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Calf Note 189 – Prepartum stress and calf productivity

Introduction

The evidence continues to build up... that what you do to mama you do to baby. Several Calf Notes ([152](#), [161](#) and [179](#)) have summarized some wonderful research that documents effects of prepartum nutrition and management on health and growth of the calf after birth. And, other research in beef calves, lambs and several other species also document the long-lasting effects on the newborn.

A recent study in the Journal of Dairy Science from the University of Florida (Monteiro et al., 2016) summarizes the compilation of five different research trials wherein dry cows were either cooled or not cooled for the last six weeks before calving and the effects of cooling on growth, insemination and first lactation milk production.

The Research

Data were compiled from five experiments conducted during five summers (2007-2011) at the research dairy at the University of Florida. Multiparous Holstein cows were dried off about 45 days before their calving date and assigned to either cooling or non-cooling groups. Cooled cows were housed in a freestall barn equipped with sprinklers, fans and shade. The non-cooled cows had access to shade, but no sprinklers or fans. All cows were in the same barn.

Newborn calves were fed 3.8 L of colostrum and then fed pasteurized milk to weaning at d 49, plus ad libitum access to starter and water. Thereafter, calves were managed normally - transitioning from calf starter to TMR; inseminated at a minimum of 1.3 m in height, 340 kg body weight at 13 months of age. Calves in each treatment group were managed similarly, so differences in results could be attributed to the effect of cooling of the dams. A total of 146 records were analyzed (72 heifers in the cooled group and 74 in the non-cooled group).

Results

There was no effect of prepartum treatment on the sex of the calves born, number of DOA's, or calf survival to 4 months of age. However, the number of calves leaving the herd before puberty was higher (8 heifers vs. 1) in the non-cooled group. The number of heifers completing first lactation was also greater in the cooled group (35 vs. 29).

Results from the study also confirmed previous research that calves born to stress cows were lighter (39.1 vs. 44.8 kg) at birth. The calves gained similar amounts of weight to 12 months of age (299 vs. 306 kg for stressed vs. non-stressed calves, respectively).

Milk production averages for the first lactation are in Table 1. Heifers born to dams that were cooled produced more milk through 35 weeks of lactation compared to heifers from dam not cooled. The difference was 5 kg/d (31.9 vs. 26.8 kg/d). If we calculate the total difference in production – i.e., 5 kg/d x 7 days/week x 35 weeks = 1,225 kg of milk difference between groups.

First lactation milk production is shown in Figure 1. The difference between groups was consistent throughout lactation. Visually, it appears that cooled heifers had greater consistency later in lactation, but this was not tested in the research trial.

| Item | Cooled | Not Cooled | P |
|----------------------|--------|------------|------|
| Heifers, no | 35 | 29 | ... |
| Milk, kg/d | 31.9 | 26.8 | 0.03 |
| 3.5% FCM, kg/d | 31.9 | 26.8 | 0.01 |
| Milk fat, % | 3.55 | 3.64 | 0.44 |
| Milk true protein, % | 3.00 | 3.05 | 0.24 |

Table 1. Production of heifers through 35 weeks from dams that were cooled or not cooled prior to calving. From: Monteiro et al., 2016.

Summary

This manuscript documents the latest in an important series of research trials that show clearly that prepartum management has profound effects on the fetus. This study shows that these effects are not just academic – they translate into significant production and significant money. The message is clear: take care of your cows to take care of your calves.

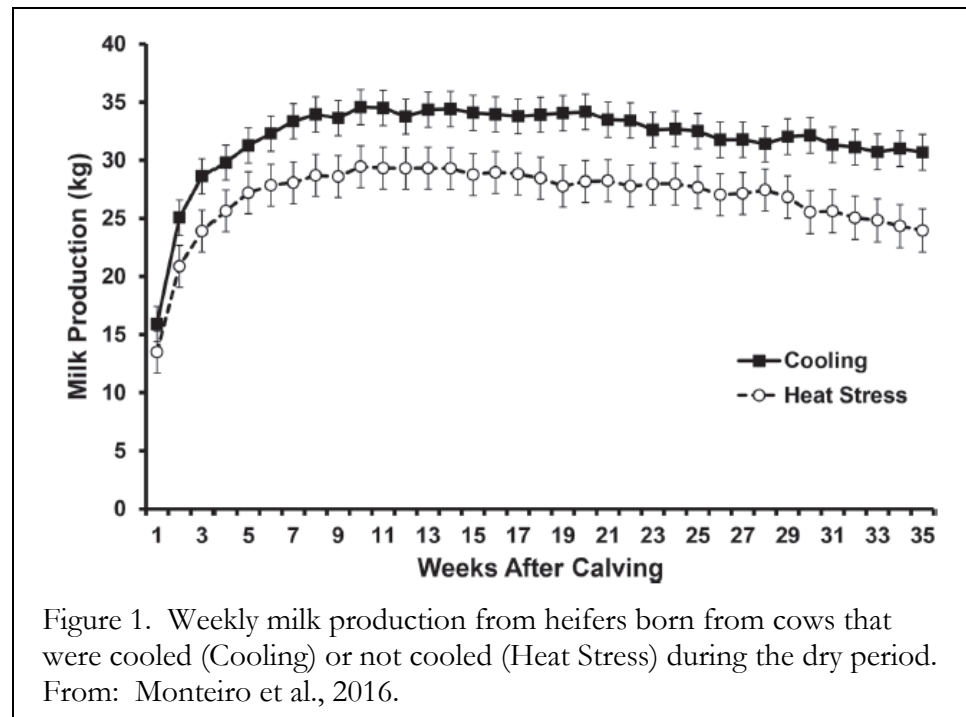


Figure 1. Weekly milk production from heifers born from cows that were cooled (Cooling) or not cooled (Heat Stress) during the dry period. From: Monteiro et al., 2016.

Reference

Monteiro, A.P.A., I.M.T. Thompson, and G. E. Dahl. 2016. In utero heat stress decreases calf survival and performance through the first lactation. *J. Dairy Sci.* 99:1-8. <http://dx.doi.org/10.3168/jds.016-11072>.

Written by Dr. Jim Quigley (05 September 2016)
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