



University of Zabol
Graduate school
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**The Thesis Submitted for the Degree of Master of Science
(In the field of Animal Nutrition)**

**Effect of beam electron irradiation and fibrolaytic enzyme
on ruminal degradation and *in vitro* gas production of rice
straw**

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Abstract

This study was conducted to determine the chemical compositions and the nutritional value of rice straw processed with light Beam- electron and fibrolytic enzyme. Hence, rice straw was collected randomly from farms in Amol city. For radiation on two levels (150 and 300 kg), two 750-gram samples of the food packed in plastic bags were sent to the beam processing center in Yazd city. After irradiation to the samples, two levels (1.5 and 3 g/ kg DM) were added to the fibrolytic enzyme. The chemical compositions including dry matter (DM), organic matter (OM), crude protein (CP), cell wall (NDF) and – hemi cellulose – free cell walls (ADF) were measured using standard methods (AOAC) and organic matter digestibility and metabolizable energy in form of gas production technique (in vitro) and degradation of dry matter using nylon bag method (in situ).. The results showed that at any level , radiation had no significant effect on the amount of dry matter, organic matter, crude ash and crude fat, but it increased the rate of crude protein, yet the cell wall and hemi cellulose- free cell wall reduced. Fibrolytic enzyme also reduced the NDF and ADF, and increases crude protein and organic matter. In total, beam electron radiation and fibrolytic enzyme both separately and in combination affect the chemical composition. The results of degradation showed that radiation and fibrolytic enzyme increased degradation during all time periods of incubation. In addition, the results of gas production indicated that radiation and enzyme could increase the amount of gas production compared to the control.

Keywords: rice straw, radiation, fibrolytic enzyme, degradation, dry matter, digestibility