NUTRIENT INTAKE AND TOTAL TRACT DIGESTION OF JERSEY HEIFERS FED CHITOSAN AND WHOLE RAW SOYBEAN

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Chitosan is a natural biopolymer derived from the deacetylation of chitin. The antimicrobial activity of chitosan is well known against bacteria and fungi. However, the utilization of chitosan in animal feeding has been underexplored, and there are few studies available in literature. The aim of this study was to evaluate the nutrient intake and total tract digestion in Jersey heifers supplemented with chitosan and whole raw soybeans. Eight animals with average body weight of 158.62 ± 1.75 kg were used in two 4x4 Latin squares, in 2x2 factorial arrangements. The experimental period was 18 days with 12 for adapting experimental diets, 6 for data collection, and 5 days of wash out. The experimental diets were: control (CON), chitosan (CHI, inclusion of 2.0% DM of chitosan), whole raw soybeans (WS, 16.3% of WS on diet DM), and chitosan + whole raw soybeans (CHI+WS). Diets were formulated to achieve an average daily gain of 700.0 g/d by NRC, 2001 software. Samples of all diet ingredients (0.5 kg) and orts (12.5% of total daily orts) from each heifer were collected during the last 6 days of each period and combined into one composite sample of ort for each cow and one composite sample of silage. Samples were analyzed to determine dry matter (DM), crude protein (CP), ether extract (EE), neutral detergent fiber (NDF), acid detergent fiber, lignin and ash. Total feces collection was performed during a 24h-period on days 15, 16 and 17 of each experimental period from each heifer, and then feces were homogenized and aliquots of 10% were frozen at -20ºC until analyses. Data were submitted to analysis of variance using the PROC MIXED by SAS, 9.0. Chitosan decreased DM and NDF intake. In addition, CHI increased DM total tract digestion. Whole raw soybean decreased NFC intake and increased EE intake. Moreover, WS increased the EE total tract digestion. Chitosan decreased intake of DM and NDF, and increased DM total tract digestion. Animals fed WS had lower intake of NFC and increased intake of ether extract. Frequently, when supplemental fat is added to the diet a source of NFC is withdrawal, thus the EE content increase and the NFC content of diet decrease. As there was no effect on DMI when cows received WS treatment, heifers increased intake of EE and decreased intake of NFC. Chitosan improved nutrient digestion and decreased dry matter intake, and consequently reduced nitrogen excreted on feces.

Keywords: additive, digestion, metabolism

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