No of Session: M4.18

Effects of Short Dry Periods on Health Status in Dairy Cattle

A. Pezeshki[1], H. R. Rahmani[1], G. R. Ghorbani[1], M. Alikhani[1] and M. Mohammadalipour[1], [1]Dept. of Animal Sciences, [1]College of Agriculture, Isfahan University of Technology (IUT), Isfahan, Iran 84156. Email: gghorbani@yahoo.com

ABSTRACT

Retrospective analyses of data from observations and limited results from designed experiments have supported an essential dry period of 40-60 days. In recent years few studies proposed 30 days dry period without any loss in milk yield of next lactation. There are few reports about the effects of shortening dry periods on health status of dairy cows. Objective of current study was evaluating the effects of different dry periods on health status of Holsteins. Treatments were arranged in a 3 × 2 factorial design that included; Dry period (1- Traditional (T) dry period (56 day) 2- Moderate (M) dry period (42 day) and 3- Short (S) dry period (35 day)) and milk yield (yield ≥ 20 and yield < 20). Metabolic disorders were recorded throughout the experiment and milk samples were collected weekly for 8 weeks of lactation and analyzed for SCC yield. The results of this study indicated that short dry periods has not affected incidence of dystocia, retained placenta, displaced abomasums, milk fever and mastitis. However, there may be higher risk for clinical mastitis incidence and lower reproductive efficiency due to shorter dry periods.

INTRODUCTION

It is well established that an optimal dry period length is about 4-7 weeks (Klein and Woodward, 1943; Wilton et al., 1967; Coppock et al., 1974; Funck et al., 1987; Sørensen and Enevoldsen, 1991; Makuza and Mcdaniel, 1996). The most of data is from retrospective studies with using DHI records, without randomized assignments of cows to different dry periods. In recent years, milk production per cow has increased because of the genetic and management improvements. Thus reevaluating the dry period length is necessary in today's high-producing cows. Few studies have conducted to evaluate the effects of short dry periods on performance of dairy cows and proposed 30 days dry period without milk loss in their next lactation (Rémond et al., 1997; Bachman, 2002; Bachman and Schairer, 2003; Gulay et al., 2003; Rastani et al., 2003; Annen et al., 2004). However, there are very few reports about the effects of dry period length on health status of cows. One of the factors which might be affected in relation with shortening dry period is Somatic Cell Count (SCC), which is high in the initiation of lactation period, and then it is declined during the peak and mid-lactation and gradually increases till late lactation in traditional dry periods (Peters, 2002). One study believes SCC increases in the subsequent lactation in cows given shorter or omitting dry periods (Ŕemond et al., 1997). It is speculated that because of the lack of enough time to antibiotic therapy in shorter dry periods, there may be a higher risk of mastitis for cows given short dry periods.

Mammary infections could be one of the risk factors affecting incidence of metabolic disorders in early lactation. Objective of the present study was evaluating the effects of different dry periods (56 d, 42 d and 56 d) on incidence of metabolic disorders and Health status of Holsteins.

MATERIALS AND METHODS

One-hundred twenty Holstein dairy cows were assigned to evaluating the effects of shortened dry period on health status of cows. Treatments were arranged in a 3 × 2 factorial design that included: Dry period (1- Traditional (T) dry period (56 day) 2- Moderate (M) dry period (42 day) and 3- Short (S) dry period (35 day)) and milk yield (yield ≥ 20 and yield < 20). Twelve cows were removed from the experiment for unexpected reasons and a total of one-hundred eight cows were included for statistical analyses. Metabolic disorders were recorded by herd sons and herd veterinarians throughout the experiment. Milk samples were collected weekly until 8 weeks of lactation and analyzed for SCC yield. Data was analyzed with PROC GENMOD of SAS with base of nonparametric statistics (v.8.2.SAS, 1999).

RESULTS AND DISCUSSIONS

Incidence of dystocia as showed in figure 1 was numerically greater in S group (11.4 %; 4/35) than T (8.57 %; 3/35), and M being in intermediate situation(10.52 %; 4/38). Retained placenta incidence as sowed in figure 2 inversely was higher in T (17.4 %; 6/35) than S (14.28 %; 5/35) or M (10.52 %; 4/38),. As indicated no significant differences were detected due to dry periods groups on incidence of dystocia and retained placenta. There were no differences between S and T groups on incidence of displaced abomasum and milk fever (2.8 % vs. 2.8 %; 1/35) as well. High-producing cows (yield ≥ 20 kg at drying-off) with 35 days dry period tended to increase milk Somatic Cell Score (SCS) compared with high-producing cows given 56 days dry (5.84 vs. 5.35; p = 0.11). Similarly, Ŕemond et al (1997) observed a tendency for higher SCC in cows given a shorter or omitted dry period. They reported that increase in SCC was not accompanied by clinical mastitis occurrence, while in our study S group had greater incidence of clinical mastitis (8.57 %; 3/35) than M (2.6 %; 1/38) or T (2.8 %; 1/35) at calving time (Figure 3). This result is adopted with initial theory for starting the experiment and there may be higher risk for incidence of clinical mastitis due to shortening the dry period. Of course, in the more recent study it has been determined the positive relationship between milk yield at drying-off and milk SCC in the next lactation (Rajala-Schultz et al., 2005). Thus because of the interaction between milk yield at drying-off and days dry, no absolute conclusion can be made from this data. Cows with higher SCC had greater days to first service than cows with a lower SCC, numerically (47.4 vs. 43.6, respectively) but it wasn't significant. Results indicated that reproductive efficiency could be affected by short dry periods and SCC of milk. More number of cows is needed for better evaluating of the effects of shortening dry periods on health status and their reproductive performance.

CONCLUSION

Health status is under the influence of unpredictable factors. But in this study in relation with shortening dry periods seems it is a risk factor which might effect this situation. There are few reports concerning the effects of short dry periods on health status of dairy cows for comparisson. The results of this study indicated that short dry periods has not affected incidence of dystocia, retained placenta, displaced abomasums, milk fever and mastitis, but greater numbers of cows would interfere the results. However because of tendency in high-producing cows with 35 days dry to elevated yields of SCC, there may be higher risk for clinical mastitis incidence and lower reproductive efficiency.

REFFERENCES

Annen, E. L., R. J. Collier, M. A. Mcguire, J. L. Vicini, J. M. Ballam, and M. J. Lormore. 2004. Effect of modified dry period lengths and bovine somatotropine on yield and composition of milk from dairy cows. J. Dairy Sci. 87:3746-3761.

Bachman, K. C. 2002. Milk production of dairy cows treated with estrogen at the onset of a short dry period. J. Dairy Sci. 85:797–803.

Bachman, K. C., and M. L. Schairer. 2003. Invited Rview: Bovine studies on optimal lengths of dry periods. J. Dairy Sci. 86:3027-3037

Coppock, C. E., R. W. Everett, R. P. Natzke, and H. R. Ainslie. 1974. Effect of dry period length on Holstein milk production and selected disorders at parturition. J. Dairy Sci. 57:712-718

Funck, D. A., A. E. Freeman, and P. J. Berger. 1987. Effects of previous days open on lactation yield. J. Dairy Sci. 70:2366-2373.

Gulay, M. S., M. J. Hayen, K. C. Bachman, T. Belloso, M. Liboni, and H. H. Head. 2003. Milk production and feed intake of Holstein cows given short (30-d) or normal (60-d)dry periods. J. Dairy Sci. 86:2030-2038.

Klein, J. W., and T. E. Woodward. 1943. Influence of length of dry period upon the quantity of milk produced in the subsequent lactation. J. Dairy Sci. 26:705-713.

Makuza, S. M., and B. T. Mcdanil. 1996. Effects days dry, previous days open, and current days open on milk yield of cows in Zimbabwe and North Carolina. J. Dairy Sci. 79:702-709.

Peters, R. R. 2002. Evaluating herd milk quality using DHI somatic cell counts. Pages 57–73 in Proceedings: Arizona Dairy Production Conference, Tucson.

Remond, B., J. Rouel, N. Pinson, and S. Jabet. 1997. An attempt to omit the dry period over three consecutive lactations in dairy cows. Ann. Zootech. 46:399-408.
Bachman, K. C. 2002. Milk production of dairy cows treated with estrogen at the onset of a short dry priod. J. Dairy Sci. 85:797-803.

Rastani, R. R., R. R. Grummer, S. J. Bertics, A. Gumen, M. C. Wiltbank, D. G. Mashek, and M. C. Rich. 2003. Effects of varying dry period length and prepartm diet on metabolic profiles and lactation or periparturient dairy cattle. J. Dairy Sci. 86:154. (Abstr.)

Rajala-Schultz. P. J., J. S. Hogan, and K. L. Smith. 2005. Short Communication: Association between milk yield at dry-off and probability of intramammary infections at calving**.** J. Dairy Sci. 88: 577-579.

Sorenson, J. T., and C. Enevoldsen. 1991. Effect of dry period length on milk production in subsequent lactation. J. Dairy Sci. 74:1277-1283.

Wilton, J. W., E. B. Burnside, and J. C. Rennine. 1967. The effect of days dry and days open on milk and butterfatproduction of Holstein-Friesian cattle. Can J. Anim. Sci. 47:85-90.

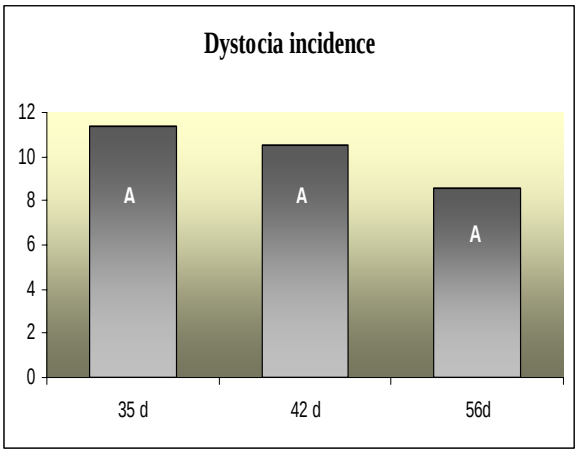

Figure 1. Incidence percent of dytocia in cows Given 35 d (35 days dry), 42 d (42 days dry) and 56 d (56 day dry) treatments.

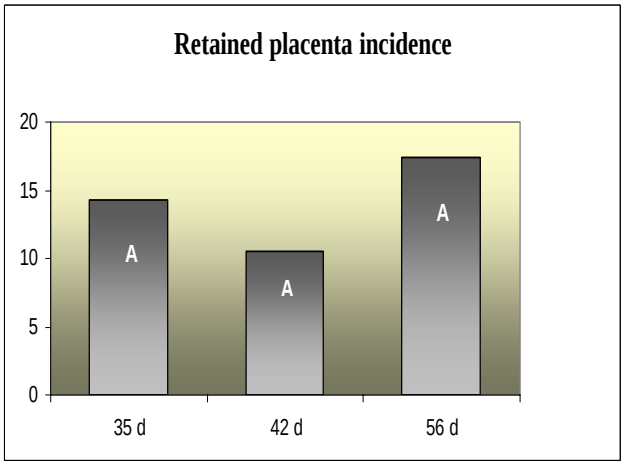

Figure 2. Incidence percent of retained placenta in cows given 35 d (35 days dry), 42 d (42 days dry) and 56 d (56 day dry) treatments.

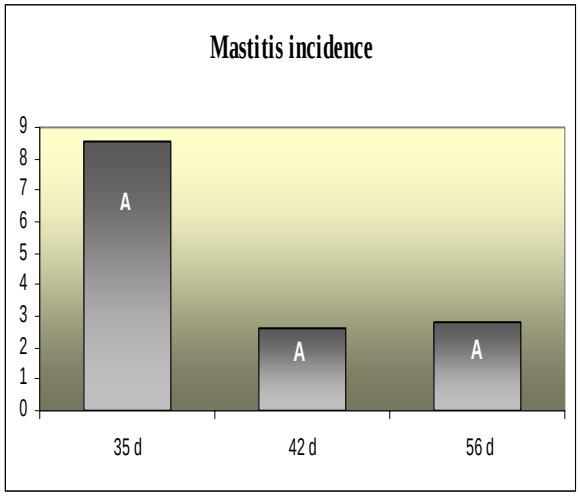

Figure 3. Incidence percent of mastitis in cows given 35 d (35 days dry), 42 d (42 days dry) and 56 d (56 day dry) treatments.