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Effect of *Aspergillus fumigatus* MT899185 Phytase Addition on the Nutritional and Phytate Content of Formulated Cowpea-Based Poultry Feed

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Biotechnological Approaches to Sustainable Development

Goals

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Abstract

Cowpea, as with other legumes and grains, serves as a huge reservoir for phytate, an anti-nutrient not digestible by monogastric animals due to their inability to produce phytase. The abundance of this legume in Nigeria suggests it could be a suitable alternative to soybean which imparts huge cost

on animal feed production due to importation constraints. The aim of this study is to produce a cowpea-based animal feed using a locally produced phytase and to determine its effectiveness in reducing the phytate content of animal feed and improve its nutritive value. A previously isolated phytase-producing *Aspergillus fumigatus* MT899185 was induced for quantitative phytase production by submerged fermentation at 30 °C for 5 days. The phytase was employed in the formulation of cowpea-based poultry feeds formulated according to the Cobbs breeder's guidelines. Formulated feeds were analysed for proximate and phytate compositions following standard methods. Total activity and total protein obtained from quantitative phytase production were 610 units/mL and 177 mg/mL, respectively. Proximate composition of feed formulated with *A. fumigatus* MT899185 was 11.69%, 18.63%, 2.98%, 7.14%, 39.50% and 20.56% for moisture, ash, fat, crude fibre, protein and carbohydrate contents, respectively. The feed contained 88.31% dry matter, while the gross energy content was 1014.3 KJ/100 g. The phytate content of *A. fumigatus* phytase-supplemented feed was lower (0.198 mg/g) when compared to the feed formulated without the addition of phytase (0.594 mg/g). The locally formulated feed produced resulted in a 29.9% price reduction per 25 kg bag when compared with commercially available poultry feed. This study has demonstrated that addition of *A. fumigatus* MT899185 phytase improved the ash, crude fibre and protein contents while reducing the phytate content of the formulated feed compared to the commercial poultry feed.

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