



Post Harvest Skills In Establishment Of Small And Medium Scale Enterprise Required By Retirees In Cocoyam Processing In Makurdi Metropolis Of Benue State, Nigeria.

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ABSTRACT

The study investigates post- harvest skills in establishment of small and medium scale enterprise required by retirees in cocoyam processing. The study was carried out in Makurdi metropolis of Benue State, Nigeria. Survey research design was adopted for the study. Three research questions and two hypotheses were formulated to guide the study. The population of the study was 112 made up of 91 farmers and 21 agricultural extension agents. There was no sampling. The instrument used for data collection was a 22 items structured questionnaire titled “Cocoyam processing skills questionnaire” (CPSQ) developed from literature reviewed. The Cronbach Alpha method was used to determine the internal consistency of the instrument which yielded a reliability co-efficient of 0.85. One hundred and twelve (112) questionnaire were administered and retrieved for data analysis (mean, standard deviation were used to answer the research questions, while t-test was used to test the null hypotheses at .05 level of significance). Findings from the study revealed that respondents rated all the items as required by retirees for the establishment of small and medium scale enterprises (SMEs) in processing cocoyam in commercial quantities into flakes and chips. It was recommended amongst others that workshop should be organized for retirees where they will be exposed to skills required for commercial processing of cocoyam. It was concluded that the enabling environment for small and medium scale enterprise for crop by-products such as cocoyam processing is important for self- reliance of retirees.

Keywords: Cocoyam processing, post- harvest skills, small and medium scale enterprises (SMEs)

INTRODUCTION

Cocoyam belongs to the family *Araceae* and in the group of monocot plant. Cocoyam (*Colocasia esculenta*, Taro) and (*Xanthosoma sagittifolium*, Tannia) is cultivated mainly for its corms and cormels. Food and Agriculture Organization (2013) reiterates that it ranks third in importance after cassava and yam among the root and tuber crops cultivated and consumed in Nigeria. Nwaobiala and Uchechi (2016) states that the edible cocoyam in Nigeria are both the Taro and Tannia and that it is nutritionally superior to other roots and tubers. Nigeria is the largest producer of cocoyam in the world with an annual production of 5.49 million metric tonnes, equivalent to 45.9% of world production and 72.2% total output of cocoyam in West Africa (National Root Crop Research Institute, 2005).

As explained by Nkematu (2006), cocoyam has broad leaves in the long stem attached to a corm which grows in the soil in the cormels. The cormels are of great economic and nutritional importance in the study area. Edet and Nsikak (2004) stated that cocoyam can be processed into several edible substances which are highly digestible and suitable for making confectionaries. Sefa and Sackey (2002) asserts that cocoyam leaves contain a lot of minerals, vitamins, thiamine and proteins used as nutritious spinach. The underground cormels which are the major economic part provide easily digestible starch and are often

used as substitute for yams and plantains when these become scarce in the dry season. Since cocoyam tolerates shade, the crop is frequently grown in intercropping systems together with perennial crops such as banana, coffee and oil palm. The corm and cormels of cocoyam which are the major economic part contains about 15 to 39% carbohydrates, 2 to 3 % of protein and 70 to 77% water. It has nutritional value comparable to potato but easier to digest. (Sagoe, 2006). Cocoyam flakes are part of food consumed regularly by people in the study area.

The National Root Crop Research Institute (2005) maintained that cocoyam flakes is one of the products of cocoyam which is normally consumed by many household and could be baked into biscuits or pellets for livestock feeding as concentrates. Ukom *et al* (2016) explained that in post- harvest activities of cocoyam, the shape and size are altered into new product by improving its handling and quality. Cocoyam is usually processed by boiling, roasting and deep- fat frying. However, heat processing of cocoyam tubers reduced their carotene oil content, specifically in fried and oven-dried methods. Boiling and roasting lead to a better retention of carotenoid. In the context of this study, post- harvest skills entails cocoyam processing which involves different activities designed to alter the shape and size of cocoyam into flour and chips in order to improve its keeping quality for future use.

As reported by Ekele (2019), skill is knowledge and attitude which give rise to competency as a result of training. Skills in the emerging technologies related to processing are therefore required in processing of cocoyam. Eke-Okoro (2005) suggests that the procedures involved in processing of cocoyam include-making the quality of flour and chips better than they use to be, economy of time in processing, processing enough for sale, involving simple technology in preservation and processing and storage of cocoyam flour and chips. Usually, the processing of cocoyam is carried out by small and medium scale enterprises (SMEs) that consists of few workers (between 3-6) individuals. Among these individuals are supposed to be retirees from public and private sectors of the economy. SMEs are less likely to be able to obtain bank loans, instead, they rely on internal funds, cash from friends and family, to launch and initially run their enterprises. SMEs establishment is considered an avenue for job creation which leads to unemployment reduction and entrench self- reliance among many people including retirees.

Retirees from government and private organizations who are supposed to work alongside the farmers may not possess the skills in processing of cocoyam. Probably, the absence of simplified processing technologies that could be managed by these retirees is a huge concern. This situation may have persisted because either the cocoyam farmers or the agricultural extension agents who are in the position to enlighten the retirees have failed in their duty. The researchers further observed that unavailability of large numbers of competent work force in cocoyam processing affects processing rate. The quantity and quality of cocoyam flakes and chips produced depends on the expertise involved in the processing procedures. Besides, the processing techniques of cocoyam are largely crude and are unable to meet the high demand of cocoyam processed by-products. Therefore, it is pertinent to investigate post- harvest skills required by retirees for the establishment of small and medium scale industries for cocoyam processing. Specifically, the study determines

1. SMEs skills required by retirees in commercial cocoyam processing into flour
2. SMEs skills required by retirees in processing of cocoyam into consumable flakes
3. SMEs skills required by retirees in processing of cocoyam into chips.

Hypotheses

HO₁: There is no significant difference in the mean ratings of the responses of cocoyam farmers and extension agents on SMEs skills required by retirees in commercial processing of cocoyam into flour.

HO₂: There is no significant difference in the mean ratings of the responses of two groups of respondents on SMEs skills required by retirees in processing of cocoyam into flakes.

METHODS

The study adopted survey research design. The study was carried out in Makurdi metropolis of Benue State, Nigeria. The population of the study consists of 112 made up of 91 cocoyam farmers and 21 extension agents in Benue State. There was no sampling, since the entire population was used for the study. A 22 items questionnaire titled “Cocoyam processing skills questionnaire” (CPSQ) was developed from literature and used for data collection. The instrument has a 4 point response scale of highly required (HR), Required (R), slightly required (SR), and Not required (NR) with corresponding values of 4, 3, 2 and 1. The instrument was subjected to face validity by three experts, one from Department of Crop Production, one from the Department of Agricultural Education, and one from the Department of Agricultural Extension all from University of Agriculture, Makurdi. Cronbach Alpha method was used to determine the internal consistency of the instrument. A reliability co-efficient of 0.85 was obtained. One hundred and twelve (112) copies of the questionnaire were administered to the respondents, retrieved and analyzed using mean (\bar{x}) and standard deviation to answer the research questions and t-test to test the hypotheses at .05 level of significance. Real limit of numbers were used as bench mark for decision making as follows: 0.5 – 1.49 (NR), 1.50-2.49 (SR), 2.50-3.49 (R), and 3.5 – 4.49 (Highly required).

RESULTS

Research question one. *What are the skills required by retirees in commercial processing of cocoyam into flour?*

Hypothesis one: There is no significant difference in the mean ratings of the responses of cocoyam farmers and extension agents on SMEs skills required by retirees in commercial processing of cocoyam into flour.

Table 1: t-test analysis of the mean ratings of responses of farmers and extension agents on SMEs skills required by retirees in commercial processing of cocoyam into flour (N=112; Farmers=91, Ext. Agent=21)

S/ N	Item skills	X ₁	SD ₁	X ₂	SD ₂	t-cal	t-tab	Remark
1	Soak and clean the tubers in water	3.40	0.30	3.52	0.82	0.67	1.96	NS
2	Boil for between 25-30 minutes	3.46	0.48	3.68	0.52	0.90	1.96	NS
3	Ensure complete water removal	3.37	0.71	3.55	0.64	0.76	1.96	NS
4	Cut and slice into 3mm to 3.5mm in thickness	3.53	0.40	3.62	0.67	-1.20	1.96	NS
5	Dry using dryer at the temperature of 55°C until cocoyam turns brittle	3.67	0.71	2.89	0.30	-1.82	1.96	NS
6	Manually grind cocoyam using hammer mill.	2.75	0.44	3.71	0.25	0.98	1.96	NS
7	Pulverize and sieve the cocoyam	3.36	0.57	2.79	0.84	0.73	1.96	NS
8	Bag and store in a cool dry environment	3.05	0.70	3.45	0.53	0.89	1.96	NS

Keys: X₁=mean of farmers, X₂=mean of ext.agent, SD₁=standard deviation of farmers, SD₂=standard deviation of ext. agent. t-cal= t- test calculated, t-tab= t-test tabulated. NS=Not significant.

Data analysis from Table 1 revealed that each of the 8 skill item had calculated t- value which ranges from -1.82 to 0.98 which are less than t table of 1.96 (two tailed test) at .05 level of significance and 110 degree of freedom. This is an indication that there was no significant difference between the mean rating of the responses of two groups of respondents (farmers and extension agents). The result of mean values had shown that retirees required all the item skills as rated by respondents.

Research question two. *What are the skills required by retirees in processing of cocoyam into consumable flakes?*

Hypothesis two: There is no significant difference in the mean ratings of the responses of two groups of respondents on SMEs skills by retirees in processing of cocoyam into flakes.

Table 2: t-test analysis of the mean ratings of responses of farmers and extension agents on SMEs skills required by retirees in processing of cocoyam into consumable flake, (N=112; Farmers=91, Ext. Agent=21)

S/N	Item skills	X ₁	SD ₁	X ₂	SD ₂	t-cal	t-tab	Remark
1	Peel and wash cocoyam to remove dirt	3.23	0.49	3.57	0.46	0.66	1.96	NS
2	Slice cocoyam and blanch in 0.1% sodium metal sulphide solution.	3.35	0.38	3.30	0.62	0.55	1.96	NS
3	Drain thoroughly and boil for about 25- 30 minutes	3.30	0.57	3.48	0.53	0.75	1.96	NS
4	Grind, weigh and mash the cocoyam	3.36	0.44	3.33	0.64	0.58	1.96	NS
5	Roll cocoyam and cut into 1mm shape and thickness	3.20	0.78	3.89	0.30	0.67	1.96	NS
6	Oven dry at 90 ⁰ c or dry under sun and allow to cool at room temperature	3.39	0.48	3.12	0.54	-1.78	1.96	NS
7	Pack in polythene bag and seal the packs in cartons.	3.00	0.30	3.84	0.67	0.81	1.96	NS
8	Ability to label and store in a cool dry place.	3.09	0.57	3.14	0.78	0.33	1.96	NS

Keys: X₁=mean of farmers, X₂=mean of ext. agent, SD₁=standard deviation of farmers, SD₂=standard deviation of ext. agent. t-cal= t- test calculated, t-tab= t-test tabulated. NS=Not significant.

Data analysis from Table 2 showed that each of the 8 item skills had calculated t- value which ranges from -1.78 to 0.81 which are less than the t- table of 1.96 (two tailed test) at .05 level of significance at 110 degree of freedom. This indicates that there was no significant difference in the responses of two groups of respondents on the SMEs skills required by retirees in the processing of cocoyam flakes. Also, mean values showed that all the respondents rated all the skills required for retirees.

Researches question three. *What are the skills required by retirees in processing of cocoyam into chips?*

Table 3. Mean ratings of respondents (farmers and extension agents) on SMEs skills required by retirees in processing of cocoyam into chips. (N=112)

S/N	Item skills	X	SD	Remark
1	Peel and wash the cocoyam	2.47	0.70	Required
2	Soak and slice the cocoyam at 1mm thick	2.80	0.36	Required
3	Separate the individual slices	2.94	0.72	Required
4	Mix the slice cocoyam with some quantity of salt	3.18	0.35	Required
5	Oven dry the separated individual slices after deep drying	2.53	0.45	Required
6	Cool the dry slices of cocoyam at room temperature.	3.11	0.63	Required

Analysis of data from Table 3 revealed that each of the 6 item skills have mean ranging from 2.47 to 3.18 signifying that the respondents required all the skills involved in processing of cocoyam into chips. The standard deviation ranges from 0.35 to 0.70 which further indicates that respondents are close in their responses.

DISCUSSION

Findings from Table 1 that respondents rated all the item skills on processing cocoyam into flour required was in line with the findings of Nwaobiala and Uchechi (2016) who in their study asserts that cocoyam processing into flour requires skills such as slicing, peeling, drying and milling into flour. This finding corroborates the findings of Ukom et al (2016). The authors reported that cocoyam flour can also be prepared by peeling, cutting, slicing and boiling for more than 25 minutes before sieving the pulverized cocoyam. Findings from Table 2 that retirees required all the skills in processing of cocoyam into flakes were in agreement with the opinion of Nkematu (2005) who confirmed that roll cutting of cocoyam into 1mm thickness and oven drying are important skills that are required. These findings were also in agreement with study by Sagoe (2006) and Eke- Okoro (2005) who in their separate study reported that draining the water from cocoyam is mandatory in processing of cocoyam into flakes. Findings from Table 3 that retirees required all the skills in processing cocoyam into chips were in consonance with study by Sefa et al (2002) and Das et al (2010). The authors reported that processing of cocoyam into chips involved mixing soaked cocoyam with some quantity of salt after slicing and after deep drying. This finding was further supported by Arubaluaeze et al (2014) who affirmed that the dry slices of cocoyam are dried at room temperature.

CONCLUSIONS

The study has provided information for retirees on the SMEs skills required for processing cocoyam into chips and flakes for commercial enterprises. The enabling environment for small and medium scale enterprise for crop by-products such as cocoyam processing is important for self- reliance of retirees. The government can make policy directives on processing of cocoyam that could enable the retirees benefit along the lines of skill required by them in this study. Since most of the retirees have worked and have varied experience in different field of educational background, this study is capable of motivating them to engage in commercial production of cocoyam.

RECOMMENDATIONS

1. Workshop should be organized for retirees where they will be exposed to skills required for commercial processing of cocoyam.
2. Small and medium scale enterprises in cocoyam processing should be established where retirees are taught on how to process cocoyam into flakes.
3. Technical equipment and technology involved in the processing of cocoyam into chips should be procured by extension officers through government assistance to be used in training retiree

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