Alberta Dairy Management
PREPARED FOR AND DISTRIBUTED BY THE DAIRY EXTENSION ADVISORY GROUP

Getting Cows Bred

1. Preparing cows for high conception rates

The 1990 Alberta Agriculture dairy survey identified reproduction as the most commonly cited reason for culling. Next to mastitis and foot problems, silent heats were identified as the most common health concern. And based on Prairie DHI records, infertility accounts for 40% of all involuntary culling in the first three lactations. Clearly, getting cows bred is one of the most important constraints limiting production and profitability.

High conception rates require both a cow in a state of good reproductive fitness and a herdsman who can recognize her readiness for breeding and inseminate her correctly. This first of two articles will deal with getting cows 'fit' for breeding. The second will discuss heat detection and insemination.

Health disorders after calving

At the 1995 Western Canadian Dairy Seminar, Dr. Jack Britt presented data comparing the reproductive performance of cows in eight commercial herds that experienced no postpartum health problems with those that experienced minor or severe problems. Minor problems were those that could be treated by herd personnel. Severe problems required a veterinarian.

Cows in their second or later lactations that experienced severe problems :

- had a first service conception rate of 44% compared with 71% for their healthy herdmates;
- were culled for poor reproduction at a rate 4 times greater than cows with no problems.

Postpartum health problems are often interrelated with one disorder leading to another. These interrelationships are illustrated in table 1. For example, a difficult calving (dystocia) is often followed by retained placenta and uterine infection (metritis). Infection may produce fever and toxins resulting in lower feed intake and milk production, higher risk of displaced abomasum and increased loss of body condition.

All of these postpartum disorders ultimately lead to lower production, poor reproductive performance and reduced longevity in the herd.

Body condition loss

Even when cows do not encounter postpartum health problems, rapid body condition loss in early lactation can reduce reproductive efficiency. Typical relationships between feed intake, milk output, body weight and energy balance are shown in figure 1.

Energy balance is the difference between energy input (from feed and body reserves) and energy output (for milk production and tissue growth). In a cow with high production potential, milk output increases faster than feed intake after calving. If she is carrying a reasonable level of body reserves (see article **1C1**), fat mobilization can contribute a significant amount of energy to milk production. A decrease in condition score from 3.5 to 2.5 represents the mobilization of about 50 kg of body reserves, providing enough energy to support the production of about 350 kg of milk.

SECONDARY DISORDER	PRIMARY DISORDER					
	MILK FEVER	DYSTOCIA	RETAINED PLACENTA	METRITIS	DISPLACED ABOMASUM	KETOSIS
DYSTOCIA	X					
RET PLACENTA	X	X				
METRITIS	X	X	X			
DISP ABOMASUM	X	X	X			
MASTITIS	X	X	X	X		
LOW CONCEPTION	X	X	X	X	X	X

Table 1 : Primary disorders that lead to secondary disorders in postpartum cows.

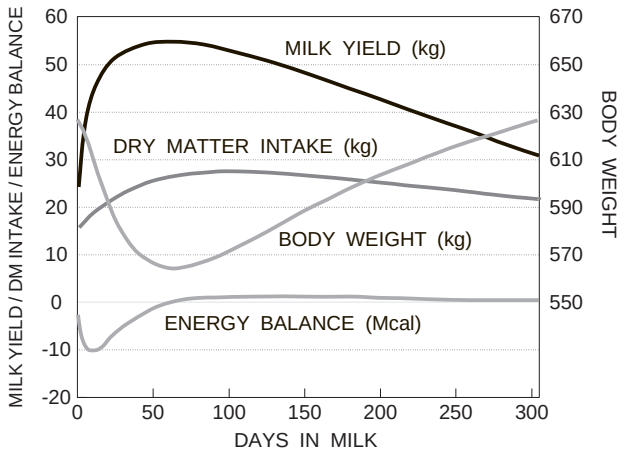

Figure 1 : Milk yield increases faster than dry matter intake after calving. Production is supported by body energy reserves resulting in negative energy balance.

Target condition score for cows at calving is in the 3.25-3.75 range. Higher scores are detrimental since cows scoring 4 or more tend to eat less, lose more condition and lose it faster than lower scoring cows.

Researchers at Cornell University concluded that days to first ovulation were directly related to the average energy balance during the first 20 days of lactation. The more negative the energy balance in that period (the greater the loss in body condition score), the longer the days to first ovulation. Dr. Britt suggests that cows may also be less fertile after a period of negative energy balance due to abnormal development of ovulatory follicles (see article **2C1**).

Pre-calving management

Efforts aimed at minimizing weight loss in early lactation and reducing the incidence of postpartum disorders must be initiated well before calving. By routinely scoring body condition, the target score for cows at calving should be achieved 60 days earlier (see article **1C1**). In the last 60 days, feeding management should focus on the requirements of the growing fetus and preparation of the cow for the next lactation, including :

- antibiotic treatment of dry cows to reduce the incidence of early lactation mastitis. Supplemental selenium and vitamin E may also reduce the incidence and severity of mastitis in fresh cows.
- maintaining dry cow calcium intake in the 80-100 grams per day range. If anionic salts are fed, calcium intake must be greater than 135 grams per day. Low blood calcium (hypocalcemia) is the cause of milk fever and has been implicated in retained placenta and displaced abomasum (see article **1M1**).
- ensuring adequate prepartum intakes of trace minerals and vitamins. This is best achieved by feeding these with a few pounds of grain as a delivery vehicle rather than assuming adequate intakes from free-choice mineral consumption.
- increasing ration nutrient density in the close-up period (last 2-3 weeks) to compensate for a possible 20-30% feed intake reduction in the last week to 10 days before calving. Inadequate nutrient intake at this time can result in mobilization of body fat and protein reserves leading to metabolic disorders.
- introducing components of the early lactation ration in the close-up period. This provides a smooth transition between the dry cow and lactation rations, increasing postpartum intake and reducing the risk of displaced abomasum.

Post-calving management

A cow that loses condition rapidly after calving often fails to conceive until well after 120 days in milk, resulting in a long lactation, a high condition score at next calving, rapid postpartum weight loss and another long breeding interval. To break this cycle, it has been suggested that these cows could be bred at the first or second heat after calving. Since it takes 80 to 100 days for a follicle to develop to ovulatory size, follicles that ovulate at the first two heats have experienced most of their development during the previous dry period when nutritional stress should have been minimal. The third and subsequent follicles develop in the adverse environment of negative energy balance.

The only practical means of reducing condition loss in early lactation is to increase energy intake. Since energy intake is the product of ration dry matter intake and ration energy concentration, efforts should be made to maximize both. Strategies to increase dry matter intake are discussed in article **1I1**. Ration energy concentration can only be increased to the extent that intake and digestive function are not compromised. Buffers (article **1B1**) and dietary fats (article **1F1**) are useful in achieving this goal.

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