

## Biological and Biochemical Treatments to Improve the Nutritive Values of Bean Straw (BS): 2- In Vitro Studies to Evaluate the Nutritive Values of Untreated and Treated (BS)

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This study was carried out at Sides Research Station, Ben – Suef Governorate, to study the effect of urea solution (2%, 3% and 4%) or fungi treatment of bean straw on feed intake, digestibility efficiency, nutritive value, nitrogen balance and some rumen liquor and blood constituents. Thirty mature Ossimi rams were divided into five groups. The first group (control, R<sub>1</sub>) fed concentrate feed mixture (CFM) at rate 1% of body weight plus bean straw, ad libitum. The second group fed CFM at rate 1% of body weight plus bean straw treated with fungi (*Trichoderma viride*) (R<sub>2</sub>). The third group fed CFM at rate 1% of body weight plus bean straw treated with 2% urea solution (R<sub>3</sub>). The fourth group fed CFM at rate 3% of body weight plus bean straw treated with 4% urea solution ad libitum. (R<sub>4</sub>). The fifth group fed CFM at rate 1% of body weight plus bean straw treated with 4% urea solution ad libitum. (R<sub>5</sub>). The digestibility trials lasted 4 weeks (3 weeks as preliminary period and one-week collection period). At the end of the experiment, blood and rumen liquor samples were collected at 0, 3 and 6 hrs.

Fungi and urea treatments increased crude protein content of bean straw and decreased DM, OM, CF, NFE, NDF, ADF, cellulose, hemicellulose and lignin contents than untreated bean straw. Dry matter intake (DMI) increased ( $P<0.05$ ) in the groups fed bean straw treated with 4% urea and fungi than the control group. Fungi and urea treatments increased ( $P<0.05$ ) digestibility coefficients of CF, ADF, NDF, ADL, cellulose and hemicelluloses than the untreated bean straw. Total digestible nutrients (TDN) of fungi and urea treatments were higher ( $P<0.05$ ) than untreated bean straw. Treatment of bean straw with fungi increased ( $P<0.05$ ) DCP content than treating with urea or control group. Fungi and urea treatments increased ( $P<0.05$ ) DCP content than urea and control groups. Fungi and urea treatments increased ( $P<0.05$ ) nitrogen intake and had a higher positive nitrogen balance than the control. The ammonia nitrogen concentration or rumen liquor of rams fed bean straw treated with fungi or urea were higher ( $P<0.05$ ) than those fed untreated bean straw. The pH was not significantly lower for urea treated group than fungi treated group and the control group. Urea treated group had higher GOT and urea N concentrations, but lower GPT, while fungi treated group had intermediate value of GOT, GPT and urea N concentration. Based on the results of the study, it could conclude that ammoniation and fungi treatments of bean straw had beneficial effects on improving feeding value and N utilization by sheep but fungi treatment was more effective in all respects. In addition, fungi treatment is preferable in terms of being a biological treatment rather than the chemical treatments for better and clear environment

**Keywords:** bean straw, fungi, ammonia, feeding value, sheep.