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Plantain Processing Skills Needed by Secondary School Graduates for Self-Reliance in Enugu State.

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ABSTRACT

The study focused on plantain processing skills needed by secondary school graduates for self-reliance in Enugu State. The study was carried out in Enugu State using a survey research design. The study was guided by four research questions. The population for the study was 279 made up of 253 agricultural science teachers and 26 local plantain processing in Enugu State. A sample random sampling techniques was used to sample 86 teachers and the entire 26 plantain processing were used. Giving a sample size of 112 respondents. The instrument for data collection was a 27-item questionnaire developed by the researcher. The instrument was structured using a four-point rating scale for data collection and was validated by three experts, two from agricultural education programme and one from measurement and evaluation unit of Enugu State University of Science and Technology. Data was collected by the researcher with the help of two research assistants selected based on their familiarity with the study area. Out of 112 copies of the questionnaire distributed, 105 copies were properly filled and used for the study, and it represented 90.82% return rate. Mean and standard deviation were used to answer the research questions. The researcher found out that secondary school graduates highly need all the identified skills in processing plantain into dodo, flour, chips, and pudding for self-reliance in Enugu State. The study therefore concludes that, secondary school agricultural science graduates need to be exposed to skills in processing plantain. Based on the findings, it was recommended that the identified skills, in plantain processing be taught to students and encourage them to align with local processors for effectiveness to meet up with the standard required in the business world of today.

Keywords: Plantain Processing Skills, Secondary School Graduates, Self-Reliance, Enugu State

INTRODUCTION

Plantain (Musa paradisaca) is a staple crop grown in the Southern and Western part of Nigeria. Morphologically, it has parallel leaves which have herbaceous stem that are turgid. It is an important known crop in the kitchen which is rich in carotene, vitamin A, potassium and iron (Udofia and Nlebem 2013). Ekwueme, Mba and Onoh (2018) explained that plantain is consumed by about 70 million people in different part of the world in different ways. The authors noted that it may be eaten ripped, unripped or prepare into different recipes.

According to Okongwu (2011) Plantain has more than 60 varieties. The author grouped this varieties into four, thus; giant French, medium type, small and dwarf type. Ugwuede (2022), stated that plantain species are classified into bunch types, floral types, based on their charactetics. The bunch type was classified into French plantain and French horn plantain. There is also a false horn plantain which is usually grown in Enugu state, because according to Kainga and Seiyabo (2012) the specie produce heavier bunches and much fruit and stores more than other. Maturity of plantain occurs between 3-4 months after flowering or 9-12 months after establishment. Plantain is a perishable crop which deteriorates very fast especially when ripped hence do not store for so long.

Ogbazi in Ugwuede (2022), noted that at post-harvest, plantain need to be handled carefully and put in a consumptive way very fast to avoid wastage and deterioration leading to ripening senescence and ultimate death. According to Ugwuede (2022), mechanical damage may occur during harvesting, hauling, handling and transportation such as piling bunches on top of each other during loading and unloading, causing considerable bruising and breaking of the fingers. Such damages as from loading and unloading need to be carefully carried out to avoid bruises, cuts, breaks, deformation and invisible wound which according to Iwena (2015), might introduce fungal attack.

Food or crops which easily deteriorate need to be processed into the form that the loss of its quality and vitality would be reduced or avoided. According to Olojede and Odoemelam (2018) loss of quality and quantity of food are mainly avoided by processing and packaging into forms they can be easily handled.

Processing was defined by Hornby (2016) as to put a raw material or food through an industrial or manufacturing process in order to change it. In the view of Felix (2019), processing is the transformation of material, food which may include plantain into various forms that increase and improve their shelf life. Ugwuede (2022) stated that plantain is transformed into goods ready to be used or sold and ease of handling. This study view processing as changing or transforming plantain into various forms for consumption, to improve palatability, usefulness and to make it easy for transportation. To be able to process plantain effectively, the individual must possess the needed skills.

Skill is defined by Okorie in Aneke (2014) as a well-established habit of doing something and it involves the acquisition of performance capability. Hank in Aneke (2016) explained skill as ability that comes from knowledge, practice and attitude to be able to do something well. These skills could be exposed to the recipients through the teachers of agricultural science who according to Olaitan, Asogwa and Umeh (2010) are charged with the responsibilities of imparting acquired knowledge and skills during training to the students in secondary school. Encarta (2015) defined a teacher as somebody who teaches especially as a professional. A teacher of agriculture is a professional in the field of teaching farming activities. In most cases agricultural science teachers based most of the teaching in theories more than practical, which now made it very imperative that the students still need the attention of the local plantain processors for basic knowledge in plantain processing even when they have graduated.

To achieve this, there are various skills needed in handling and processing plantain in order to grantee the quality, standard and nutritional value required for both local and international consumption. The processes involved could be grouped into four, thus: processing of plantain into dodo (Ikire), processing of plantain into flour, processing of plantain into pudding. If these graduates who roam about the street are exposed to plantain processing skills while still in the school, they will be able to establish small and medium enterprise in plantain processing thereby being self-reliance or employer of labour.

Self-reliance according to Hornby (2016) is the ability to take decision by oneself rather than depend on other people for help. A self-reliant individual trust his power, abilities, resources rather than those of others. The individual gains a quality of being autonomous and independent, in other words they care for themselves. www.vocabulary.Com/dic tionary. Most school graduates especially agricultural

graduates who have many job opportunities in their area of study roam about the streets causing havoc because they do not possess the needed skills that might make them useful and self-employed. If these graduates who have spent six years in secondary school after basic levels are exposed to plantain processing skills, they will be self-employed and contribute in the growth of the economy of the nation, hence the need for this study, plantain processing skills needed by secondary school graduates for self-reliance in Enugu State.

Statement of the problem

The main trust of agricultural education at secondary school level is to expose the students to acquire relevant farming skills that will equip and make them to fit-in in the world of works. The situation is that teachers do not emphasis field experience in processing of agricultural produce for availability of food where these students could acquire the needed skills. This has lead to secondary school graduates of agriculture roaming the street and engaging in different vice attitude. If these students are not exposed to acquire practical skills, they would graduate from secondary school without skills and be dependent on parents. There is therefore need to expose the students to practical plantain processing skills while still in school.

Purpose of the study

The main purpose of this study was to determine the plantain processing skills needed by secondary school graduates for self-reliance in Enugu State.

Specifically, the study sought to determine the:

1. Skills needed by secondary school graduates for processing of plantain into dodo (Ikire) for self-reliance in Enugu State.
2. Skills needed by secondary school graduates for processing of plantain into flour for self-reliance in Enugu State.
3. Skills needed by secondary school graduates for processing of plantain into chips for self-reliance in Enugu State.
4. Skills needed by secondary school graduates for processing of plantain into pudding for self-reliance in Enugu State.

Research Questions

The following research questions guided the study.

1. What are the skills needed by secondary school graduates for processing of plantain into dodo (Ikire) for self-reliance in Enugu State?
2. What are the skills needed by secondary school graduates for processing of plantain into flour for self-reliance in Enugu State?
3. What are the skills needed by secondary school graduates for processing of plantain into chips for self-reliance in Enugu State?
4. What are the skills needed by secondary school graduates for processing of plantain into pudding for self-reliance in Enugu State.

Research Method

The study adopted a survey research design and was deliminated to Enugu State – Nigeria. The population of the study was 279, made up of 253 teachers of agriculture and 26 local plantain processing in Enugu state. Sample random sampling techniques was adopted to sample 86 agricultural science teachers. The entire local plantain processors were used. This gave a total respondents of 112. A structured questionnaire was used as instrument for data collection. The questionnaire contained 27 items with a four point rating scale of Very Highly Needed (VHN), Highly Needed (HN), Moderately Needed (MN) and Not Needed (NN) with norminal value of 4, 3, 2 and 1 respectively. The questionnaire was validated by three experts. Two from Department of Vocational and Technology Education

(Agricultural option) and one from Department of Mathematics and Computer Education, all from Enugu State University of Science and Technology (ESUT). A total of 112 copies of the questionnaire were administered to the respondents by the researcher with the help of two research assistants who were properly briefed on the content of the questionnaire and it administration. Out of 112 copies of the questionnaire distributed, 105 copies were properly filled and used for the study and it represented 90.82% return rate.

Mean and standard deviation were used to answer the research questions. Corresponding mean score was interpreted using real limit of numbers thus any item statement with mean score of 3.50 to 4.00 was regarded as very highly needed, 2.50 to 3.49 was regarded as highly needed, 1.50 - 2.49 was regarded as moderately needed while 0.50 – 1.49 was regarded as not needed.

Result

Research Question 1

1. What are the skills needed by secondary school graduates for processing of plantain into Dodo (Ikire) for self-reliance in Enugu state?

Table I: Mean scores of respondents (Teachers and local plantain processors) on skills needed by secondary school graduates for processing plantain into dodo (Ikire) for self-reliance in Enugu State.

S/N	Skills needed for processing of plantain into Dodo (Ikire)	Teachers N=79		Local processors N = 26		Overall	Decision	
		$\overline{x_1}$	SD_1	$\overline{x_2}$	SD_2	$\bar{X}G$	SDG	Decision
1.	Separate the bunch into individual fingers	3.01	0.63	3.10	0.60	30.40	0.62	HR
2.	Peel each finger with knife to obtain pulp	3.01	0.62	3.09	0.59	3.03	0.61	HR
3.	Put the pulp in a mortal and mash with pestle	3.01	0.63	3.10	0.60	3.04	0.62	HR
4.	Mix partially grinded pepper with the mashed pulp	3.03	0.61	3.16	0.52	3.08	0.58	HR
5.	Cut paste into slurry and fry in oil	3.04	0.60	3.16	0.52	3.08	0.58	HR
6.	Remove fried paste into a sieve to drain	3.80	0.56	3.19	0.48	3.11	0.54	HR

In Table I above, items 1,2,3,4,5 and 6 had mean scores of 3.04, 3.03, 3.04, 3.08, 3.08 and 3.11 respectively indicating that the respondents identify the items as highly needed skills for processing of plantain into dodo for self-reliance, also the standard deviation ranged from 0.54-0.62, this shows that the respondents are homogeneous in their responses.

Research Question 2

What are the skills needed by secondary school graduates for processing of plantain into flour for self-reliance in Enugu State?

Table 2: Mean ratings of the respondents (Teachers and local plantain processors) on the skills needed by secondary school graduates for processing of plantain into flour for self-reliance in Enugu State.

S/N	Skills needed for processing of plantain into flour	Teachers N = 79		Local Processors No= 26		Overall	Decision	
		$\overline{x_1}$	SD_1	$\overline{x_2}$	SD_2	$\bar{X}G$	SDG	
7.	Separate the bunch into individual fingers	3.08	0.56	3.19	0.48	3.11	0.54	HR
8.	Wash the fingers	3.08	0.56	3.19	0.48	3.11	0.54	HR
9.	Peel with a knife	3.03	0.60	3.16	0.53	3.09	0.58	HR
10.	Slice into desired sizes	3.04	0.52	3.10	0.61	3.06	0.60	HR
11.	Dehydrate the slice in a cabinet dryer or sundry for some days	3.08	0.56	3.19	0.47	3.11	0.54	HR

The analysis of data presented in Table 2 above shows mean rating ranging from 3.06 to 3.11 showing highly required. This means that the respondent agreed to the statements as the skills needed for processing plantain into flour. The standard deviation of the respondents ranged from 0.54-0.60 are close. This shows that the respondents were not far from the mean and were close to one another in their opinion, that the secondary school graduates need the processing skill.

Research Question 3

What are the skills needed by secondary school graduates for processing plantain into chips for self-reliance in Enugu State?

Table 3: Mean rating of the respondents (Teachers and local plantain processors) on the skills needed by secondary school graduates for processing of plantain into chips for self-reliance in Enugu State.

S/N	Skills needed for processing of plantain into chips	Teachers N = 79		Local Processors No= 26		Overall	Decision	
		$\overline{x_1}$	SD_1	$\overline{x_2}$	SD_2	$\bar{X}G$	SDG	Decision
12.	Identify mature unripe plantain bunch	3.07	0.58	3.13	0.62	3.08	0.59	HR
13.	Separate the bunch into individual fingers	3.09	0.57	3.12	0.61	3.10	0.58	HR
14.	Wash the fingers and peel with knife	3.17	0.58	3.13	0.62	3.11	0.59	HR
15.	Slice to shape with knife or plantain slicer	3.07	0.62	3.10	0.65	3.08	0.63	HR

16.	Mix the sliced with salt	3.05	0.63	3.06	0.68	3.06	0.64	HR
17.	Put the sliced into a frying pot containing oil and heat to about 2 to 3 minutes	3.03	0.64	3.13	0.56	3.05	0.61	HR
18.	Grade the chips according to sizes	3.00	0.66	3.06	0.63	3.02	0.65	HR

The data presented in Table 3 above showed that the mean rating of the respondents in all the seven items ranged between 3.02 to 3.11. This result indicate that all the seven items are highly needed by secondary school graduates for processing of plantain into chips.

The items had their standard deviation ranged from 0.58-0.65, which indicated that the respondents were not far from the mean and were close to each other opinion.

Research Question 4

What are the skills needed by secondary school graduates for processing of plantain into pudding for self-reliance in Enugu State.

Table 4: Mean scores of the respondents (Teachers and local plantain processors) on skills needed by secondary school graduates for processing of plantain into pudding for self-reliance in Enugu State.

S/N	Skills needed for processing of plantain into pudding	Teachers N = 79		Local Processors No= 26		Overall	Decision	
		$\overline{x_1}$	SD_1	$\overline{x_2}$	SD_2	$\bar{X}$ G	SDG	
19.	Peel both plantain with knife	3.04	0.62	3.10	0.60	3.06	0.61	HR
20.	Wash the pulp	3.00	0.66	3.06	0.63	3.02	0.65	HR
21.	Slice the pulp into sheet with knife	3.00	0.65	3.06	0.62	3.02	0.65	HR
22.	Sundry the slice pulp for 3-5 days or use a force air moisture extraction oven or sanyo galenkamp at 65^{o}C for about 48 hours	3.05	0.63	3.16	0.58	3.08	0.62	HR
23.	Mill the unripe and ripe slice separately	3.05	0.63	3.16	0.58	3.09	0.61	HR
24.	Mix water to the milled slice to form slurry	3.01	0.67	3.13	0.62	3.05	0.65	HR

25.	Mix the ripe slurry with the unripe slurry	3.09	0.66	3.19	0.60	3.12	0.64	HR
26.	Mix two cooking spoon of palm oil and with other ingredients and stir vigorously	3.11	0.63	3.19	0.60	3.13	0.62	HR

The data presented in Table 4 above reveals that items 20, 21, 22, 23, 24, 25, 26 and 27 had their means score ranging from 3.02 – 3.13. These scores falls within the range of highly needed. This shows that the statement in the items are skills needed by secondary school graduates for processing of plantain into pudding for self-reliance in Enugu State. The items had their standard deviation ranged from 0.61-0.65. This indicated that the respondents were not far from the mean and were close to one another in their opinion.

Discussion of Findings

The findings according to research question I table I depicted the skills needed by secondary school graduates for processing of plantain into dodo (Ikire) for self-reliance in Enugu State. The identified skills were; separate the bunch into individual fingers, peel each finger with knife to obtain pulp, put the pulp in a mortar and mash with pestle, mix partially grinded pepper with the mashed pulp, cut paste into slurry and fry in oil and remove fried paste into a sieve to drain. This was in line with Felix (2019) who noted that perishable fruits such as pineapple, banana need to be processed into other valuable products to avert spoilage.

The findings in research question 2, table 2 revealed the skills needed by secondary school graduates for processing of plantain into flour. The skills identified include separate the bunch into individual fingers, wash the fingers, peel with knife, slice into desired sizes among others. This was in line with Iwena (2015) who is of the view that processed products such as yam flour have better storage and can be utilized in different forms.

The findings of the study in Table 3 showed the skills needed by secondary school graduates for processing of plantain into chips. The findings include ability to identify mature unripe plantain bunch, separate the bunch into individual fingers, wash the fingers and peel with knife, slice to shape with knife or plantain slicer, mix the slice with salt, put the sliced into a frying pot containing oil and heat to about 2 to 3 minutes and grade the chips according sizes. Felix (2019 highlighted that slicing product to be process into other forms such as yam into flour, cocoyam into flour, plantain into chips enhances dryness.

Furthermore, the findings on research question 4 table 4 which is processing plantain into pudding has the skills involved as peel both plantain with knife, wash the pulp, slice the pulp into sheet with knife, sundry the slice pulp for 3 – 5 days or use a force air moisture extraction oven or sango galenkamp at 65^{o}C for about 48 hours among others.

Conclusion/Recommendation

Based on the findings of this study, it was concluded that, secondary school agricultural science graduates need to be exposed to skills in processing plantain. These skills will enable them to remain self-reliant on graduation. It is therefore

recommended that the identified skills in plantain processing be taught to student and also encourage them to align with local processors for effectiveness to meet up with the standard required in the business world of today.

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