FIELD STUDIES ADDING OF DL-METHIONINE HYDROXY ANALOGUE CALCIUM TO LACTATING COW RATIONS

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TAKE HOME MESSAGES

- The addition of dl-methionine hydroxy analogue calcium (HMTBa) to diets in four commercial herds increased milk production by four pounds of milk per day.

- The economic benefit to cost ratio was 5 to 1.

The addition of amino acids can improve milk yield and components. Four high producing commercial dairy herds were selected (one herd in Minnesota, one herd in Wisconsin, and two herds in Illinois with 1400, 1250, 150, and 70 lactating cows, respectively). The HMTBa supplement (MFP, trade name marketed by Novus International) was added to trace mineral premixes or directly into dairy protein supplements to supply 25 grams per head per day for lactating cows.

EXPERIMENTAL DESIGN

The design of the field trials included a pre-treatment period (PRE), a treatment period (HMTBa), and a post-treatment period (POST) consisting of 90 days. The pre-treatment period production data were obtained in early to mid-October, 2005, to early to mid-January of 2006. Treatments started in early to mid-January and ended approximately 90 days later in early to mid-April. The post-treatment period ended in early to mid-June before summer heat and forage changes could impact milk performance. Dairy records were obtained from the farms using Dairy Comp 305 or PCDart software. After initial retrieval of production data, a data set was created with the following constraints.

1) Cows that had at least one measurement for milk, protein percent, and fat percent prior to supplementing (PRE)

2) Cows that had at least one measurement for milk, protein percent, and fat percent during supplementation (HMTBa period)

3) Cows that had at least one measurement for milk, protein percent, and fat percent after supplementation was removed from ration (POST)

If a cow had more than one measurement for PRE and POST periods, a maximum of two months of data were averaged for that cow. All measurements obtained during the HMTBa period were averaged across the entire duration of supplementation for each cow. Any cows that did not meet all of the criteria were removed from the analysis. This resulted in 1005 lactating cows in
Dairy A, 782 in Dairy B, 119 cows in Dairy C, and 32 in Dairy D with average days in milk (DIM) for the PRE period averaging 155, 122, 143, and 91 days, respectively.

Milk production, 3.5 % fat-corrected milk, milk fat percentage and yield, and milk protein percentage and yield were measured. The SAS statistical software package was used to statistically evaluate treatment differences between periods. Due to a normal milk persistency, PRE and POST treatment periods were averaged to minimize the impact of persistency. Treatment data were compared to periods without supplementation to test for differences. Data were analyzed “within farm” and “across farms”.

Diets were corn silage, corn and soy-based. However, some variation in the types of regionally available byproducts used in formulation of high cow diets occurred (diets available on request). Samples of TMR’s and protein supplements were taken during the treatment period. Supplements were analyzed for verification of the 25 gram feeding rate of HMTBa and NIR analysis of the TMR were used to compare analyzed nutrient profiles to ration printouts supplied by consulting nutritionists (ration printouts and NIR analyses are available).

**RESULTS**

When the data were analyzed across all four dairies, cows receiving HMTBa produced an additional 4 pounds of milk ($P = 0.01$) over the baseline created between the PRE and POST periods during which no supplementation was given (Figure 1). Also, there was a highly significant increase in milk protein yield with an additional 0.114 pound of protein ($P < 0.01$) was produced when cows were fed HMTBa (Figure 2). Milk fat yield response showed a numerical increase (statistically non-significant).

Reviewing the results from the individual farms, milk yield significantly increased ($P < 0.05$) with HMTBa supplementation, ranging from 2.4 to 5.8 pounds more milk (Figure 3). The treatment effect of HMTBa on milk yield was statistically more significant for herds with larger cow numbers (Dairies A and B). However, the milk response attributed to HMTBa supplementation was significant for Dairies C and D. Milk protein yield increased within each herd, from 0.06 to 0.18 pound. Milk fat yields were more variable.

For a 9 to 11 cent investment and $12.00 milk, supplementing, HMTBa yielding a 5:1 benefit to cost ratio based on milk yield in this study. Supplementing lactating dairy cows with HMTBa produced an economical return.
Figure 1. Milk Production for HMTBa vs. Control Across All Dairies

Treatment Difference $P < 0.05$

Figure 2. Milk Protein Yield for HMTBa vs. Control Across All Dairies

Treatment Difference $P < 0.01$

Figure 3. Milk Production by Dairy

Dairy A  Dairy B  Dairy C  Dairy D