



Detoxification, Diversification and Branding of Local Food Commodities

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ABSTRACT

The study examined detoxification, diversification and branding of local food commodities need for increased consumer awareness on patent and job creation to end hunger and poverty. Nigerian families especially the teeming population of youths in the last decade has suffered massive unemployment rate resulting in prolonged hunger, poverty and frustration. Hence, the creation of awareness on detoxification, diversification and branding of the local food commodities that could create employment reduce hunger and poverty among the population. The study aimed at creating awareness on detoxification, diversification and branding of available local food commodities through processing, creating employment opportunities to eradicate poverty, end hunger and enhance longevity and quality of life. The paper examined the skill in branding of food commodity which involves the processes, the commodity will undergo before being sold or traded in the market; explored detoxification as a process of removing unwholesome substances from food during processing while diversification of food commodities via biodiversity and processing into different forms and brands. Three major local food commodities (cassava, plantain and fluted pumpkin) were the focus of this study because of availability and rate of consumption in Umuahia environment of Abia State. The various methods of processing into different forms and brands were examined. The study identified peeling, slicing, dewatering, drying and milling in cassava and plantain as major skills, whereas plucking, cutting, drying and shredding for pumpkin is a major skill such that the different chains involved in processing of these food commodities (cassava, plantain and green vegetable (Pumpkin) as a brand for consumption could be very lucrative if commercialized especially with nutritional information on the removal of toxic substances (detoxifications). The process of branding each product has its own skill as well as detoxification and diversifying into various sub products and diet formulation which is another skill and entirely new area of research. Established companies could buy the franchise or support the production thereby expanding the brand and creating more job opportunities.

Keywords: Branding, Detoxification, Diversification, Hunger, Poverty, Unemployment.

INTRODUCTION

Despite the abundance of staple food commodities and fresh leafy vegetables in our local communities, poverty, hunger, malnutrition and unemployment are still very observable and on the increase (Otitoju *et al.*, 2014). The need for economic empowerment as a result of decreasing access to white collar jobs and inability of young graduates to acquire a source of livelihood necessitated a reawakening of Nigerians to revamp their economy based on available natural resources. Nigerian families especially the teeming population of youths in the last decade has suffered massive unemployment rate resulting in prolonged and enlarged poverty ratio. It is not unlikely that most of the crises manifesting itself in form of various terrorists' activities could be as a result of hunger, poverty, idleness and frustration. Observations from the current trends in socioeconomic activities across communities and within the country is not encouraging. Young graduates are vulnerable to crimes of varying magnitude just to find a source of activity to earn a living. This study was conceived as a proviso to find independent engagement and job opportunities for a growing populace as a way to end hunger and find a lasting solution to poverty. Food Security only be guaranteed if food commodities are readily available in varying forms and brands and wholesome for consumers.

Branding of food products is a process of creating an identity designed to signal a perfection of a specialty for the originality of a product. A brand name is term, design, symbol or any other feature or characteristics which distinguishes a product from the perception of customers. Detoxification is a process of removal of toxic substances and or anti nutritional factors for the purpose making the food products wholesome for consumption. This is mostly achieved during processing or food preparation. Similarly, diversification of local food commodities as used in this study is a reallocation of various brands and sub-products to a specific food commodity other than the known products perceived to be an original bi-product (s) from the raw material. For instance in Nigeria the known bi-product of cassava tuber is either fufu and or garri made in paste, stiff porridge for swallow.

Cassava (*Manihot esculanta* Gratz) is a major root crop and important staple food for millions of people in developing world (Falade and Akingbala, 2010). Cassava root is a high energy food with high water and carbohydrate on fresh weight basis and 80-90% on dry matter basis (Estelle, 2013). Two major factors limit the utilization of cassava roots and leaves as human and animal food stuff. The first one is that it is low in protein and vitamins; secondly it contains cyanogens glycosides (linamam and lotanstratin) which on hydrolysis release hydrogen cyanide. However,

processing is known to eliminate about 90% of the total cyanide content of cassava material cassava is a potential crop for the food and fermentation industries. The presence of two cyanogenic glycosides, Linamarin and Lotaustralin, in cassava is a major factor limiting its use as food or feed. Traditional processing techniques practiced in cassava production are known to reduce cyanide in tubers and leaves. Nigeria is one of the world's largest production of cassava which is consumed mainly as garri and fufu. In recent times, efforts have been made to diversify cassava roots with high quality cassava flour (HQCF) it is intended to be used as raw material in food and beverages industry for the manufacture of pastries, biscuits, noodles, as binding and thickening agent in soups and sauces. It is also suitable in the manufacture of pharmaceutical and glucose syrup. Another important potential use is in composite wheat flour in high grade food such as bread, cake etc. For this study, two varieties of Provitamin-A high quality cassava was branded, detoxified and diversified into confectionaries such as bread, donut, cakes, chin-chin, meat pie and fish rolls which is an advancement in confectionary market economy (Preeti Ahluwalia, 2017).

Plantain (*Musa* family) Cooking bananas are banana cultivars in the genus *Musa*, whose fruits are generally used in cooking. It is a major food staple across West, Central and East Africa and also Central America, the Caribbean Island. They may be eaten while ripe or unripe and are generally starchy. Some cooking bananas are also referred to as green bananas or plantain. All modern plantain cultivars have three sets of chromosomes (i.e. they are triploid). May be hybrids derived from the cross of two wild species: *Musa acuminata* and *Musa balbisiana*. The currently accepted scientific name for all such crosses is *Musa paradisiaca* (Taxonomy Advisory Group (TAG, 2015). Not much of toxic substances is recorded in plantain but it contains high levels of serotonin and dopamine. Serotonin plays a major role in the etiology and treatment of depression, while dopamine is responsible for the

Drying

Drying is a widely practiced technique to eliminate cyanide and improve the shelf life of cassava tubers. Dehydration is achieved either through sun or oven drying. Sun drying has been reported to be more effective than oven drying, as the former allows more contact time between linamarase and the glucosides and also retains water, an essential substrate for linamarase, for a longer time in the tuber, and reduces cyanide content progressively (Maduagwu and Adewale, 1981 Padmaja, 1995).

Boiling/Cooking

Cassava tubers are eaten after being cut into small pieces and boiled in water. This is also the main detoxification process in the preparation of a cassava salad in Eastern Nigeria (Padmaja, 1995). The percentage reduction of

enzymatic browning when plantain is cut (Odiaka *et al.*, 2010).

Fluted Pumpkin (*Terraferria occidentalis*) is a tropical vine grown in West African as a leafy vegetable and for its edible seeds. The common name for the plant includes fluted gourd, fluted pumpkin (Ugu). It is indigenous to Southern Nigeria and grows in many nations of West Africa but mainly cultivated in Igbo land and Calabar. It is used primarily in soups and herbal medicine. The seed is considered as oil seed and contains high levels of potassium and iron about 27% crude protein and 53% fat. The leaves contain high amount of anti-oxidant, hypo-protective and anti-microbial properties (Kayode and Kayode, 2011).

MATERIALS AND METHODS

Freshly harvested Pro-Vitamin A cassava, plantain and fluted pumpkin leaves were purchased from an open market, cleaned and weighed. 50kg of cassava tuber (#2000.00), 30kg of plantain (#2000.00) and #2000.00 of fresh Ugu leaves were measured for this study. The following tools were used: knife, basin, drainer, tray and sieve mesh.

The processing of the three food commodities in this study is presented in a flow chart. Each stage of process spells out what happens with the commodity. It is possible for these various chains of activity to form an independent skill for entrepreneurship.

RESULTS AND DISCUSSION

Cassava Detoxification and Diversification methods

Cassava is processed in many different ways to be used in a variety of snacks and main dishes. Many times the processing techniques are combined to either improve the end product or further reduce the amount of cyanide and/or phytate. Figure 1 shows the technique for the detoxification and diversification of cassava.

cyanide in cassava tuber depends on the boiling time, volume of water used and the tuber size, as cyanide was undetectable after 35 minutes boiling (Padmaja, 1995).

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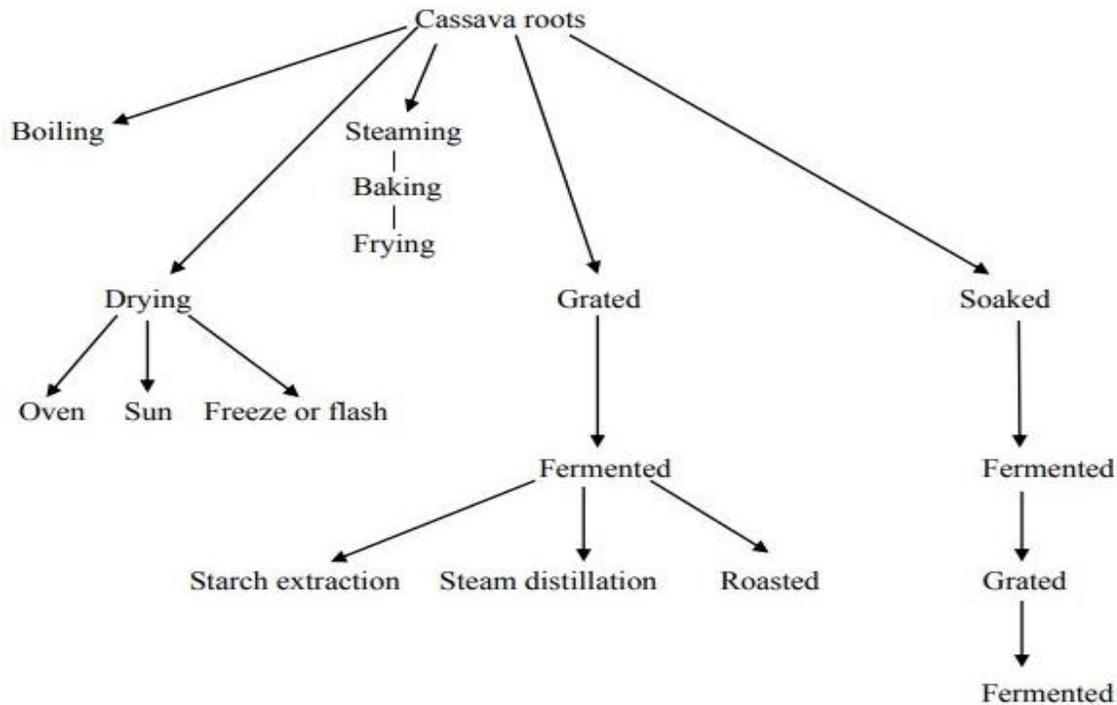


Figure 1: Technique for the Detoxification and Diversification of cassava

The processing methods generally adopted include drying, boiling/cooking, soaking and fermentation (Padmaja, 1995).

Boiling/Cooking

Cassava tubers are eaten after being cut into small pieces and boiled in water. This is also the main detoxification process in the preparation of a cassava salad in Eastern Nigeria (Padmaja, 1995). The percentage reduction of cyanide in cassava tuber depends on the boiling time, volume of water used and the tuber size, as cyanide was undetectable after 35 minutes boiling (Padmaja, 1995).

Soaking/Leaching

Soaking in water has been reported to leach out the soluble cyanogenic glucosides from cassava. Soaking cassava root in water for one day decreased the cyanide from 108.2mg/kg to 59.5mg/kg, while soaking for five days reduced it further to 2.9 mg/kg (Bourdoux *et al.*, 1982). The preliminary soaking treatment helps to hydrolyze the cyanogenic glucosides in tubers. The softening achieved during soaking also helps in reducing the labor involved in grating (Lancaster *et al.*, 1982).

Peeling

Most methods of cassava processing for human consumption begin with peeling the hard root cortex from the parenchyma. Generally, the peels contain much higher cyanide than the pulp. Hence, peeling is an effective way of reducing the cyanide content of processed cassava. Peeling

has been reported to reduce at least 50% of the cyanide in whole cassava tubers (Tewe, 1991).

Cassava Diversification

Processing of cassava for value adding has centred mainly on production of fermented and non-fermented flours for making porridge (Laswai, 2006). Such flours could be blended with cereal flours to improve acceptability of the cassava-based porridges. Exact proportions of these blends have not been fully established. Cassava has also been used in baked products (eg bread) and fried products like doughnuts, buns and chapati (a pan fried unleavened flat round wheat-based product), although not to the extent of the stiff porridges (Laswai, 2006). Another area of utilization of cassava is in the starch industry for food and non-food uses. This product can be obtained from the fresh dried cassava. The easiest form of extraction of this cassava starch is from the fresh cassava using graters to grate the cassava into a fine paste and squeeze (Laswai, 2006).

Plantain Diversification

Plantain (*Musa spp*) may be processed into many products at different stages of physiological maturity; unripe, ripe, overripe or in a number of ways such as frying, grilling, boiling and drying. According to Demirel and Turhan (2003), drying adds value to plantain in addition to preservation. Moisture removal from plantain seems to be an appropriate and economical means of preserving *Musa spp*, resulting in shelf stable and convenience products.

Currently, unripe plantain flour is being processed into a thick paste product known as 'amala' in the western part of Nigeria, which is medically recommended for diabetic patient (Adeniji *et al.*, 2006). Ripe plantain powder is used in bakery and confectionery industries, in infant diets and the treatment of intestinal disorders (Adeniji *et al.*, 2006). Improved cultivars of plantain may provide high quality whole flour from the entire fruit for livestock feed, which may eventually provide protein in human diet from consumption of meat and other products of livestock (Thompson, 1995). Such flour may be employed in traditional dishes for human consumption based on their nutritional profiles. Although, there is need to investigate the application of whole Musa flour in baking and confectioneries from the point of view of their pasting properties but that notwithstanding it has recorded success when used in addition to the conventional wheat flour. The use of entire fingers of plantain could be a rapid approach in flour production with improved levels of nutrients, especially minerals, which are concentrated in the peel (Izonfuo and Omuaru, 1988).

The ripe plantain is utilized in a multitude of ways in the human diet, from simply being peeled and eaten out of hand to being sliced and served in fruit cups and salads, sandwiches, custards and gelatins, being mashed and incorporated into ice cream, bread, muffins and cream pies (Adeniji *et al.*, 2006). Ripe plantains are often sliced lengthwise, baked or boiled, and served (perhaps with a garnish of brown sugar or chopped peanuts) as an accompaniment for ham or other meats. Ripe plantain may be thinly sliced and cooked with lemon juice and sugar to make jam or sauce, stirring frequently during 20 or 30 minutes until the mixture jells. Whole, peeled plantain can be spiced by adding them to a mixture of vinegar, sugar, cloves and cinnamon which has boiled long enough to become thick and then letting them cook for 2 minutes (Chandler, 1995).

Plantain puree is important as infant food and can be successfully canned by the addition of ascorbic acid to prevent discoloration. The puree is produced on a commercial scale in factories close to plantain fields and packed in plastic-lined 10 cans and 55-gallon metal drums for use in baby foods, cake, pie, ice cream, cheese cake, doughnuts, milk shakes and many other products (Ogazi, 1996).

Diversification of fluted pumpkin leaves

Storage of freshly harvested leaf vegetables of *Telfairia occidentalis* Vegetables and fruits are usually stored in cold storage, and their shelf life ranges from few weeks to months. The energy required for cold storage is a major factor in designing and using of cold storage systems. However, some researchers have adopted drying as an alternative means of storing fruits and vegetables. Drying, however, has its challenges like loss of valuable soluble constituents, colour changes, nutrients diminishing, and appreciable loss of original taste. Efforts to obviate some of these challenges have led to the use of dewatering

impregnating soaking, among other pre-treatment techniques prior to drying (Igbozulike, 2015).

Conclusion

Flakes made from cassava, crispy sweet plantain chips, plantain flour were detoxified, diversified and branded. This would add value to products, help the low income generate income get the unemployed employed to alleviate poverty, put food on the table of many and end hunger in the families and society at large.

Recommendations

The following recommendation were preferred for the study

1. The populace should be educated on the foods that has toxins and how to detoxify them for healthy eating
2. The production/processing of local commodity like cassava and vegetables should be diversified to encourage varieties of products for the consumers.
3. The diversified products should be properly branded and packaged to make it look appealing for consumers to buy.
4. Workshop; Training, conferences, etc. should be organized and conducted for the population to know and understand how to be self-employed to generate income.
5. Value chain in the processing and preparation of these local commodities should be encouraged to make provision for more job opportunities towards reducing poverty and hunger.

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