TEST MARKETING FOR VALUE-ADDED ROOT AND TUBER BASED PRODUCTS IN IKWUANO LOCAL GOVERNMENT AREA OF ABIA STATE, NIGERIA

Ewuziem, J.E., Aniedu, C., Oti, E and Onyenobi, V.O

National Root Crops Research Institute Umudike, Nigeria
Email: juziem2000@yahoo.com, enyinnaya4u@gmail.com

ABSTRACT

The study was conducted at different markets in Ikwuano LGA of Abia State to test-market selected value-added root and tuber based products, developed at National Root Crops Research Institute, Umudike. Its specific objectives were to assess acceptability of the products by the consumers; identify the marketing channels for the products; estimate the profit margins of value addition in selected root and tuber products and determine the benefit cost ratio of value addition. The products were prepared in the Post-harvest Technology Programme of the Institute, using the recommended recipe developed for each of the products. The products were properly packaged, placed at variety shops and taken to Ndoro market for sale on market days, usually once a week for six (6) weeks. Local vendors were also used in the marketing. A simple questionnaire was used to elicit information from consumers. The results were determined with the use of descriptive statistics and gross margin analysis. Burger and meat pie were accepted by more consumers among the baked products while meat pie and ginger drink gave the consumers the highest levels of satisfaction. All the products were profitable; however, meat pie gave the highest profit margins while ginger drink had the least cost advantage. In terms of percentage volume of sales, *Chin-Chin* ranked 1st followed by ginger drink and cocoyam crisps at 2nd and 3rd respectively. It is therefore recommended that value-added products of root and tuber crops should be commercialized since they are profitable and likely to be accepted by consumers. This will create markets and increase demand thereby eliminating wastage of root and tuber crops in Nigeria.

Keywords: Roots, Tubers, Value-addition, and Ikwuano LGA

INTRODUCTION

The majority of the population in Nigeria lives in rural areas and depends on small scale agriculture for food and income (Nwajiuba *et al.*, 2011). Faced with limited prospects for rural industrialization, smallholder agriculture remains the major engine of rural growth and livelihood improvement for some time. Meeting the challenge of improving rural incomes in Nigeria will require some form of transformation out of the semi-subsistence, low-input, low-productivity farming systems that currently characterizes much of rural Nigeria (Onubuogu and Onyeneke 2012), into a robust manipulation of the various actors in the commodity value chains to achieve the needed cohesion among the various actors along the chain. In this regard, the processing component of the value chain must be reinvigorated for greater efficiency especially for the root and tuber that form the staple food and main source of calories for an estimated 700 million poor people in Africa, Asia and Latin America (FAO, 2013).

More than half the production in fresh form is for human consumption. The most widely produced and consumed is cassava, but other important crops in this group include yam, sweetpotato, cocoyam and ginger. Roots and tubers play an important role in the agro-economies of most African countries, contributing significantly to basic food requirements in urban and rural areas as well as having some non food uses (CTA, 1999). In some localities, the marketing of these crops are poorly organized leading to substantive losses due to post-harvest deterioration leading to poor revenue accruing to the farmers

To meet the rising demand for food both on and off the farm, rural families will have to exploit the production potentials of their crops to the utmost, partly by reducing the post-harvest losses caused by dehydration, spoilage and pest damage (Wheatley, 1995). Furthermore, farmers will also have a strong incentive to convert what cannot be readily sold or consumed at harvest into marketable products. To realize the sizeable potential of root and tuber crops for contribution to socioeconomic development in rural areas, a combination of efficient, sustainable crop production with new or improved products and markets is required. They therefore require specialized post-harvest handling, storage and preservation techniques in order to minimize losses, extend shelf-life and maintain quality.

Product development (value addition) means generating ideas for new or improved products, selecting the best ideas and developing these into commercially successful products. Agricultural produce can be used in different forms through the processes of value addition in the conversion of the produce into more conversant, diversified and acceptable forms to the consumer (Malcom, 1977). Value addition translates to increased revenue to the farmer as expressed by Yohanna and Abinuke (2004) using cassava as an example. Lending support to value addition, Onoja and Audu (2005) stated that solving the problem of agricultural productivity and rural development through processing and utilization will go a long way in poverty reduction and elimination of hunger. Some root and tuber crops find their importance in confectionery and medicinal uses such as ginger and turmeric. However, the high consumption of root and tuber crops has not translated to enhanced revenue to the farmers because farmers sell at giveaway prices for fear of total loss through post-harvest deterioration. Also, in line with the current emphasis on value addition as an integral part of the commodity value chain, it is a means of enhancing the economic benefits accruable to the farmers.

New product development process consists of a series of screenings and evaluations of the idea, the concept, versions of the prototype and finished product, package structure and graphics, plant and/or equipment (if new), and the marketing programme. Having completed development, market testing follows. Market testing refers to evaluation of the entire launch programme through taking the finished product and marketing programme to the final consumer, and testing consumer reaction to the new product. With new products that do not require significant investment in production technology, plant, and equipment the best option is to ‘‘roll and fix.’’ This means that the product will be initially launched in a limited geographical area, and roll the product into new markets while gathering consumer and trade feedback, making necessary adaptations to the programme, and building up production capacity as demand increases.

In recent times, government has encouraged the use of root and tuber crops to produce a wide range of industrial products such as ethanol, glue, glucose, syrup, biscuits, *chin-chin*, cake, bread

(Eze *et al*., 2011). To achieve part of its mandate, the post-harvest programme of National Root Crops Research Institute (NRCRI) Umudike, developed some processing technologies for root and tuber crops in order to curtail their perishability and add value to these crops. Food items such as cassava fufu flour, high quality cassava flour for confectionery production and other products were developed (Aniedu and Oti 2011; 2009; 2008; 2007). The essence is to ensure that these crops can be put to wider uses in the home, for income generation and possibly for export purposes.This is a way of diversifying the market for root and tuber crops, thereby creating demand and reducing loss.

However, value-addition has been largely limited to small-scale processing for household consumption or sale in traditional markets using labour intensive, inefficient and unhygienic processing techniques which result in products of poor quality.Cassava has long been a traditional household food security crop, but its potential for agro-industrial applications is increasingly being recognized, and this opens up important income generating opportunities for farmers. Also, Yams, sweet potato and ginger are assuming increasing importance as cash crops. In this regard, training and technical advice in good post-harvest handling practices and storage methods helps to extend shelf-life, maintain quality and add value, thereby enabling farmers to increase their incomes from improved market opportunities.

This can only be achieved when the value-added products meet the taste and quality expectations of the consumers as a necessary step to scaling up. It therefore becomes necessary at this stage to begin the test marketing of the value added products of root and tuber crops.

This study therefore sets out to achieve the following specifc objectives: assess the acceptability of the products among consumers; identify the marketing channels for the products; estimate the profit margins of value addition in selected root and tuber products and determine the benefit cost ratio of value addition. The result will determine the marketability of selected root and tuber based value added products of NRCRI.

METHODOLOGY

Selected value-added root and tuber based products developed by NRCRI were used for the study. All the products were prepared at the post harvest technology programme of the institute, using recommended technology. The selected products include: *Chin – Chin*, Doughnut, Ginger Drink, Cake, Cocoyam crisps, Strips and Meat-pie. All the baked products were made from 100% High Quality Cassava Flour except Burger which had only 20% Cassava Flour inclusion. The products were sold at an open market using the Ndoro Market in Ikwuano LGA on the market days which is usually once a week for six (6) weeks, variety shops within the institute and university environment and to local vendors. Data were collected on quantity of each of the products sold in terms of acceptability, satisfaction and consumer reactions using a simple questionnaire. Also, data on the cost and returns from sales were collected. Data were analyzed using simple descriptive statistics and gross margin analysis. The gross margin model was specified thus;

$GM = TR - TVC$ ….. (1)

Where:

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

BCR = TR/TVC (BCR > 1 is profitable) …..(2)

RESULTS AND DISCUSSION

Acceptability

The work of Atala (1990) inferred that the appropriateness of any technology depends on its acceptability by the people. This informed the conclusion of Aniedu *et al* (2012) that if an innovation was not acceptable by the people, the time, money and efforts spent in developing the innovation and that spent in its disseminations must have been wasted. The result of the acceptability of the tested products indicates that all the products were acceptable. However, Meat pie and Burger had the highest acceptability, followed by Cakes as shown in figure 1. This means that these products were able to give them greater utility than others. Ginger drink, which is the only drink among the selected products, recorded high acceptability due mainly to taste and medicinal values. So also are cocoyam crisps which have been popularized by NRCRI in the past.

Satisfaction

Consumers are gradually changing their habits and life styles, appreciating the need for convenience food (Mohammed and Nahar, 2013; Gofton and Ness 1991). Peattie (1995) stated that consumers need 'convenience' in every product for their daily survival due to increasing product price. Meat pie gave the consumers the highest satisfaction, followed by Ginger drink and Burger. These products conform to the above postulations concerning convenience. Consumers always weigh the amount of the money they spend on a commodity or service with the value of the product or service to place their level of satisfaction. This result shows that the products that received higher satisfaction are likely going to receive higher patronage and will easily compete with the already existing confectioneries in the market.

Marketing channels

The marketing channels identified for the value added products include; rural markets, variety shops, local vendours and consumers. The products were prepared at the post harvest programme of the institute, the taken to the rural market; variety shop owners also buy to resell in their shops to consumers, also vendors buy to sell to travellers who may need convenience foods as they move in buses. The study further examined the volume of sales for each product in the different markets. The result for the rural market indicates that *Chin-Chin* (CC) ranked 1st by recording the highest sales with 96% of the supplies sold off. This was followed by Ginger Drink (GD) with 91.4% sales and Cassava Meat Pie with 83.7%. In the variety shops, Ginger Drink recorded 100% sales to rank 1st, followed by *Chin-Chin* (98%) and Cassava Strips (90%). However, for the vendors, *Chin-Chin* had the highest sales volume with 95% of supplies sold. This was followed by Cocoyam Crisps (91.25%) and Cakes (90%).On the overall, *Chin-Chin* ranked 1st on the percentage sales in the markets, followed by ginger drink and Cocoyam Crips. This implies that *Chin-Chin*, Ginger drink and Cocoyam Crips are most likely to be absorbed faster than other root and tuber based value added products in the markets of the study area.

Profit Margins

The profit margins for the products as shown on table 2 indicates that Chin-Chin had the highest profit margin with a Benefit Cost Ratio (BCR) of 2.22 : 1, but its Total Variable Cost (TVC) was high, implying that one requires up to ₦15,000 to start Chin-Chin production as a business. Meanwhile, Ginger drink had the least TVC (₦1,700) with a BCR of I.76: 1, this means that to start the business of ginger drink production requires a little amount of money and appears most likely to attract the interest of the rural people due to its low capital requirement.

CONCLUSION

There are many opportunities to improve the traditional uses of root and tuber crops and introduce them into a wide range of new food and feed markets particularly in the rapidly urbanizing societies of the developing world. Exploitation of these opportunities has become imperative especially in Nigeria where the development of high yielding varieties of root and tuber crops, coupled with improved production technologies has resulted to increased yields. A concerted effort to realize the promise of these crops could give them a more central role to play in development. Wheatley (1995) had suggested that the key to fulfilling the potentials of root and tuber crops is to establish a strong link between small scale producers and new markets. Root and tuber crops are perishable and bulky; capital resources are scarce in rural areas and organizing market channels is complex. To overcome these obstacles require appropriate strategies and technology for post harvest processing and utilization. Value addition is a veritable means of reducing or eliminating wastage of root and tuber crops in Nigeria. In addition to creating market and demand, it will reduce unemployment especially among the women and vulnerable groups in the society. The root and tuber based value added products of National Root Crops Research Institute Umudike are acceptable and profitable within host Local Government Area and can compete favourably with similar products in the market. It is therefore recommended that additional efforts should be made to popularize these products in our local markets.

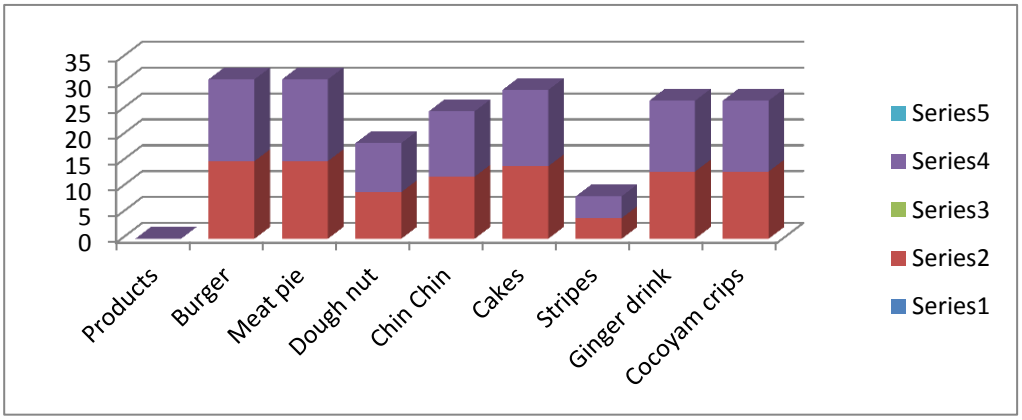

Figure 1: Mean acceptability of value added product of NRCRI Umudike at the various markets in Ikwuano LGA of Abia State Nigeria

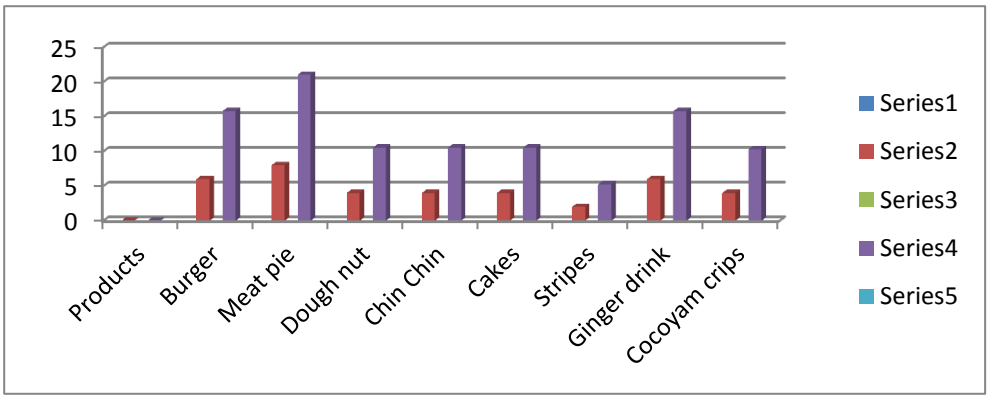

Figure 2: Level of Satisfaction derived by Consumers of value added products of NRCRI Umudike

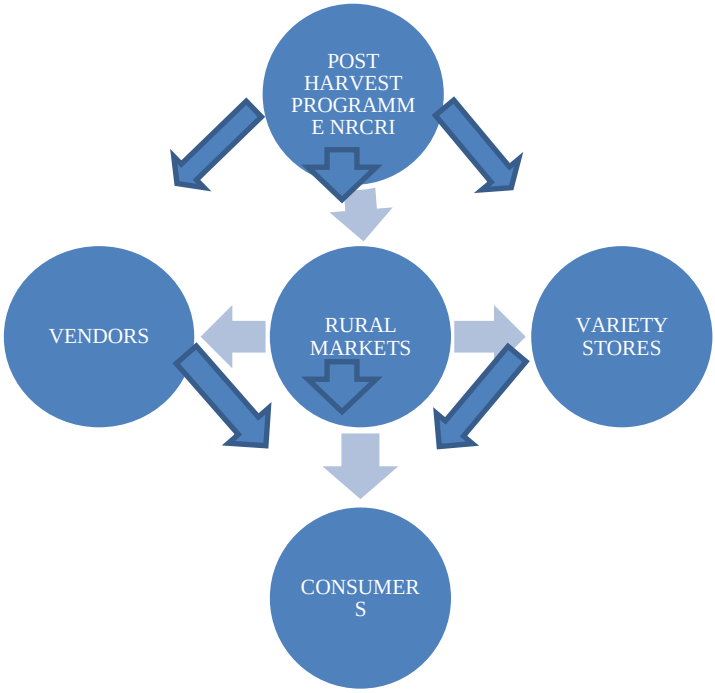

Figure 4: Marketing channels for value added products of NRCRI

Table 1: Frequency Distribution of the marketing outlets for Root and Tuber based value added products are in the study area.

Products	Rural market				Variety shops				Vendours				Over all Rank
	Qty offered	Qty Sold	%	Rank	Qty offered	Qty Sold	%	Rank	Qty offered	Qty Sold	%	Rank	
GD	70	64	91.4	2nd	50	50	100	1st	45	40	88.9	4th	**2nd**
CC	100	96	96	1st	100	98	98	2nd	80	76	95	1st	**1st**
D	100	70	70	6th	80	67	83.75	5th	80	64	80	8th	6th
C	80	60	75	5th	60	46	76.7	8th	70	63	90	3rd	5th
CMP	80	67	83.7	3rd	50	41	82	6th	70	59	84.28	5th	4th
20% CB	80	54	67.5	8th	50	40	80	7th	50	41	82	7th	7th
CCR	100	77	77	4th	80	70	87.5	4th	80	73	91.25	2nd	**3rd**
CS	100	68	68	7th	80	72	90	3rd	80	67	83.75	6th	5th

GD = Ginger Drink, CC = *Chin-Chin*, D = Doughnut, C = Cakes, CMP = Cassava Meat Pie, 20% Cassava Burger, CCR = Cocoyam Crisps, CS = Cassava Strips

Table 2: Gross margins for different Root and Tuber based value added products in the study area.

PRODUCTS	TVC	TR	GM	BCR
GINGER DRINK	1,700.00	3,000.00	1,300.00	**1.76: 1**
CHIN- CHIN	6,750.00	15,000.00	8,250.00	**2.22: 1**
DOUGHNUT	6,900.00	10,000.00	3,100.00	1.45: 1
CAKES	7,100.00	12,000.00	4,900.00	1.69: 1
MEAT PIE	5,860.00	7,500.00	1,640.00	1.28: 1
20% CASSAVA BURGER	5,210.00	7,500.00	2,290.00	1.44: 1
COCOYAM CRISPS	11,600.00	17,500.00	5,900.00	1.50: 1
STRIPS	5,050.00	9,100.00	4,050.00	1.80: 1

TVC= Total Variable cost, TR= Total Revenue, GM= Gross Margin, BCR= Benefit Cost Ratio

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