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Transition Cow Program Not Working? – New Research May Provide Insight

The dairy industry has done a great job of breeding cows with the ability to produce large volumes of milk. However, many dairy producers believe metabolic challenges around the calving period have also increased. There is no question that how well cows adapt to the physiological changes that take place before, during and after calving is a very important factor in determining their productivity, health and, ultimately, profitability.

One of the primary areas of concern for the cow in transition is nutrition. And, one of the nutrients of concern is *energy*. Virtually overnight cows must adapt from a period where the energy requirement is low to a period where energy demand for milk production is high. For example, the energy requirement of a cow producing 55 lbs of 4% fat milk per day just two days *after* calving is about twice as high as just two days *before* she calves. That's a big change in energy demand within four days. The immune system of cows during this period is also depressed. Research by Dr. Jesse Goff at the USDA National Disease Center in Ames, Iowa, has shown that energy and protein deficit is a contributing factor to immune system suppression. For these reasons it is important that we minimize the energy deficit following calving.

Two key metabolic changes happen at calving in relation to the energy demand:

1. The cow's liver begins making tremendous amounts of glucose to meet the increased demand for milk lactose. Cows absorb very little glucose directly from the digestive tract so most of it must be synthesized in the liver.

2. The cow begins to mobilize large amounts of body fat called “non-esterified fatty acids” (NEFA) for energy. NEFA can be used by tissues for energy, used by the mammary gland to produce milk fat, or taken up by the liver. If more NEFA is taken up by the liver than it can metabolize, then it is partially metabolized and exported as ketone bodies (causing ketosis) or stored in the liver (causing fatty liver).

As a result of these two changes, it can be concluded that normal liver function must be maintained in order for cows to have a successful transition. Cows with fatty liver can lead to their downward spiral in the herd including the presence of ketosis, rapid body weight loss, complications with other diseases, decreased feed intake, decreased production, and an increased likelihood of leaving as a cull. These problems cause great frustration for producers. Even farms with diets that appear to be well-formulated and properly delivered to the bunk often have periods of time where the majority of cows struggle to make it through the transition period healthy.

Many of the close-up feeding recommendations have been based on some classic research studies done by Sandra Bertics at the University of Wisconsin in the early 1990’s. She used rumen cannulated cows and stuffed the feed refusals in the cannula to maintain high dry matter intake through calving. Results showed the force-fed cows had decreased liver fat, increased blood glucose levels and increased milk production as compared to the cows that weren’t stuffed. Based on this research, pre-fresh feeding programs evolved to focus on formulating diets to maximize dry matter intake in the close-up group. The most common method to achieve this has been to decrease fiber (increase grain) in the close-up ration. Several subsequent university trials have been

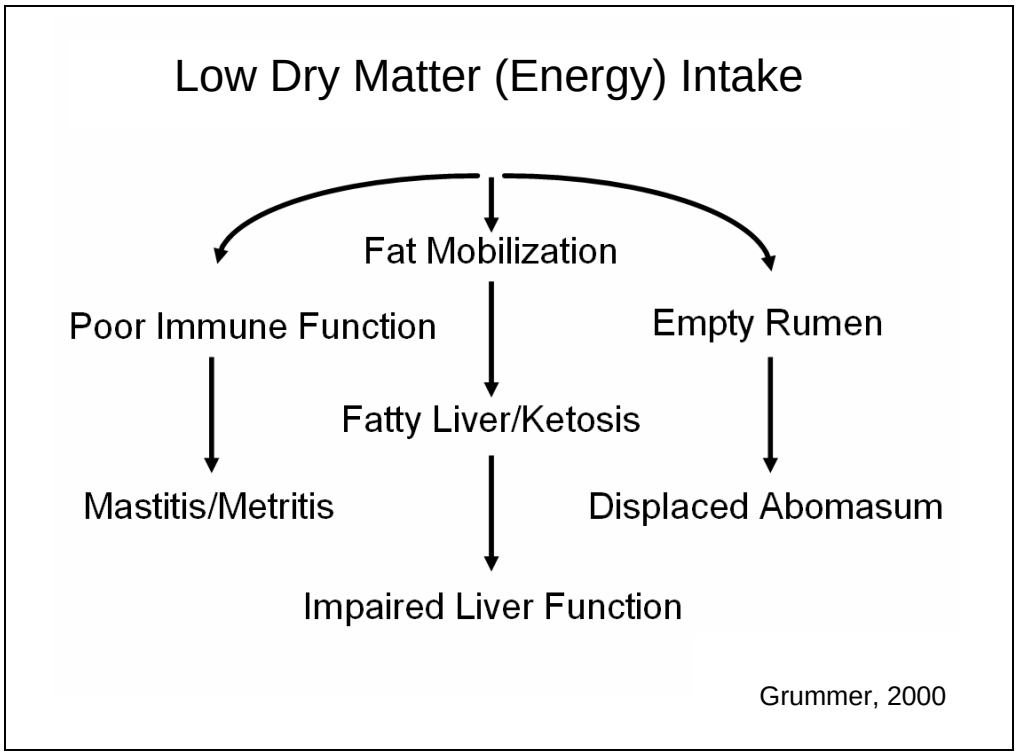
conducted on various schemes to maximize dry matter intake pre-calving. Even when treatment strategies resulted in increased intake during the close-up period, improvements in production and decreases in disease incidences have been disappointing. Similar results were heard from producers – sometimes these diets worked, sometimes they did not.

However, more recent research from University of Illinois scientist Dr. Jim Drackley may help to understand the reason for these inconsistent results. His research is showing that the average dry matter intake during the transition period may not be that important in minimizing health problems post calving. A more important factor in preventing disease seems to be how much a cow drops in intake the week *before* calving. His research also shows that energy intake in the far-off dry cow group has a big effect on dry matter intake as calving approaches. Cows fed high grain (energy) in far-off diets had greater decreases in intake as calving approached compared to low energy diets. Cows fed diets in excess of energy requirements during the far-off dry period developed typical problems you might see in fat cows, even if cows appear to be in proper body condition.

Another of Drackley's observations is that cows on these high energy diets are more likely to develop a disease called "type II" ketosis. This is a form of ketosis in which cows do not respond to treatment, are susceptible to other diseases, and have a high death rate caused by associated complications.

Minimizing stress during the periparturient period is another major factor in helping cows achieve a successful transition. Ways to minimize stress include: not overcrowding; providing a clean, dry, comfortable environment; minimizing vaccinations right around calving; and minimizing social group changes.

To learn more about the management and feeding of transition cows, you are invited to attend the Midwest Dairy Expo to be held at the St. Cloud Civic Center on November 30th and December 1st. Dr. Drackley will be present to discuss his latest research and how his findings can be applied in a practical manner on your farm. For further information visit the Expo web site at: http://www.mnmilk.org/convention.htm.



Improper energy intake can lead to an unhealthy transition period.