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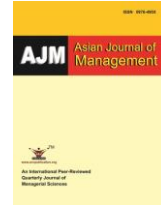
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RESEARCH ARTICLE

Production of *Makuea poo-ung* puree for usage in meal preparation

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ABSTRACT:

Makuea poo-ung is a perishable vegetable which can only be transformed to prolong the usability and also get access to it during the lean season. The processing of perishable products prevents conspicuous change in the content of nutrients and sensory properties. The main objective of the study is to use an untried technique to process *Makuea poo-ung* into a convenience food item. An experimental research was used to assess a suitable method of producing *makuea poo-ung* puree for domestic and commercial use. Results revealed that the use of ascorbic acid and lemon juice for the inhibition of enzymatic browning experienced slight uniform discoloration when it was boiled so colour turned to jade green. In conclusion puree can be portioned into cubes and stored in the freezer up to six months. It is recommended that home makers should adopt the recipe for domestic production of puree for convenience use and also for easy access during the lean season.

KEYWORDS: Ascorbic acid, Enzymatic browning, Lemon juice, *Makuea poo-ung*, Puree.

1. INTRODUCTION:

Makuea poo-ung is a type of eggplant which is also called aubergine and brinjal owing to the common names given to all members of the eggplant family due to their close relation utility [1]. *Makuea poo-ung* locally called cherry eggplant, belongs to the botanical variety of *Solanum melongena* var. *depressum* Linnaeus which is part of the third group of eggplants that are basically small, miniature and dwarf [2]. It originated from Southern India, where it was found wild in the forest of India. Far along, cultivation sprung up in Pakistan and then during the 4th and 5th century, cultivation commenced in China [1]. In later years, China became the world's lead producer of *makuea poo-ung* followed by India, Iran,[3].

In Africa, discovery of *makuea poo-ung* was made more popular around the 9th century during prehistoric times. It was described as semi-domesticated species because they were gathered mostly in farmlands and at various backyard gardens [4,5]. In Ghana, cultivation of *makuea poo-ung* was unplanned. Relatively, they grew on their own even in people's home. Additionally, *makuea poo-ung* is so cheap in Ghana that some traders voluntarily give it out to customers for free when they buy other foodstuffs from them [5,6]. Also, some unique characteristics of *makuea poo-ung* is that, they are highly nutritious, highly perishable, bitter, discolours rapidly, consumes time in its preparation for food and very cheap.

Production into convenience foods fundamentally conserves time and energy needed for food production [7-9]. Eggplants can be transformed to prolong their usability when processed. In the quest to achieve good results, the ideal time for processing perishable

products like *makuea poo-ung* should be within seven to ten hours after harvesting. This is to prevent conspicuous changes in the nutrients, sugar present, colour of fruit, texture and flavour [8,10]. It is a stage where the environment for destructive micro-organism have not yet been created for reproduction. [7-9,11]. More so, processing vegetables ensure their availability during the lean season.

Food preservation offers perishable products a longer life span and production of new manufactured product [12]. Processing of fruits can be done by converting them to purees, juices, canned fruits, dried fruits, pickles and preserves [10,13].

Processing food into puree is the alteration of the properties of solid food made into thick smooth consistency paste for easy usage [14,15]. Pureeing is described as the transformation of solid vegetables to an extremely thick liquid, or spoon-thick consistency [15,16]. This is basically processed by boiling/baking of vegetables and then blending of product using a liquidizer or a food processor [15-17]. In addition, pureed eggplant ought to be kept in the freezer all the time and should only be removed when ready to cook with it.

Fundamentally, it is assumed that the production of eggplant into puree constitute a genuine modification for utilizing loss of vegetable left-over especially during their peak season [17]. The temperature and duration selected for the production of eggplant puree depends on the type of eggplant and maturity. Also, quality is affected when more pressure is applied on eggplant, whilst cost and increase in energy is also affected when lower pressure is used [11,18]. Heat applied to eggplant uniformly discolours the vegetable. At places where there is no electricity eggplant puree cannot be stored.

Makuea poo-ung is inexpensive, easily accessible but has a natural limited shelf life which continues to attract food loss due to the high perishability rate [13,19-21]. Curbing enzymatic browning by the use of red onions or lemon to prolong the lifespan, can only be sustained for barely two weeks of storage after which discolouration is inevitable [19,20]. Homemakers who are also working mothers encounter constraints of time executing their day to day activities. As a result, preparing *makuea poo-ung* for daily food preparation is so cumbersome that, most people deter from using it [13,22]. Similarly, others who wish to add *makuea poo-ung* to their meals do so only when they have enough time available. More so, methods used in cooking *makuea poo-ung* affects the nutrients present in that the

stalk is mostly thrown away [22]. The challenge is, what can be done to minimize wastage of fresh *makuea poo-ung* during food preparation? What measures can be put in place to make *makuea poo-ung* readily available for use by homemakers all the time and especially during lean season? In the light of this, the researcher aims to explore some mechanisms that can be used to safeguard the continuous loss of *makuea poo-ung* and also transform it into convenience food items for instant usage.

The main objective of the study is to use an untried method/technique to process *makuea poo-ung* into convenience food, then also devise a simple procedure for homemakers to domestically prepare *makuea poo-ung* powder and puree for use during daily meal preparation.

2. METHOD/TECHNIQUE:

The production of *makuea poo-ung* puree was accomplished at the Mycotoxin and Food Analysis Laboratory, Department of Food Science and Technology, Faculty of Biosciences, College of Science. At the laboratory, food grade (edible) ascorbic acid (0.1%) was used to inhibit discolouration. Although vitamin C is sensitive to heat and light, [23] it is reported that between 69% to 90% of ascorbic acid is retained when samples are heated at high temperature within a short time. Further it is confirmed that ascorbic acid treatments improve the colour of vegetables prone to discolouration and also adds nutritional value [24]. In this context, about 69 to 90% vitamin C (ascorbic acid) is the additional nutrient present in every 500g *makuea poo-ung* puree. In addition to this, the researcher made use of knowledge acquired to prepare domestic *makuea poo-ung* puree. Domestically, lemon juice (50ml) which is an antioxidant curbed enzymatic browning. It contains calories (14.5), water (44.5ml), protein (0.55g), carbohydrate (4.5g), sugar (1.25g), fibre (1.4g), fat (0.15g), vitamin C (44ml), iron (1.5g), Vitamin B6 (2.5ml) and calcium (1g) which served as an added nutrient suitable for humankind [25]. The use of ascorbic acid and lemon juice are healthy food items that also provide added nutrients to *makuea poo-ung*.

Apparatus/tools used for production of *makuea poo-ung* puree:

Plastic bowls, Weighing scale,
Strainer, Stainless steel saucepan,
Source of heat, Commercial blender,
Ice cube trays,
Deep freezer,
Zip locks/air tight containers

Materials:

Ascorbic acid	0.1%
Makuea poo-ung	500g
Water	500ml

Method:

- Sort, wash, strain and weigh *makuea poo-ung* into a bowl.
- Pour 0.1% ascorbic acid and 500ml of water unto a stainless-steel saucepan.
- Boil vegetables at 100°C for 8-10 minutes and allow to cool down a bit.
- Blend it warm till it is smooth.
- Pour into ice cube trays and chill in the freezer
- Once it is frozen, pop out cubed *makuea poo-ung* and package in polyethene bags.
- Return unto the freezer and pick the quantity needed anytime you are cooking.

Note: Ascorbic acid can be replaced with 50ml lemon juice for domestic puree making.

Production of *makuea poo-ung* puree



Fig. 1. Ascorbic acid added to *Makuea poo-ung* to inhibit discolouration



Fig.2. *Makuea poo-ung* boiled in lemon for 8-10 minutes and blended whilst warm

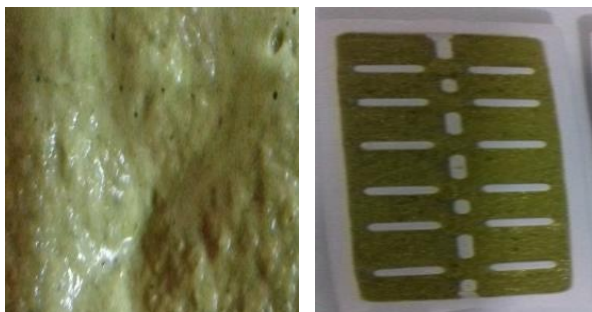


Fig.3. Blended *Makuea poo-ung* put in ice cube trays



Fig.4 Cubed *Makuea poo-ung* puree packaged in zip lock and plastic container

3. RESULTS:

Ascorbic acid and lemon juice provided additional nutrients to *makuea poo-ung* puree when greater quantity of Vitamin C was added to the boiling water. This antioxidant slowed down the damage of discolouration. The sample of *makuea poo-ung* puree had a slight uniform discolouration after it was boiled. Milling into puree had no further change in colour even up to the cubed stage. Cubed puree can only be stored in the deep freezer.

4. DISCUSSION:

Four authors [16-19] proposed that, boiling of *makuea* puree needs about ten minutes to get softened fruit amidst slight discolouration. This was evidently confirmed during the cooking period utilized. Also, the sample had a uniformly slight discolouration leading to a pleasant jade green colour. Sample blended whilst warm attained a smooth consistency. This was likewise established by the same [16-19] who also affirmed that blending of warm product yield good results than when it is cold. *Makuea poo-ung* puree has to be packaged in ice cubed cases for portioning purposes or in small containers for easy usage, then kept frozen all the time in order to maintain the jade green colour.

5. CONCLUSIONS:

In the preparation of puree, as ascorbic acid was used at the Mycotoxin and Analysis Science Laboratory, lemon juice was used at home to boil *makuea poo-ung*. The slight discolouration attained by *makuea poo-ung* puree was still pleasant. *Makuea poo-ung* puree can be used at all times in the preparation of several dishes.

Specific contribution to literature:

Specific procedure for processing pureed *makuea poo-ung* can be prepared domestically by homemakers and stored for daily usage. It has no addition of food additives and it is to supplement basic nutritional intake for healthy living among expectant mothers and the entire family.

6. APPRECIATION:

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