

Effect of Dietary Crude Protein Contents on Lactation Performance, Nitrogen Excretion and Nitrogen Emission from Manure in Cows

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Summary

In order to clarify the effect of dietary crude protein (CP) contents on lactation performance, nitrogen (N) balances, and nitrogen emission from manure, nine balance trials were conducted using four primiparous Holstein cows. Experimental design was followed L9-orthogonal table method, which treated animals and CP contents as factors. The results obtained were as follows; 1) There was no effect of CP contents on lactation performance. However, Nitrogen excretion in urine (UN), milk urea nitrogen (MUN) and plasma urea nitrogen (BUN) increased as dietary CP contents increased. 2) The relationship between UN (g/day) and CP contents (%), MUN (mg/dl) or BUN (mg/dl) was $UN = 22.0 \text{ CP} - 208.9$ ($r^2 = 0.84$), $UN = 16.2 \text{ MUN} - 77.5$ ($r^2 = 0.78$), $UN = 8.8 \text{ BUN} + 18.6$ ($r^2 = 0.77$), respectively. 3) Nitrogen emission from manure tended to increase as CP content increased. In conclusion, the reducing dietary CP content in cows is a way to reduce nitrogen excretion and nitrogen emission without the suppression of productivities of lactating cows.

Keywords: Dairy cattle, Odor, Ammonia, Nitrogen balance, Manure