



Relationship Between Milk Production and Fertility in Bovines

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Reproductive disorders have been found to be a major reason for decreased reproductive efficiency in cattle. Infectious and non-infectious gynecological disorders can dramatically affect the reproductive efficiency of a cow. Several factors are known to affect production and reproductive performance of farm animals and it may not be feasible to diagnose satisfactorily reproductive performance by focusing on any one particular disorder or symptom because of the interrelationship of the predisposing factors. Such factors include managerial, environmental, metabolic and nutritional problems in addition to common reproductive disorders, which collectively interact and exert adverse influences on reproduction.

Genetic and management effects on milk production and fertility

Over the last 30 years, genetic selection for increased milk production has been very successful. While genetic selection criteria and climatic conditions, they all report a substantial decline in reproductive performance during the same period. In seasonal pasture-based systems of milk production, such as in Ireland and New Zealand, studies have reported conception rates to first service between 39 and 52% (Dillon et al., 2006; Macdonald et al., 2008). In US and UK feedlot systems of milk production, conception rates to first service as low as 30–40% have also been reported (Pryce et al., 2004).

Negative energy balance and Body weight

Events in the post-partum period are influenced by pre partum management, most notably nutritional management (Overton and Waldron, 2004; Roche, 2006). Poor nutrition during the prepartum period can lead to a cow at calving that is more susceptible to increased metabolic disorders, body condition score (BCS) loss and a more severe negative energy balance. Negative energy balance (NEB) usually occurs in high-yielding dairy cows in early lactation when their energy expenditure is greater than their energy intake. NEB affects a number of physiological functions and especially reproductive performance



of dairy cows after parturition. A relationship exists between BCS, relative body weight (BW) changes in maximum NEB, and the reduced reproductive performance of cows. Cattle breeds specialized for milk production have a greater ability to mobilize body reserves than dual-purpose breeds. Therefore, they lose more BW, and the resulting NEB is associated with fertility and health problems.

- BW changes are also affected by the parity of cows. Higher-parity dairy cows lose more BW in early lactation
- Older cows in early lactation suffered a longer period in NEB and lost more BW.

Possibilities to counter infertility

Understanding genotype by environment interactions is crucial in determining the best health and management practices to achieve high levels of productive and reproductive efficiency. Demands of high milk production negatively impact a number of physiological pathways to reduce the likelihood of the concomitant establishment of pregnancy and that changes in management practices may go a long way to providing solutions to poor fertility in high producing cows.

Monitoring body condition score pre- and postpartum as an aid to nutritional and management decisions in order to ensure a mild, but not severe NEB occurs early postpartum and to minimise its carry-over effects into the remainder of the lactation. It is also important to note that partitioning of nutrients is under genetic control; hence different nutritional and management strategies are required for individual animals.

References

- Overton, T.R., Waldron, M.R., 2004. Nutritional management of transition dairy cows: strategies to optimize metabolic health. *J. Dairy Sci.* 87, E105–E119.
- Roche, J.F., 2006. The effect of nutritional management of the dairy cow on reproductive efficiency. *Anim. Reprod. Sci.* 96, 282–296.
- Dillon, P., Berry, D.P., Evans, R.D., Buckley, F., Horan, B., 2006. Consequences of genetic selection for increased milk production in European seasonal pasture based systems of milk production. *Livest. Sci.* 99, 141–158.
- Macdonald, K.A., Verkerk, G.A., Thorrold, B.S., Pryce, J.E., Penno, J.W., McNaughton, L.R., Burton, L.J., Lancaster, J.A.S., Williamson, J.H., Holmes, C.W., 2008. A comparison of three strains of Holstein-Friesian grazed on pasture and managed under different feed allowances. *J. Dairy Sci.* 91, 1693–1707.
- Pryce, J.E., Royal, M.D., Garnsworthy, P.C., Mao, I.L., 2004. Fertility in the high-producing dairy cow. *Livest. Prod. Sci.* 86, 125–135.

