**Variation in the solubilization of crude protein in wheat straw by different white-rot fungi**

ABSTRACT

Besides their unique ability to depolymerize cell wall components, white-rot fungi are known to assimilate nitrogenous compounds from substrates. This modification may change protein solubility and fermentation in the rumen. To investigate this, the crude protein (CP) in fungal treated wheat straw (3 fungal species, 2 strains each) was fractioned according to the Cornell Net Carbohydrate and Protein System (CNCPS) and assessed for in vitro protein fermentation using a modified gas production technique (IVGPN). Results showed that fungi increased fraction A (instantaneously soluble CP; ~2.6 times) and B1 (rapidly degradable; ~1.2 times); and decreased the slowly degradable fraction B3 (~41.6%) and unavailable fraction C (~48.3%). The IVGPN of straw treated with Ceriporiopsis subvermispora strains were not different to the control, but increased by 30.2 to 47.1% in Pleurotus eryngii and Lentinula edodes strains. The IVGPN was significantly ($P < 0.01$) correlated to all fractions of CP, except fraction B1 and B2 (intermediately degradable). All fungi also increased the arginine (~56%) and lysine (~15%) contents. This study shows the importance of assessing the protein solubilization by different fungal strains, which can uncover unique mechanisms in the cell wall depolymerization.

**Keyword:** White-rot fungi; Different strains/species; Protein fractionation; In vitro gas production; Wheat straw; Ruminant feed