

Effect of Prepartum Crude Protein Level on Performance of Multiparous Holstein Cows

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Introduction, Materials and Methods

Recent studies have shown that increasing dietary crude protein (CP) prepartum above National Research Council (NRC) (1989) recommendations does not influence multiparous dairy cow performance. To evaluate the effect of prepartum dietary CP level on performance during early lactation, 64 multiparous Holstein cows were utilized in a randomized complete block design. Cows were blocked according to previous lactation 305ME and lactation number, and randomly assigned to one of two treatments. Treatments were initiated 30 days prior to expected calving date and continued throughout parturition. Diets fed were categorized as moderate CP (12.7 % CP, 36% UIP) or high CP (14.7 % CP, 40% UIP). An animal-marine protein blend (Prolak[®]) was used to increase CP content in the high-protein diet. Following parturition, all animals were subjected to the same management and dietary treatments. Blood samples, collected on days -30, -15, -10, -5, 2, 5, 15 and 30 relative to calving, were measured for plasma glucose, NEFA, and BHBA. On the day of calving, a colostrum sample was collected for analysis of nu-

trient content and IgG concentration. On day 10 postpartum, the uterus and ovaries of each cow were scanned by ultrasound twice weekly to evaluate presence and number of follicles, presence and size of corpus luteum (CL), and presence of cystic structures.

Results and Conclusion

Milk production averaged 94.3 lb/d (42.9 kg/d) and it was not influenced by prepartum treatment. Yields of FCM and milk components as well as concentrations of protein and somatic cell count (SCC) in the milk were not significantly affected by prepartum diet ($P > .15$). Milk fat percentage tended to be higher for the moderate CP diet ($P < .11$). The concentration of CP, ash, and IgG in colostrum did not differ between treatments, but total solids tended to be higher for the moderate CP diet ($P < .08$). Prepartum dietary CP concentration had no effect on pre and postpartum plasma glucose, changes in BCS, days to complete uterine involution, and days to first postpartum ovulation. The results from this study suggest that prepartum multiparous cows do not benefit from a diet with more than 12.7 % CP.

Table 1. Effect of prepartum dietary protein on performance of multiparous cows

Item	Treatment		SEM	P <
	Moderate	High		
Milk, kg/d	42.8	43.0	1.08	0.89
FCM, kg/d	41.9	40.9	1.05	0.52
Fat, %	3.41	3.23	0.08	0.11
Fat, kg/d	1.42	1.37	0.04	0.34
Protein, %	3.03	3.01	0.03	0.54
Protein, kg/d	1.29	1.28	0.03	0.86
SCC, x 1,000/ml	145.4	138.9	25.11	0.86
Plasma glucose				
Prepartum, mg/dl	63.90	63.40	1.81	0.86
Postpartum, mg/dl	63.94	60.50	3.00	0.46
Colostrum				
CP, %	15.57	15.02	0.84	0.65
Total solids, %	25.18	22.35	1.03	0.08
IgG, mg/dl	5,919	5,295	682	0.53