

Changes in Periparturient Metabolic Diseases and Start-Up Milk: An Animate[®] Field Study

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INTRODUCTION

The use of a negative dietary cation anion difference (DCAD) diet for late pregnant dry cows is an effective nutritional strategy for controlling many transition cow metabolic disorders and improving early lactation performance (Block, 1984, Beede et al., 1992, Beede, 1995). In a 2006 National Animal Health Monitoring Service (NAHMS) summary it was reported that over 50% of second or greater and 25% of first lactation cows experience low blood calcium or subclinical hypocalcemia even though there were no physical signs of clinical milk fever. Research has shown that low blood calcium around the time of calving is associated with several transition cow disorders such as retained placenta and metritis. In addition, dry matter intakes both pre- and post-partum are affected as well as early lactation performance (Vagnoni et al., 1997, Kimura, et al., 2002, Goff, 2006).

The short-term feeding of anionic salts, those containing high levels of chloride and sulfur, have been shown to be effective in initiating physiological mechanisms for maintaining normal blood calcium levels around the time of calving via the mobilization of calcium from bone and absorption from the GI tract (Goff, 2006). The purpose of this field study was to observe changes in transition cow metabolic disorders and subse-

quent milk production when cows were fed Animate, an anionic mineral supplement, for 21 to 28 days prior to expected calving.

HERD HISTORY AND METHOD

A high producing 1,000 cow dairy with a history of fresh cow disorders participated in a 90-day Animate feeding study. Although the incidence of clinical milk fever was reported to be low (< 2.0%), the dairy was experiencing high rates of displaced abomasum (> 14%), metritis (> 8.0%) and retained placenta (> 13%) among the fresh cows, which were consistent throughout the year.

Animate was added to the diet of the pre-fresh cows and heifers beginning on February 1, 2009 and health events and production were monitored for the next 120 days (n=218 h). These data were compared to that of cows which had freshened from September 2008 through January 2009 (n=519 h). Animate was formulated into the pre-fresh diets to initially provide a negative DCAD level of -6 mEq/100g DM and then reformulated to a -12 mEq/100g DM. This change reduced average urine pH from 6.7 to 6.2, which was the target level. Pregnant heifers and cows were housed separately, with heifers and cows introduced to the Animate diets 28 and 21 days prior to calving, respectively. The pre-fresh cows were fed a total mixed

ration consisting of corn silage, wheat straw, canola and a mineral supplement. Animate was added on-farm.

HERD HEALTH AND PRODUCTION METRICS

Changes in the incidence of transition cow disorders are shown in Table 1. Cows and heifers fed Animate during the pre-fresh period were observed to experience differences in the number of cases of metritis (-4.9%) and displaced abomasums (-10.6%) as compared to cows freshening in the previous 5 months. The number of reported cases of retained placenta was observed to be similar between the cows supplemented with Animate (14.6%) and those not fed a pre-fresh diet with Animate (13.8%).

TABLE 1

Transition cow disorders – expressed as percent of fresh cows

	No-Animate	Animate	% Change
Displaced abomasum	14.1%	3.5%	-75.2%
Metritis	8.9%	4.0%	-55.0%

Fresh cow performance was evaluated based on dry matter intake post-fresh and in the high pens, week four milk averages and first service conception rate. Cows fed Animate during the pre-fresh dry period consumed more dry matter daily in the early post-fresh period than cows not fed Animate (52.0 lbs vs. 49.9 lbs). Week four milk production was also observed to be different for cows supplemented with Animate during the pre-fresh period (88.33 lbs vs. 84.26 lbs). Week four milk differences were also observed across all parity groups (Table 2). First service conception rates

were compared for cows supplemented with Animate (February '09 – May '09) versus those not supplemented (June '08 – January '09). In this study, cows fed Animate in the pre-fresh group were observed to have a 6% higher first service conception rate among eligible cows than those not supplemented (44% versus 38%).

TABLE 2

Milk production summary^a

	No-Animate	Animate	Change (lb/d)
No. Cows ^b	519	218	
Week 4 Milk (lb):			
Lactation 1	67.1	68.9	+1.8
Lactation 2	92.8	99.5	+6.7
Lactation 3+	92.9	96.6	+3.7
Ave. Week 4 Milk (lb)	84.26	88.33	+4.07

^aStudy periods: No-Animate, June-December 2008, Animate, February-June 2009.

^bPercent of fresh cows by lactation number (1, 2 and 3+) by study period: No-Animate: 40, 30, 30, Animate: 32, 30, 39.

ECONOMICS OF IMPROVED TRANSITION COW HEALTH

Animate was fed at a rate of 0.8 lb/h/d with a daily per head cost of \$0.53 or \$11.13 for a 21 day pre-fresh feeding period. This dairy calved approximately 75 h/month which resulted in a monthly Animate investment of \$834.75. Using the observed changes in fresh cow cases for metritis and displaced abomasum through the 4 month study period, an estimate of cases per month for each disorder was calculated. This estimate was then used to calculate health cost differences (Figure 1). The cost savings from reduced monthly cases of displaced abomasums and metritis changes resulted in an estimated return on investment of 6.5:1.

FIGURE 1

Transition health economics

Estimated economics of reduced transition cow disorders^a:

9.9 fewer DA cases/mo x \$340/cs = \$3,366.00
7.2 fewer metritis cases/mo x \$285/cs = \$2,052.00

\$ gained by reduced cases = \$5,418.00

Estimated Return on Investment:

\$5,418.00 saved from reduced cases and a \$834.75
DCAD management investment/mo^b =

6.5:1 Return on Investment

^aCost per case from lost or discarded milk, veterinary fees, labor, drugs or culling. C. Guard, Hoard's Dairyman, 1996. 141(1):8

^bBased on a 21 day pre-fresh feeding period

SUMMARY

Transition cow diseases reduce the profitability of the cow. Management and nutritional practices such as grouping late pregnant dry cows separately and feeding a negative DCAD pre-fresh diet are two strategies proven to be of benefit in reducing many transition cow diseases and enhancing early postpartum lactation performance. In this study, differences in recorded cases of metritis and displaced abomasums were detected between cows fed Animate for 21-28 days prepartum and cows not supplemented. Milk production as measured by week 4 milk weights was also observed to be different. The overall economic benefit to the dairy in this study was an estimated 6.5:1 return on investment.

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