



## Effect of different dry period lengths on milk production and somatic cell count in subsequent lactations in commercial Dutch dairy herds

W. Steeneveld,\*<sup>1</sup> Y. H. Schukken,† A. T. M. van Knegsel,‡ and H. Hogeveen\*§

\*Chair Group, Business Economics, Wageningen University, 6706 KN, Wageningen, the Netherlands

†Quality Milk Production Services, Cornell University, Ithaca, NY 14853

‡Adaptation Physiology Group, Wageningen University, 6708 WD, Wageningen, the Netherlands

§Department of Farm Animal Health, Faculty of Veterinary Medicine, Utrecht University, 3584 CL, Utrecht, the Netherlands

### ABSTRACT

Shortening the dry period (DP) has been proposed as a management strategy to improve energy balance in early lactation. It is well known that both shortening and complete omission of the DP reduces milk production in the subsequent lactations. In most of these studies milk production data were obtained from planned animal experiments where cows were randomly assigned to DP length treatments, and cow management and diet composition did not differ among treatments. It may therefore be hypothesized that cows on commercial herds which apply a no-DP or short-DP-strategy, and support this by management adjustments, will have a less dramatic reduction in milk production. In this study, milk production and somatic cell count (SCC) following different DP lengths was investigated under commercial circumstances. Milk production of 342 cows (2,077 test-day records) was available from 5 Dutch commercial dairy herds which started a no DP-strategy for all cows. Test days of the year before applying the no-DP strategy are used as control (323 cows, 1,717 test-day records). Six other herds applied an individual cow approach and have different preplanned DP lengths within one herd. From these herds, information on 81 cows (482 test-day records) with a DP length between 0 and 20 d, 127 cows (925 test-day records) with a DP length between 21 and 35 d, and 143 cows (1,075 test-day records) with a DP length of more than 35 d was available. A generalized linear model incorporating an autoregressive covariance structure accounting for repeated test-day yields within cow was developed to estimate the daily yield (milk, fat and protein) and SCC of all cows. Applying no DP for all cows in the herd resulted in a reduction in postpartum milk production compared with within-herd control lactations (until 305 DIM) between 3.2 and 9.1 kg/d, which was a reduction of 12 and 32%, respectively. For the 6 herds

that applied an individual cow approach with different preplanned DP lengths, the cow-specific DP strategy was based on milk production and SCC approximately 2 mo before calving. Cows with a preplanned DP length ranging between 0 and 20 d had a reduction in postpartum milk production between 5.7 and 13 kg/d compared with cows with a DP length of >35 d. Cows with a preplanned DP length ranging from 21 to 35 d had a numerically lower milk production (between 0.6 and 5.3 kg/d) than cows with a preplanned DP length of >35 d, but this difference was significant in only one herd. When corrected for milk yield, no difference in postpartum SCC for cows with different DP lengths was found.

**Key words:** continuous milking, short dry period, milk production, dairy cow

### INTRODUCTION

Following parturition, high-producing dairy cows typically experience a negative energy balance (NEB). This NEB results from a quick increase in energy requirements for milk production while feed intake capacity in early lactation is limited. An NEB in early lactation is not only related to mobilization of body reserves and loss of BW, but also to an increase in incidence of metabolic disorders (Grummer, 1993), infectious diseases (Collard et al., 2000), and reduced fertility (Butler, 2003). Shortening the dry period (DP) has been proposed as a management strategy to improve energy balance in early lactation (Grummer and Rastani, 2004). It is well known that both shortening and complete omission of the DP reduces milk production in the subsequent lactations; continuous milking results in significant production losses (Andersen et al., 2005; Klusmeyer et al., 2009; Mantovani et al., 2010). When shortening the DP length, a decrease in milk production is often reported, but this decrease is not always significant (Gulay et al., 2003; Pezeshki et al., 2007; Santschi et al., 2011a). When cows with a DP of 4 wk were compared with a traditional DP of 8 wk, milk production losses ranged from 1 to 13%

Received October 22, 2012.

Accepted January 22, 2013.

<sup>1</sup>Corresponding author: [wilma.steeneveld@wur.nl](mailto:wilma.steeneveld@wur.nl)

(Annen et al., 2004; Pezeshki et al., 2007). When the DP was omitted, milk production losses amount up to 24% compared with cows with a DP of 8 wk (Andersen et al., 2005; Klusmeyer et al., 2009; Mantovani et al., 2010). From these studies it can be concluded that reducing DP length decreases milk yield in the subsequent lactations, though several remarks should be made related to this conclusion. First, in most studies omitting the DP increases milk protein content (Andersen et al., 2005; de Feu et al., 2009). Second, most studies only reported milk production effects during a restricted period postcalving (ranging from 35 to 294 DIM; Andersen et al., 2005; Klusmeyer et al., 2009). Third, the additional milk yield before calving was only reported in few studies (Rastani et al., 2005; Mantovani et al., 2010; Schlamberger et al., 2010). Fourth, the results on milk production were obtained on planned animal experiments on research herds where cows were randomly assigned to DP length treatments, and cow management and diet composition did not differ among treatments (Annen et al., 2004; Andersen et al., 2005). It can be hypothesized that, on commercial herds, farmers can apply an individual cow approach during the decision process of planning DP lengths, and take specific cow characteristics, such as milk production level, persistency, age, and SCC, into account. Furthermore, in practice, shortening or omitting the DP can be accompanied by other cow management and diet adjustments, which have not been studied in planned animal experiments on research herds until now. It may therefore be hypothesized that cows on commercial herds which apply a no-DP strategy and accompany this with management adjustments will have a less dramatic reduction in milk production.

The aim of this study is to evaluate production (kg of milk, fat, and protein) and SCC following different DP lengths under commercial circumstances. This study used data from commercial Dutch dairy herds who either started to apply the no-DP strategy for all cows (5 herds) or applied an individual cow approach, and thus have different preplanned DP lengths within one herd (6 herds).

## MATERIALS AND METHODS

### Herds

In 2010 an advertisement was placed in a Dutch farmers magazine seeking farmers to join a study group concerning the practical application of a no- or shorter-DP strategy. At the first meeting 32 farmers were present, ranging from farmers who are interested in applying a shorter- or no-DP strategy to farmers who have applied this strategy for years. Two months after the

meeting, farmers who actually apply no- or shorter-DP strategy were contacted. Only the farmers applying no DP quite recently ( $n = 5$ ) and the herds applying an individual cow approach with different preplanned DP lengths were selected ( $n = 6$ ) for data collection. Five herds (herds A–E) started between October 2010 and April 2011 voluntarily with an omission of the DP for all cows in their herd (no-DP strategy; Table 1). Six herds (herds F–K) voluntarily applied an individual cow approach and set different preplanned DP lengths ranging from 0 to 77 d within one herd. Decisions on the length of the DP on herds F through K were different between herds. On herd F, the intention was to give all cows a DP of 4 wk, but adjustments to this were made based on the milk production level of the cow approximately 2 mo before the expected calving date. On herds G, H, and K, only cows with high-milk production and low SCC approximately 2 mo before the expected calving date received a DP length less than 20 d; all other cows received DP lengths of at least 4 wk. On herds I and J, the level of milk production approximately 2 mo before the expected calving date was the criteria for the choice of the DP length. Herd size ranged from 46 to 160 cows; all cows were of mixed breed (herd A) or of the Holstein-Friesian breed (herds B–K). Cows were housed on a bedded pack (herd A) or in freestall barns with cubicles (herds B–K). Herds A and D were milking with an automatic milking system, the other herds were milking twice a day with a conventional milking system (except herd E, which milked 3 times a day). Herd C was fed a TMR, whereas the other herds fed a partial mixed ration and had an individual cow-accessed concentrate feeding system. The rations differed considerably between the herds, with varying amounts and ingredients. The amount of concentrates varied between a maximum of 5.5 (herd B) and 13 (herd A) kg per day. Individual cow milk yield and composition (fat, protein and SCC) was measured within a 4-, 5-, or 6-week interval. Data on milk recording and calving dates were obtained from the Dutch national milk recording system (CRV, Arnhem, the Netherlands). Dates of drying-off (or lack thereof) were provided by the farmers.

### Herds Eliminating DP for all Cows

**Data Editing.** From the 5 herds (A–E) that started the no-DP strategy, data from 443 lactations (parity  $\geq 2$ ) were available after the starting date until April 1, 2012. As only one lactation after a no-DP-strategy was analyzed, the second lactation of a cow after starting the no-DP strategy was excluded ( $n = 44$ ). Herd D stopped applying the no-DP strategy in November 2011, and therefore lactations started after Novem-

Download English Version:

<https://daneshyari.com/en/article/10978413>

Download Persian Version:

<https://daneshyari.com/article/10978413>

[Daneshyari.com](https://daneshyari.com)