ECONOMIC VALUE OF CASSAVA PEELS PRODUCT IN NIGERIA

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Abstract
Cassava is very important to Nigeria economy. This paper tries to highlight on the economic benefits of cassava peels, the innovation and technological result that moved cassava peels from being environment waste/ nuisance to important economic materials that are used in foods and, mushroom production among others. Cassava peels have high amount of cyanogenical and high protein content than the tuber part (Tewe 2004). It constitutes 20.1% of tuber and available annually for feeding ruminant animals. It contains fibre that contains a little starch, the over peeling by rural farmers and are wasted away every year, which when burnt would added value by grating and putting it in other livestock feeds.

Key words: Cassava Wastes, Cassava Peels, Pomance.

Introduction

Cassava being an important crop to Nigeria economy has no part of it that is considered waste. Nigeria is the highest producer of cassava among other crop plants (FAO 2005). It is a very important crop to food security and many factors affect its production. Its peels have change from being environmental problem to an important economic raw materials in industries, animal feeds and mushroom production. The cassava peels are obtained after the fibre have been peeled (Aro, et al 2010). The peels according to Tewe (2004) contain mainly high amount of cyanogenoside and high protein content than the fibre parts.

Research has revealed that cassava peels has 20.1% of the tuber and are available all year round during harvest period as wastes. Adebayo (2008) stated that cassava peel is essentially fibre that contains a little starch from over peeling by rural farmers and are wasted away. Cassava peels were not known to be good for ruminants and livestock especially the wet form which will be fermented a bit and then used as feeds to pigs or make a layer to grow mushrooms on it or ingredient part of soap making. When the peels are burnt, the added value by grating and putting in other livestock feed as inexpensive alternative in non raw stage.

Okike stated that new process and innovation in cassava peels could replace about two million tons of maize for human consumption given to pigs This would now be used for human consumption, constituting significantly to the food security efforts in the country. The use of peels as a partial replacement of maize in young pigs diet was shown to be cost-effective as the inclusion of about 57% level had no

deleterious and harmful effects on the pigs.

Cassava peels have 28.5% dry matter for fresh peels, 66.25% for air dry, 5.7% crude protein for fresh peels and 5.4% for dried, 7.0% ash for fresh and 15.5% for air dried and 3.25% ether extract for fresh and 3.5% for a dried peels (www.cassavaprocess.ng).

However, the cassava peels are perishable and are mostly disposed off by burning or allowing them to rot in heaps causing pollution. Pipat, et al (2011, Smith 1988) stated that cassava peels as roughage and an energy feed in ruminant diet or sundry ensiling and fermentation, should be done to prevent HCN poisoning.

CASSAVA PEELS PROCESSING MACHINE

Locally, cassava peeling is done manually using knives by human efforts. Adebayo (2008) stated that although the economic value of processing cassava peels are very high, the equipment used in modern processing are high. These modern technologies in drying, grating and processing provide readily available and sustainable source of feeding for domestic animals. This increases income of the farmers.

Cassava processing factory is now under construction in Benue State Nigeria. This is the largest producer of cassava, producing about 25 million tones fresh cassava presently. The quantity is used for garri, 6 million tones local product, 1.5 million tones of production of dry chips and 3.5 million tones are cost to wastage before or during peeling processing the tuber. The processing generate the peels, stunps and undertake or damaged in which together account for up to a third of processed whole tuber weight. The machine is designed and made by the features of not cassava processing machine. It is widely used for cassava, potato, kiwi fruits and all kinds of taro roots and adopted the principles of brush process. It is also easy to operate with high output often clean peeling. It uses cassava peeling, cleaning cassava flour and garri production. It is the largest and most advanced fruit and vegetable peeling equipment cleaning. The machine can be made of carbon steel or stainless steel. It can separates, clean, wash and peel at the same time. It is good in appearance, convenient operation, cleaning of large volume and high effectiveness and the energy consumption is small and can work continually. It is desirable.

PRODUCTS FROM CASSAVA PEELS

Processing of cassava tuber yield cassava peels, Pomance (fibre) bran, bagasses, starch as products that can be available for livestock feed when properly processed. These products referred to as sold fibre, reduced (up to 17% of tuber) that remains after the flour or starch content has been extracted (Aro, et al 2010). This quantity and appearance varies with plant age, time after harvest and industrial equipment and method used (Cereda, and Takahashi 1996). The cassava sieveta or gari sieveta is the by-products of gari speeled garri or gary. To obtain the sievata, the tuber is peeled, crushed and then fermented and the resulting products are then sieved and roasted. The sievata represent 15-17% of the root in weight (Nwokoro et al 2005).

The cassava stumps are the end trimmed of the cassava tuber as they are manually prepared for onward transmission in the rotary waste and peeling (Aro, et al 2010). The liquid pressed out of the tuber is the cassava whey obtained after it has been crushed mechanically. The whey and the pomance may mix together to form an affluent (slurry) (Aro, et al 2010) and the discarded tubers are the tuber that fail to meet the quality standard and can be used for animals feeding. They are sometimes still attached to the products and may contain more fibre. They may also be mixed with stumps (Scapinello, et al 2005).

DEFICIENCIES IN CASSAVA PEELS

Fresh cassava peels have three main deficiencies. They spoil very quickly, contain phytate and large amount of cyanogenic glycoside. They should be processed in order to reduce the acid potential and physical content and to preserve their nutritive quantity (Obo, 2006); Salami, et al 2003; Tewe 1992; Adeogbola et al, 1988). According to them, different processes are effective in reducing the acidity which their process yield good result include sun-drying, ensiling and soaking plus sun-drying. Ubalua, (2007)' Obo, (2006) pointed out that solid fermentation of a mixture of cassava peels and waste water from fermentated cassava palp with saccharonyces cerevisiae and lactobacillus spp resulted in a product with a higher protein content, lower cynogenic glycoside and lower phytate content.

The pomance (Bagasse, bran or pulp) contain less cyanogenic glycoside than the peels. It can be dried or ensiled by grounding it with the addition of either 0.5% salt or rapidly fermentable CHO such as grind maize or molleses before being replaced in aerobic condition in pits or plastic bags. Urea and minerals can also be added (Ubalua, 2002). Asaolu, (1988) cited by smith 1988 observed that under the condition, cassava peels silage after 21 days was light brown in colour, firm in texture and has a pleasant odour and the PH was 4.4 and no fungal growth observed. Asaolu, (1988) cited that by Smith (1988) observed that good quality silage can be obtained after chopping the peels to equal length of about 2cm for easy compaction and wilting for 2 days to reduce moisture content from 70-75% of about 40%.

ENVIRONMENTAL IMPACTS ON CASSAVA PEELS PRODUCTION

Cassava processing produces large amount of wastes and is generally considered contributing significantly to the environmental pollution (FAO 2001). Aro, et al (2010) stated that starch production unit processing, process 100 tones of tuber / day and has an output of 47 tones of fresh by-product which may cause environment problem when left in the sun-drying of processing disposed of.

In Nigeria, according to Aro, (2010); Adebayo, (2008), cassava peels are usually left to rot away or burnt away to great space for the accumulation of more waste heaps which emit carbon dioxide and produce a strong offensive smell. Panday, et al (2000); Ceneda, et al (1996) and Barang, et al (2000) showed that cassava peels and pomance, large amount of cyanogenic and biodegradable organic matter respectively may cause surface water pollution if they are stored under heavy rain or simply disposed off in surface waters. FAO (2001), stated that the pressure of a large processor or several small processors can cause the eutrophication of slow moving water system, notably during the dry season. Cassava processing seems to affect ground water supply except occasionally in the immediate surroundings of the processing units due to leaching through the soil. Starch extraction required large volume of water and may cause water depletion but in most areas, the production is minimized by proper wastes treatments. Panday, et al (2000) also was of the view that the use of cassava by-products as feedstuff or as an alternative substance for biotechnological process is a potential way to alleviate environmental issues.

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CASSAVA PEELS TRANSFORMATION

Transformation of cassava peels into light quality feed holds large potentials for Nigeria economy and struggle to meet rapidly rising demand for animal source production (CGIAR Publication). Nigeria estimated about 50 million-cassava peels waste per year and could produce up to 15 million tones of cassava leading to shorts falls in supply of animal feed and eventually creating insufficient feeds for livestock.

A research proposal in collaboration with other organizations by International Livestock Research Institutes of Tropical Agriculture with International Potato Centre Research Programme on Root Tuber and Banana and others working closely with private sectors partners, was led by the effort of the ILRI to develop and improve innovative technologies for processing cassava peels into high quality livestock feed. This enabled the private sectors to become independent and take part in the related technologies and product uses.

The workshop held at IITA by representative of the private sectors organizations, government, NGO's and research Institutes to discuss ways to enhance opportunities for high quality cassava peels processing and use at scale in Nigeria had positive result on environment, business opportunities, livelihood of small scale processors and the availability of animal feeds. They aired also at improving the uses and development of share of vision for how changes will happen towards cassava peels transformation to enable its uses at scale.

At the end of the workshop, they agreed on ways to collaborate or research on wet cassava peels and high quality mashes, uses, at scale. This workshop also emphasized on how to turn cassava peels into useful production instead of just throwing them away as wastes.

CHALLENGES OF CASSAVA PEELS PROCESSING

Okike on his presentation during IITA cassava peels transformation scale workshop detailed some of the problems associated with cassava peels as production cost of transformation to animal feed, the competitiveness versus maize in energy conversion and observed obstacles facing scale of innovation, scale of strategy and key partner for scale. According to www.cassavaprocessing, workshop, the development of rich picture of profitabilities offering by cassava peels usage and the challenges facing the cassava peels processing innovation was showcased. The high quality cassava peels transformation into high quality animal feed ingredient that substitute for 15-16% of maize in livestock or fresh feed.

IITA stated that a fraction of feed generated for cassava peels is higher in energy and low in fibre content for livestock and fish which could generate money and create employment for unemployed youths. www.radionigeria.org.ng stated that states and local governments should invest in the new technology of turning cassava peels into wealth.

RECOMMENDATIONS

In view of the importance of cassava peels to the national economy, the following recommendations are made:

(1) Cost of transformation of the peels to animal feed should be reduced to replace maize as a source of energy.

(2) The obstacles facing scale of innovation, scale of strategy and key partners of scales should be removed.

(3) Unemployed youths should be educated on the importance of cassava peels and advised to adopt the business as an opportunity for living.

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