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Reducing nitrogen output from zero-grazed lactating cows by using low-protein concentrates

Deborah Hynes^{1,2}, S Stergiadis¹ and T Yan¹

¹Agri-Food and Biosciences Institute, UK

²Queen's University of Belfast, UK

Improved nitrogen use efficiency is essential to reduce production costs and nitrogen outputs in the environment. The aim of this study was to investigate the effect of crude protein content of concentrates on nitrogen utilization. Twelve multiparous dairy cows grouped based on milk yield, live weight, lactation stage and milk fat and protein (CP) contents which were 35±3.7 kg/d, 544±45 kg, 119±20.5 days in milk, 37.5±2.81 g/kg, 32.5±2.31 g/kg respectively were used. Each group was fed fresh cut perennial ryegrass at 65% dry matter (DM) intake and concentrates at 35% DM intake. Records of feed intake and total outputs in feces and urine were performed. Data were analyzed by residual maximum likelihood analysis using breed (pure Holstein, Holstein crossbreds) and concentrate type (low CP, 13% DM; medium CP, 15% DM; high CP, 17% DM) as fixed factors and cow as random factor. The effect of breed or concentrate type was not significant on milk yield although Holstein cows had higher yield than Holstein crossbreds when both groups fed medium CP diets. Overall, low CP concentrate did not affect milk yield but decreased urinary N output by 30 g/d (P=0.016). The effect of breed or concentrate type was also non-significant on milk urea nitrogen contents and fecal N outputs. This study highlights that supplementing pasture-based diets with CP levels as low as 13% DM, may sustain performance while economically improving productivity and show positive environmental implications by reducing N outputs in the environment.

Biography

Deborah Hynes is a PhD student in Agri-Food and Bioscience Institute (AFBI), Hillsborough, UK. She has completed her first degree program in Biotechnology, Dublin City University, Ireland. She is a member of the ruminant nutrition unit of AFBI, headed by Professor Tianhai Yan. Prior to her PhD, she gained experience as a Scientific Officer in AFBI, Hillsborough.

deborah.hynes@afbini.gov.uk

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