Nutritional evaluation of metabolizable protein and degraded protein balance of chickpea varieties growth in western Canada for dairy cows

Linda Cerna, and Peiqiang Yu*
Department of Animal and Poultry Science, College of Agriculture and Bioresources, University of Saskatchewan. *Corresponding author: Email: peiqiang.yu@usask.ca

There is limited information about detailed nutritional value of chickpeas for ruminants. The objectives of this study were to evaluate metabolizable protein and degraded protein balance of chickpeas varieties growth in western Canada for dairy cows. Three chickpea varieties were grown in three locations in western Canada. The items included MCP_{TDN}: rumen synthesized microbial protein base on available TDN; MCP_{RDP}: microbial protein synthesized in the rumen based on available protein, AMCP: truly absorbed microbial protein in the small intestine; ARUP: truly absorbed rumen undegradable protein in the small intestine; AECP: truly absorbed rumen endogenous protein in the small intestine; MP: metabolizable protein, as well as DPB: rumen degraded protein balance. The treatment design was one-way structure and the experimental design was a randomized complete block design with variety as a fix effect and location as a random effect. The data was analyzed using SAS MIXED model procedure. The results showed the variety did not have significant impact on truly absorbed microbial protein in the small intestine (AMCP) with an average of 66 g/kg DM, truly absorbed rumen undegradable protein in the small intestine (ARUP) with an range from 67 of 95 g/kg DM, truly absorbed rumen endogenous protein in the small intestine (AECP) with an average of 4 g/kg DM, metabolizable protein (MP, ranging from 138 to 166 g/kg DM), as well as negative rumen degraded protein balance (DPB, ranging from -41 to -56 g/kg DM).
Take home message: This study indicated that chickpea variety did not show a great impact on true protein value in terms of metabolizable protein and degraded protein balance for dairy cows. The negative degraded protein balance indicated a potential shortage of protein for optimal nitrogen and energy synchronization.

How does the duration of low feed intake affect the ruminant gastrointestinal tract?

K. Lambert[1], A.C. Chagas[1], K. Burakowska[1], D. Watanabe[1], K. Hare[1,2], G.B. Penner[1]
[1]University of Saskatchewan, Saskatoon, SK, S7N 5A2, [2]Univeristy of Guelph, Guelph, ON, N1G 2W1. Koralie.lambert@usask.ca

Cattle experience periods of low feed intake (**LF**) in association with parturition, metabolic disorders, infectious disease, and heat stress. Little is known about how the gastrointestinal tract of ruminants responds to periods of LF. The objective was to determine the impacts of different durations of LF on the gastrointestinal tract (**GIT**) in lambs. Twelve rams and nine wethers were blocked by sex and BW and exposed to 5-d of ad libitum feeding followed by 0 (**CON),** 5 (**LF5**; fed at 30% DMI), or 10 d (**LF10;** fed at 30% DMI) of low feed intake. At the end of the study, lambs were euthanized and the gastrointestinal tract was removed to determine the digesta and tissue weights by region. In addition, the weights of the liver, spleen, and kidneys were recorded. Initial and final BW did not differ by treatment, but the weight of the reticulo-rumen was less for LF10 than CON with LF5 being intermediate but not different. Abomasal tissue weight was lighter for LF10 than CON and intermediate but not different for LF5. Likewise, the abomasal digesta weight was the greatest for CON, intermediate for LF5, and the least for LF10. The weight of the duodenum and ileum tended to be greater for CON than either LF treatment; while, for the jejunum's weight, CON was only greater than LF10. Cecal tissue weight was not affected but digesta weight was the greatest for LF10, intermediate but not different for LF5, and the least for CON. In contrast, colonic tissue weight was least for LF10 relative to LF5 and CON and digesta weight was greater for CON than either LF treatment. Liver weight was reduced for both LF5 and LF10 relative to CON, but kidney and spleen weights were not affected.
Take-home message: Exposure of ruminants to LF may reduce the weights of the gastrointestinal tract regions and liver with rapid effects. These changes likely reflect reduced absorptive capacity of the gastrointestinal tract and lesser metabolic capacity of the liver.