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Innovations in Cassava Value Chain That Enhances the Productivity of Cassava Farmers and Small-Scale Poultry Producers in Nigeria and Burkina Faso

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Abstract
Four processed cassava product, ABI Brand, Nali Brand, FERMCARPP and the cassava peel/leaf mix have beenreported as viable approaches to adding value to cassava roots and wastes. In a recent workshop at Asaba Nigeria, Nigerian Poultry Feeds Research and Development (NIPOFERD) technology incubators were able to transfer knowledge towards cost–effective poultry feeds production using these processed cassava products to improve the productivity of small-scale farmers in Nigeria.

Keywords: Cassava, cyanogenic glycosides, poultry farmers, Nipoferd

Introduction

Cassava is the most important food crop in the humid tropics in terms of energy yield per unit land area. However, large amounts of cassava and its by-products go to waste each year due to the intrinsic short shelf-life of harvested cassava roots and spoilage resulting from poor handling and delayed processing. Timely processing of surplus cassava harvests and the variouswastes derived from its processing into industrial products could help mitigate this problem,especially whenprocessed into animal feedstuffs. Cassava contains cyanogenic glycosides, and is highly deficient inprotein, thus limiting the utilization of unprocessed cassavain animal feeding. High inclusionlevels of cassava flour in poultry diets usually result in dusty products that produce high moisture faeces and attract nuisance flies, thus, limiting their adoption by farmers.Therefore, the major challenge to research into producing poultry feeds from cassava is to implement solutions to these problems, especially in the areas of equipment fabrication, products development, knowledge dissemination and scaling up of innovations by end users.

Processed Cassava Products Development and Feeding Trials

Research and equipment development efforts by members of the Nigerian Poultry Feeds Research and Development (NIPOFERD) consortium in Nigeria and Burkina Faso have yielded four low-level cyanide containing processed cassava products from the roots and leaves of cassava. These include the ABI Brand, Nali Brand, FERMCARPP and the cassava peel/leaf mix.

The ABI Brand production: This involved peeling or non-peeling of the cassava roots, fermentation in water for four days, drying in the sun and then milling to produce fermented peeled or unpeeled cassava tuber meals, respectively. Thereafter, dusty meals were gelatinized over fire to produce the gelatinized pastes, which were then made into flakes, sun dried to form the dried fermented and gelatinized peeled (PFGC) and unpeeled (UFGC) cassava flakes (Udedibie, 2016). These were then milled to produce fermented gelatinized cassava tuber meals (FGCTM) which were of low cyanide content and had shelf lives of more than one year. The products were used to replace maize in poultry diets in controlled broiler and layer feeding trial. The results showed that 4 days of fermentation followed by gelatinization of cassava tubers resulted in a non-dusty product that was HCN-free if peeled and contained about 50 ppm HCN if unpeeled. Both PFGC and UFGC could completely replace maize in both broiler and layer diets but PFGC promoted development of abdominal fat which is not desirablein laying hens.The product development process however appears laborious and therefore needs to be mechanized before commercialization (Udedibie, 2016).

Nali Brand production: Raw tubers were harvested, washed and subjected to controlled soaking and water treatment (fermentation). Thereafter, the tubers were dehydrated/gelatinized and put through a size reduction machine. The products obtained were granular in nature and non-hydroscopic when exposed to ambient conditions and has remained dry and consistent for more than 3 years (Chinweze, 2016). Currently, the production process of this brand has been up-scaled and is being used in the commercial production of both broiler and layer diets at the farm level.

Production of FERMCARPP: This involved the peeling of cassava tubers, grating into paste, addition of required amount of palm kernel cake (PKC), addition of fungal cultures, pouring into air and water tight containers for 3 – 7 days anaerobic fermentation, then spreading and sun drying. The end product increased by 75% in crude protein over the control and has been shown to store for more than one year after sun drying(Aladi, 2016).Controlled feeding trials with broilers showed that

FERMCARPP could effectively replace maize in broiler diets without compromising performance or quality of the meat product. It canalso be used without drying provided the diets are properly balanced on dry matter basis (Aladi, 2016).

The Peel/Leave mix: Cassava waste products such as leaves, atteke (garri) wastes and cassava peelswere gathered by village women and sundried to about 12% moisture content. Thereafter, they werepulverized touniform particle size for use in animal feeding. The products were much lower in cyanide content, could store for more than six months and are suited for small-scale poultry and pig production (Kiendrebeogo, 2016). The study showed that such non-conventional feedstuffs could be processed in rural communitiesatdifferent cassava production levels. Farmers in Burkina Faso are the ones driving the process and feeding trials with pigs and broilers showed promising performance results (Kiendrebeogo, 2016).This approach could therefore improve food security through value addition to cassava wastes.

Knowledge Dissemination

In a recent workshop at Asaba Nigeria, NIPOFERD technology incubators were able to transfer knowledge towards cost–effective poultry feeds production from processed cassava products to improve the productivity of small-scale farmers in Nigeria. This event formed the basis for the development of market channels for such cassava products when produced by the processors. There is however the need for further action such as installation of cassava processing equipment at cassava producing locations, training of cassava farmers on production of cassava-based poultry feeds and products trialsby product producers, farmers and researchers.

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