Milk Urea Nitrogen and Infertility in Florida Dairy Cows

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Introduction

While the negative impact of dietary protein on fertility in dairy cattle has been documented in several studies, the effect of urea nitrogen on fertility in dairy cattle in large dairy operations has not been fully investigated. The objective of this study was to assess the association between milk urea nitrogen (MUN) concentrations (high, low) and pregnancy status 42-49 days after first breeding in Florida dairy cows.

Materials and Methods

Cows in this study were from a high-producing herd 23,100 lb (10,500 kg rolling herd average milk) of approximately 3,600 cows in Florida. Study cows were all those that were bred (first service) between September 1997 and July 1998, with MUN values that were recorded within 1 to 30 days before breeding. Thus, a total of 1,088 (35%) of 3,146 records were considered for inclusion in the study. Fifteen records were detected with data entry errors and were not included in the analysis. The final study enrollment was 515 cows exposed to high concentrations (17-25 mg/dl) and 558 cows exposed to low concentrations (6-16 mg/dl) of MUN. After breeding, cows were followed for 42 to 49 days for pregnancy diagnosis. The outcome variable was pregnancy status after breeding. Cows exposed to high or low MUN concentrations were compared according to: parity (1,2,3,4+), calving season (Nov-Apr, May-Oct), dystocia (yes, no), breeding season (Nov-Apr, May-Oct), days to first service (quartiles), current milk yield (quartiles) and ME-305 (quartiles). Odds ratios and 95% confidence intervals were used. The adjusted effect of MUN concentrations (high, low) on pregnancy status (yes, no) was determined using a logistic regression model.

Results and Discussion

During the study period, 347 cows (32%) were classified as pregnant. Cows exposed to high concentrations of MUN were 1.16 times at higher risk of non-pregnancy (OR = 1.16, 95% CI = 0.90, 1.50), compared to cows exposed to low concentrations of MUN. Cows that calved during the summer months were 9 times at higher risk of non-pregnancy (OR = 9.01, 95% CI = 6.58, 12.33), compared to cows that calved during the winter months. Using logistic regression, there was a strong interaction between the MUN and breeding season variables in the model. The relative odds of non-pregnancy associated with high MUN concentrations were 1.02 and breeding season (summer) were 10.14. The relative odds of non-pregnancy increased to 17.87 on cows where both of these factors were present.

Table 1. Logistic regression model for risk of non-pregnancy in cows with or without high concentrations of MUN

Factor	Adjusted odds ratio	95% CI
MUN		
6-16 mg/dl	1	
17-25	1.02	0.72-1.45
Parity		
1	1	
2	1.08	0.73-1.59
3	0.68	0.45-1.03
4+	1.02	0.68-1.54
Calving season		
Nov-Apr	1	
May-Oct	2.78	1.93-4.01
Breeding season		
Nov-Apr	1	
May-Oct	10.14	6.40-16.06
MUN x Breeding season	17.87	10.08-31.70