lb/d, compared to 0.1 lb/day increase for cows producing <73 lbs of milk/d. The meta-analysis indicated that greatest responses to supplemental sugar occur in the first 165 DIM.

For optimal yield response of 3.5% FCM when supplemental sugar is fed, it is recommended to feed a diet with low to moderate starch (22 – 27% of diet DM) and moderate to high soluble fiber (6.0 – 8.5% of diet DM). Response to molasses-based liquid supplements was optimized when the following ration guidelines were used when formulating lactating cow diets (Table 1).

**Table 1. Lactating Dairy Cow Ration Guidelines When Using QLF Liquid Supplements.**

Dietary Guidelines	Optimal Range
Total sugar % of diet DM	6.5 to 8.5
CP, % of diet DM	16.5 to 17.5
Supplemental sugar, lbs	1.5 to 2.5
RDP, % of diet DM	10 to 11.5
Soluble protein, % of CP	38 to 45
NDF, % of DM	28 to 35
Forage NDF, % of DM	20 to 23
Starch, % of DM	22 to 27
Total starch + sugar, % of DM	30 to 35

**Table 2. Economic analysis based on meta-analysis research for herds producing > 73 lbs/cow/d.**

Expected increase in 3.5% FCM yield lbs/cow	4.7
Expected increase in milk income using \$16/cwt milk, \$/cow	0.75
Additional cost for liquid supplements, \$/cow	0.2
Costs for increased DMI at 10 cents/lb	0.25
Net IOFC per cow, \$/day	0.30

