

Improving the Feeding Value of Straws with *Pleurotus Ostreatus*

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Abstract : The high content of lignin in cell walls is the major limiting factor in the digestion and utilisation of cereal crop residues by ruminants. The aim of this study was to evaluate the effectiveness of the white rot fungus, *Pleurotus ostreatus* (*P. ostreatus*), to degrade lignin and to enhance the rumen degradability of maize stover, rice straw, wheat straw and their mixture in equal proportion on a dry-matter (DM) basis. Four samples of each substrate were incubated aerobically in triplicate with *P. ostreatus* for 0 (Control), 21, 28 and 35 days under solid-state conditions (temperature, 24 °C; humidity, 70± 5%). The changes in chemical composition, DM and nutrient losses, and rumen fermentation characteristics using in vitro DM digestibility (DMD) and the in vitro gas production (GP) technique were measured. The results showed that incubation with *P. ostreatus* decreased ($P < 0.001$) the contents of neutral detergent fibre and lignin with a concomitant increase ($P < 0.001$) in the contents of ash and crude protein. The losses of nutrients differed ($P < 0.001$) among the straw types, with rice straw and maize stover showing the largest ($P < 0.05$) lignin degradation compared to wheat and mixed straws. The DMD and 72-h cumulative GP increased ($P < 0.001$) consistently with increasing fungal incubation period and for all substrates the highest values of DMD and GP were measured after 35 days of incubation with *P. ostreatus*. The lignin degradation was strongly associated with hemicellulose degradation ($r = 0.71$) across the various straws. Results of the present study demonstrated that incubation of low-quality crop residues with *P. ostreatus* under solid-state conditions upgrades their feeding value by reducing the content of lignin and increasing the content of crude protein and ruminal degradation.

Keywords : crop residues, lignin degradation, maize stovers, wheat straws, white rot fungi

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