THE POTENTIAL OF A SHORT OR NO DRY PERIOD IN DAIRY FARMING: EFFECTS ON UDDER HEALTH, METABOLIC HEALTH, AND LACTATION CURVE CHARACTERISTICS

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Shortening and omitting the dry period in dairy cows improves the energy balance, metabolic status and fertility in the subsequent lactation, compared with a conventional dry period of 6 to 8 weeks [1-3]. Improvement of the energy balance after a short or no dry period is due to a reduction in milk yield in the subsequent lactation [1], which is only partially compensated by additional milk in the precalving period [2]. In addition, cows without a DP not only produce less milk, but also can have an increased somatic cell count in the subsequent lactation [3] and an increased risk of over-fattening in mid and late lactation [4]. It can be hypothesized that a reduced dietary energy level and a more lipogenic, compared with a glucogenic ration can improve lactation persistency [5, 6], and herewith increase total milk yield and reduce the chance for fattening in mid and late lactation. Moreover, to our knowledge, all studies on the effect of dry period length (**DP**) on udder health were carried out using dry cow antibiotics at drying off [3]. Preventive use of dry cow antibiotics is not allowed in several European countries among which the Netherlands [7]. It can be hypothesized that the increased SCC due to omission of the dry period is due to omission of the dry cow antibiotics, and not due to omission of the dry period. The aim of the current project was to optimize a management system using a shortened or omitted dry period.

Holstein-Friesian cows (N = 128) were blocked for parity, expected milk yield and SCC in the previous lactation. At drying off cows were assigned randomly to 3 treatments: 1) a 30-d DP and a STD dietary energy level [**30-d DP(STD)**] (n = 44), 2) a 0-d DP with the same STD dietary energy level as cows with a 30-d DP and fed a G or L ration [**0-d DP(STD)**] (n = 44), 3) a 0-d DP with a LOW concentrate level and fed a G or L ration [**0-d DP(LOW)**] (n = 42). At week 7 in lactation, cows within each transition treatment were randomly assigned to 1 of the 2 lactation diets: glucogenic or a lipogenic diet. Lactating cows prepartum (0-d DP) and up to 7 weeks in lactation received a lactation ration that mainly consisted of grass silage and corn silage (6.4 MJ net energy NE_L/kg DM). The glucogenic ration consisted mainly of corn silage and grass silage (6.5 MJ NE_L/kg DM). The lipogenic ration consisted mainly of grass silage and sugar beet pulp (6.5 MJ NE_L/kg DM). The glucogenic and lipogenic ration with a LOW dietary energy level contained more wheat straw than the rations with a STD energy level (6.1 and 6.3 MJ NE_L/kg DM, respectively). Lactating cows received 1 kg/d of standard concentrate in the milking parlor. Experimental concentrate increased between 4 DIM and 28 DIM to 8.5 kg/day for cows receiving STD energy level (30-d DP(STD) and 0-d DP(STD)), and between 4 DIM and 22 DIM to 6.7 kg/day for cows receiving the LOW energy level (0-d DP(LOW)). The experimental concentrate decreased stepwise between 92 DIM and 211 DIM to 0.0 kg/day. Cows were monitored from 5 weeks prepartum till 44 weeks postpartum.

A 30-d DP without dry cow therapy, compared with a 0-d DP, tended to lower SCC and occurrence of clinical mastitis in the subsequent lactation. Moreover the average rise in SCC after omission of the DP was completely due to cows which had an elevation in SCC in the previous lactation. Additionally, occurrence of at least 1 elevation of SCC during the subsequent lactation after dry period length treatments did not differ among treatments. A 0-d DP reduced milk yield, and improved the EB and metabolic status of cows in early lactation, compared with a 30-d DP. Reducing the postpartum level of concentrate for cows with a 0-d DP did not affect FPCM yield or plasma FFA or BHB concentrations in early lactation, but did reduce EB in week 6 and 7 pp (Figure 1). Feeding a glucogenic ration, compared with a more lipogenic ration, improved energy intake and milk production, but did not affect EB. Based on findings from the current and previous experiment (8), a decision support model was made. This decision support model is the basis for a mobile application to support farmers in optimizing DP management for individual cows, including DP length and use of dry cow antibiotics. Variables in the mobile application include parity, history with ketosis or mastitis, last SCC and last daily milk production before the DP decision. Based on the current experiment, a 0-d DP is suitable for a selected group of cows with parity ≥3, no history of udder disease and high milk production in late lactation. A 30-d DP is suitable for a large group of cows as it improves EB in early lactation and has no negative effects regarding udder health, compared with a 60-d DP.

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Figure 1. Energy balance for cows with different DP lengths and dietary energy level (cows with a 0-d DP were fed a low [0-d DP(LOW)] energy level, based on their requirement for their expected milk yield, or a standard [0-d DP(STD)] level of concentrate that cows with a 30-d DP [30-d DP(STD)] received based on the requirement for their expected milk yield).