Tropentag, October 6-8, 2009, Hamburg

"Biophysical and Socio-economic Frame Conditions
for the Sustainable Management
of Natural Resources"

Nutritional Evaluation of Cowpea Seedhulls Using Different White Rot Fungi

Olufemi Adebiyi, Anthony Ologhobo, Aderinsola Ogundeji

University of Ibadan, Department of Animal Science, Nigeria

Abstract

An experiment was conducted to determine the nutrient composition of cowpea seedhulls subjected to three different white rot fungi (*Aspergillus niger*, *Rhizopus stolonifer* and *Trichoderma viride*) at different fermentation periods for possibility of inclusion in poultry diets. 30 grams of the seedhulls were inoculated with 107 spores of *A. niger*, *R. stolonifer* and *T. viride* separately at 30°C for periods of 0, 7 and 14 days. The substrates were analysed for proximate and mineral compositions before and after fermentation at the end of each period. Fermentation with the inoculum of *A. niger* caused an increase from 14.11 % to 29.68 % in crude protein (CP) content of the seedhulls after 14 days compared to an increase from 14.11 % to 21.45 % and 14.11 % to 28.10 % with the spores of *T. viride* and *R. stolonifer*, respectively over the same time period. The crude fibre content decreased from 30.0 % to 18.0 % in day 14 when the hull was fermented with *A. niger*, while 26.00 % and 20.00 % crude fiber were determined for *R. stolonifer* and *T. viride* respectively. Calculated metabolisable energy values increased in the different treatments as follows: 13.51 %, 12.54 % and 12.27 % for *A. niger*, *T. viride* and *R. stolonifer*.

Fermentation with inoculum of *A. niger* resulted in 22.15 %, 23.45 % and 26.15 % reduction in Acid Detergent Fibre (ADF), Neutral Detergent Fibre (NDF) and Acid Detergent Lignin (ADL) contents, respectively, in day 14, compared to 18.86 %, 22.22 % and 38.46 % with inoculum of *R. stolonifer*. The results also showed significant ($p < 0.05$) reductions in the cellulose and hemicellulose contents of the hull. These results indicate that cowpea seedhulls could be used for possible inclusion in poultry diets. The level would however need to be determined in further studies

Keywords: Cowpea seedhull, fermentation, fungi biodegradation, inocculum

Contact Address: Olufemi Adebiyi, University of Ibadan, Department of Animal Science, 234 Ibadan, Nigeria, e-mail: femibiyi01@yahoo.com