

## Production of weaning food using Sweet Potato (*Ipomea batata*) and Soyabeans (*Glycine max*)

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### ABSTRACT

The study was carried out on the production of weaning food using Sweet Potato (*Ipomea batata*) and Soyabeans (*Glycine max*). The Soyabeans was steeped in water for 30 minutes and boiled for 2hrs, dehulled and dried under the sun for 3 days, toasted, milled and sieved to finesse. The Sweet Potato was washed, peeled, blanched and dried with cabinet drier at a temperature of 100<sup>0</sup>C for 5hrs, milled and sieves to finsesse. The Sweet Potato and Soyabeans flour were mixed and composited in various ratio, 50:50, 60:40, 70:30, 80:20. Sensory evaluation was carried out using untrained panels to ascertain the best among the product in terms of flavor, taste, texture and general acceptability. The sample with the ratio of 70:30 Sweet Potato flour to Soyabeans flour (SPF: SBF) was ranked highest by the judges which showed that it was well accepted by them. This sample was then compared with a standard (Nutriend). The fat content of the blend was 14.5% by using soxhelet method and the moisture content was 5.0%.

**Keywords:** *Ipomea batata*, *Glycine max*, *Akamu*, *Minerals*

### INTRODUCTION

Weaning food is the food used gradually to stop feeding a baby with the mothers breast milk and start feeding him or her with solid food like blended soyabeans and sweet potato flour but weaning its self is the process of introducing your baby to solids or semi solids after being totally dependent on breast milk for her nutritional need for the first six months of life (Oxford Advanced Learner Dictionary, 2008). Weaning starts at different time in different communities and its effect on infants of different socio-economic group also vary. Infant of more influents socio-economic groups in industrialized and developing countries, in absence of breast feeding super no nutritional disadvantage when feel properly constitute and hygienically prepared processed commercial food. (Morely, 1998).

However, the early abandonment of breast feeding by mothers among lower socio-economic group has often proved to be disastrous to infants. This is as a result of inadequate financial resources to purchase sufficient formula, lack of knowledge and facilities to follow hygiene practices necessary to feed infants with breast milk replacement (Morely, 1998).

Soyabeans is highly rich in food values, which varies widely in their appearance and composition. The main constituents of soyabeans in descending order are protein complex carbohydrates, oligosaccharides, simple sugar, minerals and vitamins (Roberts, 1977) many legumes contains 20-25% protein, but soyabeans typically contain 30 – 45% protein (moisture free basis) and average 35.5 to at 13% moisture levels as high as 50% moisture levels as high as 50% protein (moisture free basis) have been observed (Hurbough *et al*, 1990). The crude oil extracted from soyabeans contains about 95% triglycerides. The fatty acid composition of the triglycerides is approximately 11% palmitic (C<sub>16</sub>) 45 stearic (C<sub>18</sub>), 25% Oleic (C<sub>18:1</sub>), 5% linoleic (8:2) and 8% Linoleic (C<sub>18:3</sub>) with other minor fatty acids also present (Erickson, 2003). Soya flour is approximately 80% digestable, where as toasted and

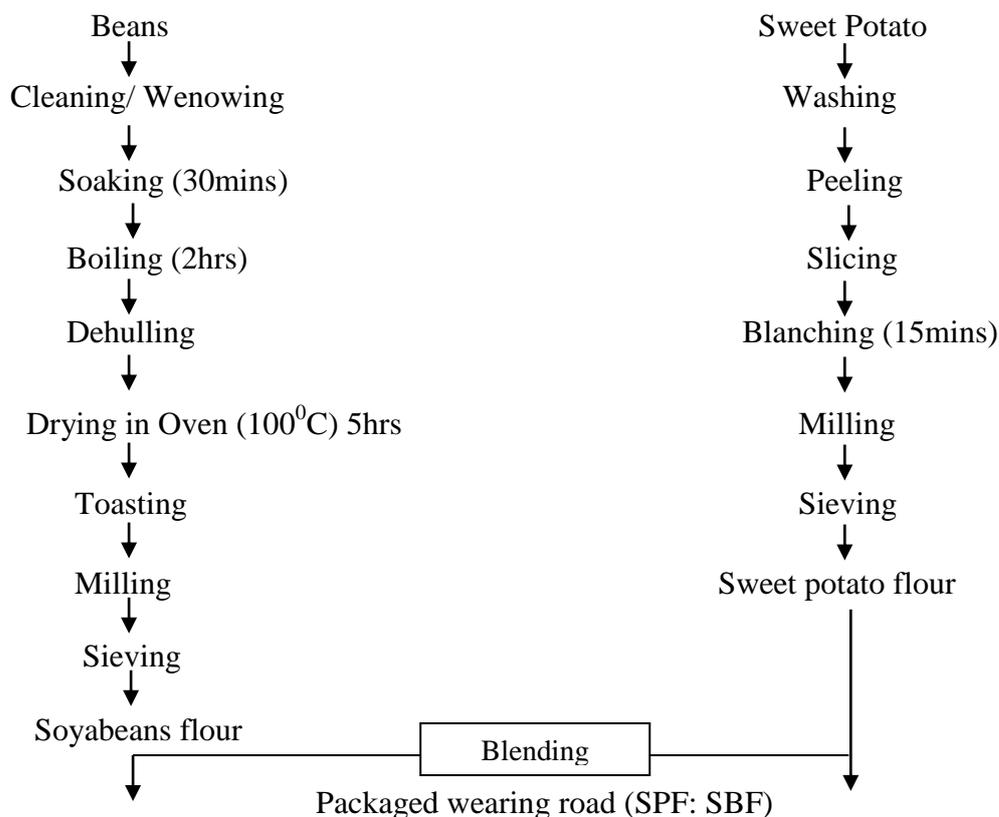
steamed while soyabeans are only 65% digestable, apparently because of lack of processing. (Erdman and Fordyee 1990).

Sweet Potato (*Ipomea batata*) in common with other root crop is highly rich in carbohydrate (main energy source). It provides high energy value of 441kg (king 1991). It is a good source of vitamin A, vitamin B, and vitamin c. it is also a good source of carotene (Vitamin A precursor) Nzelu, 2007). Sweet potato may be peeled, sliced, washed, salted and deep fried in hot oil, and eaten with or without any sauce. Fried potatoes are usually eaten as breakfast (in many families) in combination with maize gruel e.g. “Akamu” custard (Nzelu, 2007).

The aims and objective of this work is to sensitized mothers on the need to use natural existing food like soyabeans and sweet potato to wean children by so doing leads to saving of resources that could have been wasted in buying already canned products that are costly and not at the reach of common persons.

### MATERIALS AND METHODS

The Soyabeans (*Glycine max*) and Sweet Potato (*Ipomea batata*) were purchased from Eke Awka main market Anambra State, Nigeria. The weighing balance, oven, stove, frying pan sieves, kenwood blender, knife, kettle, thermometer, bowels, spoons, water were obtained from food processing laboratory, of food technology Department, Federal Polytechnic Oko, Anambra state, Nigeria.



**Fig. 1: Flow Chart for the production of weaning food using Sweet Potato and Soyabeans**

800g of Sweet Potato were washed and peeled and was sliced to about 0.5mm thick after which it was blanched in boiled water (100°C) for 15mins. It was then dried in cabinet direr (100°C) for 5hrs to reduce the moisture content, then it was milled to pass over 0.25mm

sieve. The powder was collected and was labeled Sweet Potato flour (SPF) and was stored in a cool dry place.

### **Preparation of Soyabeans Flour**

Wholesome Soyabeans were sorted of which 800g was weighed, washed, soaked (30mins) boiled for 2hrs and was dehulled, dried and roasted until the colour change to golden brown and was taking to the milling machine after which it was milled to pass over a 0.25mm sieve. Then the powder was collected and labeled Soyabeans flour (SBF) and was kept in a cool dry place.

### **Mixing**

The Soyabena flour (SBF) was blended with Sweet Potato flour (SPF) on a replacement basis in a kenwood blender in different composite mass ratio 20:80, 30:70, 40:60 and 50:50 of SBF: SPF and a constituent flour blend were obtained (Fig. 1).

### **Constitution of the Blend**

The mixes was poured in a bowel of boiled water (60<sup>0</sup>C) and was well stirred for 2mins, the reconstituted blend were then evaluated with a reference infant food (Nutriend) for sensory character/evaluation (Ngoddy *et al.*1985).

## **RESULTS AND DISCUSSION**

### **Questionnaire for Sensory Evaluation of the product weaning food**

9 hedonic scales are to be used to evaluate the sensory evaluation on taste, texture aroma and general acceptability.

: The graduated scale used is as shown below:

Like extremely	- - - - -	9
Like very much	- - - - -	8
Like moderately	- - - - -	7
Like slightly	- - - - -	6
Neither lie nor dislike	- - - - -	5
Dislike slightly	- - - - -	4
Dislike moderately	- - - - -	3
Dislike very much	- - - - -	2
Dislike extremely	- - - - -	1

### **Moisture content Determination**

The hot air oven method (Pearson, 1976) was used in the determination. The petri dish was thoroughly washed and the dried in oven at 100<sup>0</sup>C for 30mins and then weighed 5g of the sample was introduced into the dish and was placed inside the oven at 105<sup>0</sup>C – 107<sup>0</sup>C for 3hrs after which the dish containing the sample was removed and the weight of the dish and dried content were determined.

### **Fat Content Determination**

The fat content of the sample was determined by soxhlet extraction method. The flat bottom flask was dried and weighed. 5g of the sample was weighed out and poured in a paper

thimble and covered with cotton wool, the thimble was introduced inside the extractors 150ml of petroleum ether was measured and poured into flat bottom flask and covered with condenser. The extractor was set up and switched on. (heated the flask until the solvent start to boil). The refluxing was timed for 2hrs. The flask was dried in oven at 105<sup>0</sup>C – 107<sup>0</sup>C for 3hrs, the flask was covered with cotton wool and allowed to cool. The flask was weighed again and the different in weight of the flask was the weight of the fat content.

The fat content was calculated

$$\% \text{ Fat} = \frac{\text{Increase in weight of flask}}{\text{Weight of sample}} \times 100$$

**Table 1**  
**Results of Sensory Evaluation**

Average composition	SBF:SPF 20:80	SBF: SPF 30:70	SBF:SPF 40:60	Nutriend (connected)
Taste	6.0	8.3	6.1	7.7
Flavour	6.8	7.6	7.0	6.7
Texture	6.0	7.6	6.7	7.9
Overall acceptability	6.8	8.4	7.0	6.7

From the evaluation of the sensory characteristics of the blend as regard to the taste, aroma, texture and general acceptability, the mixture ratio of 30:70 Soyabeans flour (SBF) to sweet potato flour (SPF) in comparison with the reference infant food (Nutriend) gave the highest acceptability. The Aroma of the blend was not the same with that of commercial baby food because there was no artificial flavor rather it was natural.

The texture of the blend was smoother than the commercially sold ones but from result, the texture of commercial sold one was more acceptable than as for the taste and acceptability, there was to significant difference (Table 1).

### **Moisture content and fat Content**

The fat content was 14.5% while the moisture content was 5%. The moisture content was determined using hot air oven and the result got was 55 and was comparable to result of safety moisture content stated by Pearson, 1976. The fat content was determined by Soxhlet extraction method and result got 14.5% was comparable with (Hurbiough *et al.*, 1990) which state that the fat content ranges form 15-24.5%.

From the sensory evaluation carried, the 70:30 Sweet Potato flour (SPF) to Soyabeans flour (SBF) gave the highest acceptability among all other composited rations of the blend. Since Soyabean is high in sulphur containing amino acid but low in lysine, sweet potato is low in sulphur containing amino acid but high in lysine (Ngoddy *et al.*, 1985), the protein of Soyabeans would complement the sweet potato protein and improve the nutritional quality of the blends, the caloric value then increases in Soyabeans flour because of the high oil content than sweet potato.

### **CONCLUSION**

From the result of this study, it was revealed that Soyabenas Flour (SBF) an Sweet Potato Flour (SPF) can be composited in different ratio but the ratio of 70:30 Sweet Potato

Flour (SPF) and Soyabeans Flour (SBF) gave the highest value in terms of acceptability and taste, mothers should wean their children with local (natural) made infant food like blended SPF and SBF since they are cheap and easy to prepare and has the entire nutrient required for the infant growth.

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