

469 Effects of mycotoxin deactivator on rumen parameters: In vivo and in vitro approaches.

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Ingestion of mycotoxins by dairy cows can result in many problems including decreased feed intake, production, fertility, and an impaired immune system. The objective of this study was to determine the effects of a mycotoxin deactivator on rumen parameters using rumen-fistulated cows and an in vitro intestinal fermentation model. Nine ruminally fistulated Holstein cows were used in a replicated randomized block trial for 7 wk. Treatments were 1) negative control diet; 2) positive control diet (PC) with mycotoxin contaminated dried distillers grains; and 3) PC diet plus 30 g/d of mycotoxin deactivator (UNIKE Plus (UP), Adisseo). Rumen samples were collected on the last 2 d of the covariate period, wk 3 and 6 of the study. Samples were processed for VFA and microbial DNA. Four other nonlactating Holstein cows were used as rumen fluid donors. After a 2-wk adaptation period, rumen fluid was collected for each cow and kept in an anaerobic buffer. For each inoculum (n = 4), treatments were a control treatment with 800 mg feed and a treatment with 800 mg feed + 96 mg UP. Using the APES (Automated Pressure Evaluation System), VFA production was measured after 48 h fermentation. Data were analyzed using the MIXED procedure of SAS with REPEATED measurements. Significant effect was noted at $P \leq 0.05$. The in vivo study showed a significant increase for butyrate and isobutyrate ($P < 0.02$) and isovalerate ($P < 0.01$) with supplementing the mycotoxin deactivator. Bacteria and archaea relative abundance was also affected by UP, resulting in a higher bacteria:archaea ratio ($P = 0.04$). UP also resulted in a significant increase ($P < 0.05$) of propionic, isobutyric, butyric, isovaleric and valeric acids measured in the APES model. Total branched VFA was also significantly higher ($P < 0.001$) in the treatment group while total VFA tended to increase ($P = 0.07$). This study showed that mycotoxins contamination can impair the rumen parameters. These parameters can be restored by dietary mycotoxin deactivator enable to shift the microbiota resulting in an improvement of the production of beneficial metabolites and thus, enhancing health and performance of the cows.

Key Words: mycotoxin, rumen function, microbiota