

Fat Feeding Facts. 7
Fat Supplementation of Forage Levels in Early Lactation

Cows in early lactation undergo negative energy balance as established in **Fat Feeding Facts 6** *Energy Balance and Milk Production*. Unfortunately, there is a prevalent belief that fat supplementation in early lactation cannot be done without cows decreasing dry matter intake (DMI). But as we learned in **Fat Feeding Facts 4**, DMI is related to the amount of unsaturated fatty acids in a fat supplement which results in the extent of decreased DMI. To assess this situation, a study was done to evaluate cows' responses to a mostly saturated free fatty acid supplement (FS) during the early part of lactation. Also of major interest was whether these responses differed with forage levels of either 40 or 60% of DMI. The forage mix was composed of 2/3 corn silage and 1/3 alfalfa haylage in both 40 and 60% forage diets. Both first calf and older cows were used similar to the composition in most herds. Cows were allowed 2 weeks to adjust and recover after calving. Then there was a baseline period of another week before they were assigned to one of 4 treatments for the following 15 weeks. First, note in the table that DMI was not decreased with the addition of the fat supplement (average daily intake was 1.2 lb) within either forage treatment. The lower forage treatments did have greater DMI which reflects the fill and slower/lower digestibility of forages vs concentrates. But there were other differences within forage treatments. There is a theory that in early lactation when cows are in negative energy balance, they will give priority to replenishing lost body condition to some minimum set point before producing more milk. That appears to be what happened with the 60% forage treatments where the additional Mcal NEL intake with fat supplementation resulted in a significantly greater body condition gain during the 15-week study. But when 40% forage diets were fat supplemented, and body condition was replenished equally for both treatments, the additional energy was used to produce nearly 6 lb more milk in already high producing cows over the 15 week study.

| | 60% -FS | 60% +FS | 40% -FS | 40% +FS |
|-----------------------------|-------------------------|-------------------------|--------------------------|--------------------------|
| DMI, lb/d | 50.4 | 51.7 | 54.8 | 54.4 |
| NEL, Mcal/d | 35.5 | 38.5 | 38.0 | 40.5 |
| Body condition score | 2.71^a | 2.91^b | 2.89 | 2.89 |
| Milk, lb/d | 99.9 | 98.6 | 100.8^a | 106.5^b |

^{ab}Means within a forage treatment differ by P<0.05.

An analogy to cows' energy status and utilization is to think of cows as an energy "bank". Energy that goes into a cow's energy account can be stored as body condition (reserves), can be withdrawn for more milk production, can be utilized for reproduction, or used for some combination of these functions. Cows do not lie. And they cannot create energy. So energy intake and fat supplementation with a source that will not decrease DMI in early lactation is particularly critical.