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RESEARCH PAPER

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Effect of formaldehyde treatment and different incubation periods on *in vitro* protein degredability of soybean meal

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ABSTRACT

An experiment was conducted to study the effect of formaldehyde treated soybean meal at different incubation periods on protein degradability at Department of Animal Husbandary and Dairying, College of Agriculture, Nagpur during 2008-2009. The protein degradability values of soybean meal was significantly (P<0.05) affected due to combination of HCHO treatment and incubation periods. However, values of T_5I_3 (9.38 %) was found to be non-significant to T_5I_2 (9.08 %) in reduction percentage of protein degradability. Protein solubility reduced up to 88 % with 2.5 % HCHO and 12 hours of incubation period. Combination of T_3I_3 was found to be best treatment in protection of protein. Values in per cent protein degradability were found to be significant. The reduction per cent of protein degradability increased with increasing levels of incubation period.

KEY WORDS : Incubation period, Formaldehyde, Protein, Soybean meal

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INTRODUCTION

Protein content of ration is the important nutritional consideration for feeding animals. However, protein supplements are more expensive ingredients in ruminant ration. Protection of natural proteins of high biological value from degradation in the rumen seems to have great potential in ruminant nutrition for better growth and production (Malik and Chopra, 1978; Tiwari and Yadav, 1989). Formaldehyde treatment has been found to be an efficient and comparatively cheaper method to protect highly degradable protein sources (Ramchandra and Sampath, 1995). Formaldehyde treatment at different incubation periods to soybean meal offers a possible means of protecting the protein from degradation by rumen microorganisms and decreases pH level. Hence, the present study was undertaken to assess the protection of protein of soybean meal by different levels of formaldehyde treatment at different incubation periods.

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MATERIALS AND METHODS

The soybean meal was treated with formaldehyde (37%) solution at 0.0 (untreated), 1.0 (T_2), 1.5 (T_3), 2.0(T_4) and 2.5 (T_5) % per 100 gm cp. The crude protein content of soybean meal was 46%. Hence, amount of formaldehyde solution required was 0.0. 12.42, 18.60, 24.84 and 31.04 ml, respectively. The volume of the solution was made to 40 ml with water and formaline solution was sprayed over the samples and mixed immediately. There after, these samples were sealed airtight in polythene bags and kept for 7 days for proper reaction of formaldehyde with proteins. After 7 days, the polythene bags were opened and dried the sample at 75^{0}C for 24 hrs. The treated samples were ground finely after drying. These samples were used for further analysis. The well mixed samples of rumen liquor were drawn from different parts of rumen of two male animals by suction. This strained rumen liquor (SRL) was used for *in vitro* study. The samples were incubated in *in vitro* tubes at 39^{0}C with strained rumen liquor and Mc Dougall's buffer solution for 4,8,12 and 18 hours.

The *in vitro* protein degradation technique recommended by Lohan and Gupta (1990) was followed. The data were arranged in Factorial Completely Randomized Design (FCRD) and analyzed by standard statistical method as per Snedecor and Cochran (1989).