Tropentag, September 9-11, 2020, virtual conference



"Food and nutrition security and its resilience to global crises"

Enhancement of Cowpea Husk, an Agro-Waste, by White Rot Fungi Towards the Making of a Potential Ruminant Feedstuff

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Abstract

A 30-day study was carried out to convert milled cowpea husk (CH) to a value added ruminant feed employing two white rot fungi, *Pleurotus florida* and *Pleurotus sajor caju* through a solid state fermentation procedure. Chemical composition of resulting substrate was determined. Also, in-vitro gas production method was used to determine the digestibility of organic matter (DOM), short chain fatty acids (SCFA) and metabolisable energy (ME).

Results showed that, crude protein (CP) increased from 14.90% for the un-inoculated CH (Control) to 18.14% for the *P. florida* biodegraded cowpea husk and to 16.70% for the Pleurotus sajor caju biodegraded cowpea husk. Dry matter remained fairly unaltered ranging from 86.06–88.15% i.e. not significant (p > 0.05). No specific trend was observed with ether extract and ash contents ranging respectively from 0.74–1.28 and 4.62–6.02%. Conversely, for the fibre detergent fractions, neutral detergent fibre (NDF), acid detergent fibre (ADF), acid detergent lignin (ADL), hemicellulose and cellulose decreased significantly (p < 0.05) after the thirty-day period of fungal biodegradation. The short chain fatty acid was not significantly different (p > 0.05) but the digestible organic matter and metabolisable energy increased significantly (p < 0.05) compared to the control. The gas volume showed similar trend, increasing from 5.0 to 8.5 mls/200 mg DM in the control and the *P. florida* degraded cowpea husk respectively.

In conclusion, the study showed that white rot fungal treatment of cowpea husk improved chemical composition (especially the crude protein), organic matter digestibility and the metabolisable energy. The insoluble but degradable fraction was highest in the Pleurotus florida degraded sample and the gas production rate followed the same trend.

Keywords: Biodegradation, composition, cowpea-husk, fungi, in-vitro gas

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