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INFLUENCE OF SODIUM HYDROXIDE TREATMENT OF BARLEY GRAIN ON IN VITRO APPARENT AND TRUE SUBSTRATE DEGRADABILITY AND MICROBIAL-N PRODUCTION

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INTRODUCTION

In order to investigate the effects of sodium hydroxide treatment of whole barley grain (WBG) on apparent and true substrate degradability and microbial-N yield, an experiment was conducted using in vitro gas production technique.

MATERIALS AND METHODS

Experimental treatments included untreated whole barley grain and treated barley grain with NaOH+water (35 g + 220 ml/kg DM WBG) for 30 days. In vitro gas production technique was used to determine the parameters of the samples (2001) Gas volume at $t_{1/2}$, apparent substrate degradability (ASD), true substrate degradability of barley grain (TSD) and microbial N at $t_{1/2}$ for two treatments were measured. The gas production parameters, conducted in 3 runs, were measured as a complete randomized block design with the treatment as the main effect. Statistical model was $Yij=\mu+Ti+Bj+\varepsilon ij$ where Yij is the observation from treatment i, μ, the overall mean, Ti the mean of treatment, Bj, block and εij, the residual effect.

RESULTS AND DISCUSSION

Results of the in vitro technique revealed that alkali treating of WBG caused an increase in the gas volume at $t_{1/2}$ but was not significant ($P<0.05$). Apparent substrate degradability (ASD) and true substrate degradability of barley grain (TSD) increased by NaOH-treated barley versus untreated barley which may originate from reducing the resistance of seed coat by treatment. This confirmed the findings of Ørskov *et al*.(1981) who reported that for whole barley, the digestibility of all fractions improved by treatment with NaOH. In addition, Barnes and Ørskov (1981) indicated that the digestibility of starch increased linearly with NaOH application. Rumen microbial-N yield decreased (from 1.344 to 1.282 mg) by the treatment of barley with NaOH. The finding of present study leads us to conclude that treatment of WBG with sodium hydroxide had no effects on substrate degradability and microbial-N production.

Keywords: barley grain, gas production, degradability, microbial-N

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