

# Research Notes

Arm & Hammer Animal Nutrition



## DCAD Plus Quickly Boosts Milk Fat Even When Cows are Fed a High-Fat Diet.

### STUDY OVERVIEW

- This trial<sup>1</sup> was designed to investigate how quickly milk fat production levels would change when potassium carbonate sesquihydrate (DCAD Plus™) was abruptly added to the diet.
- 10 early lactation cows were used as part of a 42-day trial and fed diets as follows:
  - **Period 1: Day 0 – Day 7**
    - All cows were fed the control diet, which was formulated for a DCAD of +37.7 with potassium (K) at 1.74% DM. The diet included 5.7% DM long-chain fatty acids, which included 1.8% as soybean oil to put a downward pressure on milk fat production.
  - **Period 2: Day 8 – Day 28**
    - 5 cows remained on the control diet
    - 5 cows were fed the control diet plus DCAD Plus at a rate of 2.33% DM potassium to achieve a DCAD of +54.3.
  - **Period 3: Day 29 – Day 42**
    - All cows were fed the control diet
- Milk and component production were measured on a daily basis. Additional milk samples were captured to analyze milk fatty acid composition.

### RESULTS

- From Period 1 to Period 2, milk fat production dropped in the control group while at the same time, cows in the treatment group increased milk fat production, as shown in Figure 1.
- The change in milk fat concentration was detectable and significant within the first 3 days of Period 2 ( $P < 0.05$ ).
- In the treatment group milk fat production continued to be greater in Period 3 even after DCAD Plus was no longer fed.
- Energy-Corrected Milk (ECM) decreased in the control diet from the start to the end of the trial, while it increased throughout the phases in the treatment group, as shown in Figure 2.

FIGURE 1: Milk Fat Production

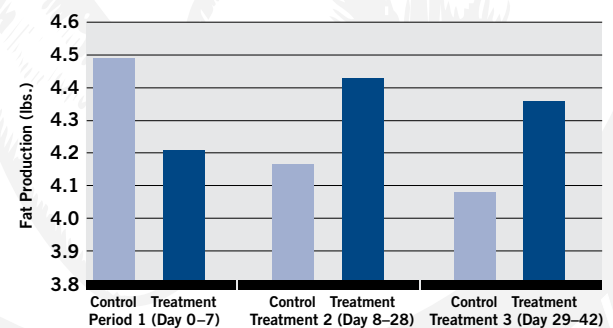
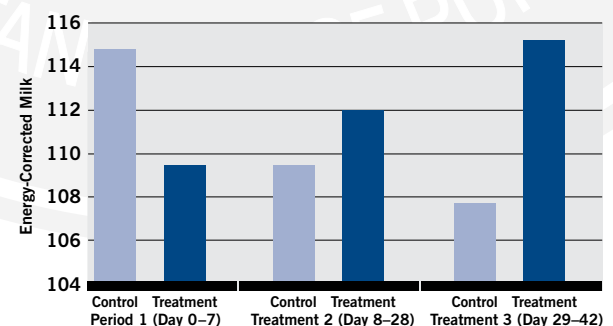


FIGURE 2: Energy-Corrected Milk

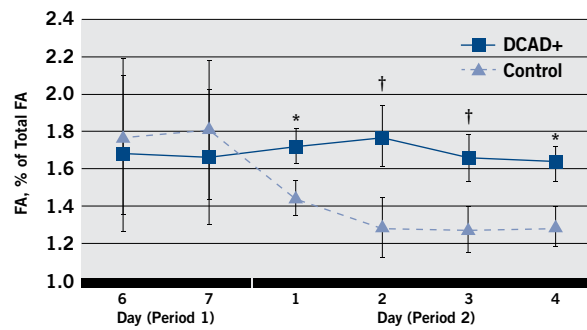


- No differences were seen between groups related to dry matter intake, milk protein concentration or milk protein yield.
- DCAD Plus™ supplementation resulted in greater C18:1 *trans*-11 by 23% (Figure 3) and less C16:1 by 15.4% ( $P=0.04$ ). These results support the hypothesis that feeding DCAD Plus can help promote the normal (*trans*-11) biohydrogenation pathway.

## CONCLUSIONS

- Feeding DCAD Plus resulted in greater milk fat production within 72 hours of supplementation, even when cows were fed a diet that was intended to put downward pressure on milk fat production.
- In the treatment group, milk fat production and ECM did not return to control levels in Period 3, even when DCAD Plus was no longer fed.
- The differences seen in milk fat concentration were associated with a greater concentration on C18:1 *trans*-11, suggesting DCAD Plus mediates a shift in biohydrogenation of 18:2 in the rumen.

**FIGURE 3:** Concentration of C18:1, *trans*-11 fatty acid (FA) in milk across Periods 1 and 2.



† $P<0.10$ , \* $P<0.05$



### Animal Nutrition

1 Guiling M, Harrison JH, Block E, Jenkins TC, VanWieringen L. Short communication: Temporal effect of feeding potassium carbonate sesquihydrate on milk fat in lactating dairy cows fed a fat-depressing diet. *J Dairy Sci* 2016;100:371–378.

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