

22. Effect of voluntary waiting period on metabolism of dairy cows in different stages of lactation

E.E.A. Burgers^{1,2*}, R.M.A. Goselink², R.M. Bruckmaier³, J.J. Gross³, R. Jorritsma⁴, B. Kemp¹, A. Kok¹, A.H. van Ruitenbeek², A.T.M. van Knegsel¹

¹ Adaptation Physiology Group, and

² Wageningen Livestock Research, Wageningen University & Research, PO Box 338, 6700 AH Wageningen, the Netherlands

³ Veterinary Physiology, Vetsuisse Faculty, University of Bern, Bremgartenstrasse 109a, CH-3001 Bern, Switzerland

⁴ Department of Farm Animal Health, Ruminant Health Unit, Utrecht University, PO Box 80151, NL-3508 TD, Utrecht, The Netherlands

* Corresponding author: eline.burgers@wur.nl

During the transition around calving, dairy cows have an increased risk for diseases. An extended calving interval by extending the voluntary waiting period for first insemination after calving (VWP) reduces the frequency of these transitions. An extended VWP could be associated with altered metabolism, due to delayed gestation and more time in late lactation with lower milk production. Low milk production end lactation could be associated with increased body condition end lactation, which could increase the risk for diseases during the subsequent transition around calving. This study evaluated metabolism for individual cows with different VWP during different stages of lactation and during the subsequent transition around calving. Moreover, relations between cow characteristics before insemination and lactation performance were analyzed, to identify cows with lower risk for low milk production and increased body condition end lactation. Holstein-Friesian cows (N=153) were blocked and randomly assigned to a VWP of 50, 125, or 200 days (VWP50, VWP125, or VWP200), and followed from calving until 6 wk after subsequent calving. Weekly, from wk -2 until wk 6 around both calvings, serum samples were analyzed for non-esterified fatty acids (NEFA), β -hydroxybutyrate, glucose, insulin and insulin-like growth factor (IGF-1). During lactation, serum samples were analyzed for insulin and IGF-1 every 2 wk. Fat-and-protein-corrected milk (FPCM) and body weight (BW) gain were calculated weekly. Cows were divided in two parity classes (primiparous and multiparous). During gestation, multiparous cows in VWP200 had greater plasma insulin and IGF-1 concentration and lower FPCM compared with cows in VWP50 or VWP125, and greater BW gain compared with cows in VWP50 (3.6 vs 2.5 kg/wk). During gestation, primiparous cows in VWP125 had greater plasma insulin concentration compared with cows in VWP50, but the VWP did not affect body condition or FPCM. During the first 6 wk of the subsequent lactation, multiparous cows in VWP200 had greater plasma NEFA concentration compared with cows in VWP125 or VWP50 (0.41 vs 0.30 or 0.26 mmol/L). For primiparous cows, the VWP did not affect the metabolism, BW, or FPCM during the subsequent lactation. Independent of VWP, higher milk production and lower body condition before insemination was associated with higher FPCM and lower body condition end lactation. Variation in these characteristics among cows could call for an individual approach for extended VWP.

