Bioconversion of Aspergillus niger KM treated rice and wheat bran for experimental rat feed formulation

ABSTRACT

This study investigated the nutritional value of pre-treated rice and wheat bran wastes as feed formulation in experimental rats. Aspergillus niger KM isolated from decomposing organic matter was tested for cellulase assay. The lignocellulosic agricultural residues (wheat bran and rice bran) were pretreated with ammonia and diluted sulfuric acid after which solid substrate fermentation with Aspergillus niger KM was carried out. Determination of reducing sugar was carried out and the fermented residues were included as components in feed formulation and were fed to different groups of rats for four weeks. The proximate analysis of the feed formulation showed that the NH3 pretreated feeds gave higher protein content of 21.94%, relative to the control or other groups. Growth performances of animals fed with NH3 pretreated wheat bran significantly increased from 158.25 to 201.66 g throughout the feeding periods. Evaluation of the various feeds' effect on tissue marker enzymes revealed inconsistent alterations relative to the control. Bioconverted wheat or rice bran has nutritive value to support animal growth and could be explored in animal feed preparation.

Keyword: Animal feeds; Reducing sugar; Pre-treatment, Agricultural residues; Microbial fermentation