
Abstract:

Ruminal disappearance kinetics of nutrients such as phosphorus (P), starch and protein in cereal grains is determinant of their nutritional and health value in ruminants. The objective of the present in vivo and in situ trials was to evaluate whether feeding barley grain processed with lactic acid (LA), with or without thermal treatment, affects in situ degradation kinetics of nutrients, reticuloruminal pH dynamics, and apparent total tract digestibility (ATTD) in dairy cows. The experiment involved 6 rumen-fistulated Holstein cows in a double 3 × 3 Latin square design fed a diet based on differently processed barley grain: untreated grain as control (CON), or grain treated with 1% LA alone (LA diet), or 1% LA plus oven-heating (LAH diet) prior to feeding. Each experimental period lasted 21 d, with the first 11 d used for adaptation to the diets. The in situ trial consisted in the incubation of the differently treated barley grains (i.e., CON, LA, LAH) up to 48 h in the rumen of cows fed diets containing the respective barleys. The reticuloruminal pH and temperature were continuously measured throughout the experiment via wireless indwelling sensors. In situ data demonstrated increased (P

Keywords:

Barley grain processing; Dairy cow; Lactic acid; Rumen fermentation; Rumen undegradable starch; Phosphorus

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