Rumen and post-abomasal disappearance in lactating cows of amino acids and other components of barley grain treated with sodium hydroxide, formaldehyde or urea

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Abstract

Four rumen and duodenum cannulated, Holstein lactating cows were used in a change-over design to determine the effects of NaOH, formaldehyde (HCHO) or urea treated barley on disappearance of dry matter (DM), crude protein (CP), amino acids (AA), NDF, ADF and starch of barley in the rumen, post-abomasal (PAT) and total tract by the mobile nylon bag technique. Experimental treatments were coarse milled barley, barley treated with 35 g NaOH/kg, barley treated with 4 g formaldehyde/kg and barley treated with 35 g urea/kg, in which all chemical treated barley was milled coarse before feeding.

NaOH treatment reduced concentrations of lysine and cystine in the barley grain. All chemical treatments decreased rumen disappearances of barley CP but only NaOH and formaldehyde treatments also decreased total AA and some of the AA disappearances in the rumen. All chemical treatments increased DM, OM, CP, starch, NDF and ADF disappearance of barley in the PAT, but only NaOH and formaldehyde treatments increased total AA and most individual AA disappearances in the PAT. Chemical treatments increased disappearance of starch, methionine and glycine in the total tract (P<0.05).

Abbreviations: AA, amino acids; TAA, total amino acids; NEAA, non-essential amino acids; EAA, essential amino acids; PAT, post-abomasal tract; HCHO, formaldehyde

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