

Factors Influencing Dairy Cow Reproductive Efficiency

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The goal of maintaining herd pregnancy rates in current production systems is a challenge due to large herds, confinement systems that are not necessarily conducive to heat detection, cow identification and implementation of nutritional management systems that meet individual cow requirements during both the transition and lactation periods.

An ovulation synchronization and timed insemination program like Ovsynch was developed to eliminate reliance on detection of natural heat. However, it is imperative that the producer and the veterinarian have a thorough understanding of the principles of ovarian manipulation in order to understand how the system functions when they make herd management decisions to implement the program. Implementation of the Ovsynch program is not successful unless the lactating dairy cows are cycling and the protocol is initiated at the appropriate stage of the estrous cycle. A presynchronization program involving PGF_{2a} can manipulate the timing of the estrous cycle to improve the success of the Ovsynch program. Use of the pre-synchronization program with the Ovsynch program can improve pregnancy rates to 48% from 36% with no pre-synchronization program. A new program, Heat Synch, involves the strategic use of ECP to induce ovulation as part of a timed insemination program.

Anestrous is a significant component of poor fertility rates. In our study of 499 cows in which blood progesterone levels were measured prior to initiation of the Ovsynch protocol, 23% had not started to cycle by 63 days postpartum. First calf heifers had a higher frequency of anestrous than multiparous cows. Pregnancy rates to Ovsynch were 22.4% for anestrous cows versus 41.7% pregnancy rate at 74 days after insemination of cycling cows. Efforts to maximize cow health, comfort and nutritional status following parturition will be reflected in lactation, higher numbers of cycling cows and improved reproductive performance.

Concern that low body condition score (BCS) adversely affects the Ovsynch program has been confirmed in our field trials. Cattle with BCS less than 2.5 had lower pregnancy rates at days 27 and 45 after insemination than those with BCS of 2.5 or greater. Based on these results, the economic impact of low BCS (<2.5) was predicted by dynamic modeling. There was a difference in net revenue of \$10.33 per cow per year as to whether 10% versus 30% of the herd had low body condition scores at the time the Ovsynch program was initiated. Thus, it is essential that producers try to nutritionally manage the dynamics of body condition postpartum to optimize fertility rates.

Also in our field studies use of bST treatment in a Presynchronization/Ovsynch program for first service increased first-service pregnancy rates to the Ovsynch protocol. The beneficial effect of bST is probably due to enhancement of early embryonic development.