

CONSULTANT'S DIGEST

Making Milk But Losing Body Condition? Is Your Fat Supplement To Blame?

Dairy producers striving to supply more energy in their lactating-cow rations often rely on fat supplements to give cows that extra boost. Feeding an inappropriate fat supplement may mean sacrificing body condition due to depressed feed intake.

In the most comprehensive studies of fatty acid supplements ever done with lactating dairy cows, Dr. Mike Allen of Michigan State and graduate student Kevin Harvatine evaluated saturated free fatty acids (Energy Booster 100[®]) and calcium soaps of long chain fatty acids (MGL [MEGALAC[®]] and MGL-R [MEGALAC-R[®]]) in production and digestion/metabolism trials. Their findings add to the growing body of evidence that calcium soaps depress feed intake.

In both sets of studies, TMR diets were formulated to be equivalent in fatty acid content.



High NEFA levels coupled with decreased intake and steady milk production indicates mobilization of body fat.

The digestion/metabolism study² included lactating cows fitted with rumen and small intestine cannulas for measuring intake, ruminal changes, intestinal absorption, and overall digestibility of fatty acids. Treatment diets contained equal fatty acid levels from Energy Booster 100[®], MGL-R, and a 50:50 blend of Energy Booster 100[®] and MGL-R.

The researchers reported that rumen microbes biohydrogenated large portions of the unsaturated fatty acids in MGL-R to saturated fatty acids—what the cow's system naturally prefers. However, this biohydrogenation was not enough to prevent intake and rumination depression (P<0.01) and decreased (P<0.01) milk production, milk fat, and milk lactose percent. The biohydrogenation process of unsaturated fatty acids often produces intermediates—potent milk fat depressants.

Production Study	Energy Booster 100 [®]	MGL
Dry matter intake, lb/day**	60.3	58.8
Rumination time, minutes/day**	535	510
CCK, pmol/L*	12.5	14.1
Insulin, IU/ml***	12.8	10.1
NEFA, μM***	89.3	115.5

*Values differed by P<0.10 **Values differed by P<0.01

*** Values differed by P<0.001

In the production study¹ of mid-lactation cows averaging 96 pounds of milk, the researchers monitored intake and rumination time as well as tested blood samples over two-week periods for cows fed Energy Booster 100[®] and MGL. Results show that the MGL-fed group had lower milk protein percent and milk lactose percent (P<0.05) than the Energy Booster 100[®] group. While the two groups did not differ in milk production or milk fat percent, cows fed MGL decreased their dry matter intake. Consistent with the reduced intake is the lower insulin level and decreased rumination time. The MGL group also had a higher level of CCK, a hormone associated with decreased intake. The most startling numbers are the higher NEFA among MGL-fed cows, indicating that these mid-lactation cows were mobilizing body condition—a consequence of their lower intake, which explains why they were able to hold milk production.

Digestion – Metabolism Study	Energy Booster 100 [®]	Energy Booster 100 [®] :MGL-R	MGL-R
Milk production, lb/day*	102.6	99.5	96.2
Fat, %*	2.93	2.78	2.43
Lactose, %*	4.90	4.83	4.83
Dry matter intake, lb/day*	56.6	55.3	53.1
Rumination time, minutes/day*	616	568	560

*Values differed by P<0.01

Fat Fast Facts

- MGL and MGL-R depressed dry matter intake.
- Depressed intake resulted in mobilization of body reserves to maintain milk production.
- Cows fed Energy Booster 100[®] had higher dry matter intake and production than cows fed MGL or MGL-R.

¹Reference production trial published in November 2005 J. Dairy Sci

²Reference digestion/metabolism trial: 4 articles published in March 2006 issues of the J. Dairy Sci. and J. Nutrition