

Positive long-term effect of increased days to conception on milk production during that lactation and the following lactation in Holstein dairy cows

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Introduction

Emphasis on early conception after calving has long been a target of the dairy industry as an important step for high productivity in dairy cattle. However, data show that average productive life of cows has been steadily declining, suggesting short calving intervals may be detrimental to long-term survivability and therefore animal well-being. The objectives of this study were to determine if cows that conceived early after calving did differ in long-term milk production and culling risk compared to cows that conceived later in a study encompassing 2 consecutive lactations.

Materials and methods

This was a retrospective study based on data collected at 6 dairy farms in the U.S. and Canada ranging in herd size between 300 and 3,000 milking cows. Milk production was automatically measured every milking, every day with milk meters that identified each cow based on a pedometer acting as RFID (afimilk®, Israel).

Cows with at least 150 days in their third lactation and no more than 7 lactations were eligible for the study. Milk production was added over the previous 2 lactations: the lactation when days to conception (DOPEN) were measured and the following lactation. Total production was then divided by the total days elapsed from the initial calving to the end of the next lactation, including days dry, to account for the possibility of an extended dry period in cows with late conception. To account for inter-cow and inter-herd variability in milk production, average milk production in the initial lactation for each cow and herd were included as independent variables, as well as lactation number, days dry and DOPEN in the following lactation. Data were analyzed by multiple regression, both using DOPEN as a continuous variable and in categories: early (< 90 DOPEN), average (90-120 DOPEN) or late conception (> 120 DOPEN). The outcome variable was average milk production throughout the 2 consecutive lactations. Logistic regression was performed to evaluate risk of culling in the following lactation.

Results

A total of 3,911 cows were enrolled in the study. Longer DOPEN resulted in higher overall milk production in 2 consecutive lactations. When evaluated in categories, cows with average DOPEN produced 0.90 ± 0.24 lbs/day of milk more than cows in the early DOPEN category, while cows with late conception produced 1.58 ± 0.23 lbs/day of milk more than cows in the early DOPEN category. This production is to be multiplied by the average length of 665 ± 85 days of production in 2 consecutive lactations (including days dry) to obtain the total effect.

When evaluated as a continuous variable, each additional DOPEN past 50 DIM resulted in 0.016 ± 0.002 lbs/day extra milk production throughout 2 consecutive lactations (including days dry).

There was a farm effect for 4 of the 6 farms, but there was no difference in culling risk between the DOPEN categories.

Significance

The effect of DOPEN is not limited to the lactation during which it is measured, there are important productive implications in the following lactation. When evaluating the effect of reproductive interventions, it is important to take into account that the cows are to be part of the herd for longer than just the studied lactation, and that effects that may seem positive in the short term, may have detrimental long-term implications. Farmers rely on sustained milk production by the same cows over several years. This study shows that cows that get pregnant later in lactation had higher milk production, both in that lactation and the following lactation.

