

## Quality Evaluation of Ebiripo using Cocoyam/Soybean/Soyresidue Blends

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### Abstract

An attempt was made to evaluate the nutritional status of ebiripo using cocoyam/soyflour/soyresidue blends. Ebiripo fortified with 40% soyflour was significantly higher in protein (28%) and fat (8.4%) than the other ebiripo samples. Unfortified ebiripo was the highest in ash (7.23%) and total carbohydrate (28.77%). Ebiripo fortified with 10% soyflour was significantly higher in K (1.53%) and Ca (0.62%).

Generally, unfortified ebiripo was higher in general acceptability and ebiripo fortified with soyflour was better accepted than ebiripo fortified with soyresidue.

**Keywords:** Ebiripo, Fortified, soyflour, soyresidue.

### Introduction

In developing countries like Nigeria, the consumption of starch based foods from tubers and cereals is very common amongst the people. Ebiripo is a local dish of the Ijebu tribe in South Western Nigeria. It is popular among the young and old in this area. It is made by grating cocoyam and mixing with water to form a paste. Salt is also added for taste. It is then wrapped in leaves and allowed to steam until it is ready for consumption. Ebiripo is usually eaten with palm oil or any type of soup.

Cocoyam is very poor in protein but high in carbohydrate and cocoyam has been implicated in fortification process. (Lesile, 1967 Onwueme, 1978 Oyenuga, 1968 and Ogunyanwo, 1982).

Soybean, common and readily affordable is rich in protein, oil and essential nutrients (Omueti *et al.* 1994, Oyenuga 1968 and Rackis *et al.* 1961 and Weingartner 1989). The high protein content of soybean can be used to reduce the problem of malnutrition in Nigeria. (Omueti *et al.* 1994).

Ebiripo is solely made from cocoyam which is known to be poor in protein and other nutrients. This product can then be regarded as being poor nutritionally. Therefore there is need to

improve the nutritional status of the food by way of fortification.

The combination of cocoyam and soybean in the processing of ebiripo will bring about a nutrient complementability. Thus the objective of this research work is to evaluate the chemical and consumer preference of Ebiripo fortified with soybean flour and residue.

### Materials and Methods

#### Raw materials

Soybean and cocoyam were purchased from Apata, a local market in the city of Ibadan, and Ebiripo processing was done at crop utilization unit of the Institute of Agricultural Research and Training Moor Plantation, Ibadan.

#### Processing of Ebiripo

Cocoyam tuber was peeled, washed and grated. Water was added to form a paste of soft consistency and salt was added to taste. The paste was then wrapped in leaves and steamed until cooked.

#### Preparation of soyflour and residue

Soybean flour was prepared by picking whole soybean grains boiled for about 25 mins, hand peeled to remove the peels

and sundried for 2 days, and ground into flour. Soyresidue was prepared by picking soybean grain, steeped for 6 hours, hand peeled, wet milled and sieved with cheesecloth to remove the milk. The soyresidue was also sundried and packed.

#### Preparation of soyflour and soyresidue ebiripo

Dry soyflour and residue were added to cocoyam paste independently at 10%, 20%, and 40% levels and mixed with water to obtain a soft and smooth consistency. Salt was added for taste. They were wrapped in leaves and steamed for 45 minutes.

#### Chemical analysis

Chemical composition was done by A.O.A.C. (1990).

#### Sensory evaluation

Samples were given to panelists in tasting booths in such a way that there would not be any interference in their evaluation. Water was also provided for them to rinse their mouths. Ten panelists were used and analysis was on a nine-point hedonic scale basis (1 = extreme dislike and 9 = extreme likeness) (Larmond, 1937).

**Table 1.** Nutrient composition of ebiripo samples

	Crude protein (%)	Fat (%)	Moisture (%)	Ash (%)	Fe (%)	K (%)	Ca (%)	Total Carbohydrate (%)
Ebiripo	11.37 <sup>b</sup>	5.95 <sup>e</sup>	9.15 <sup>a</sup>	7.23 <sup>a</sup>	0.02 <sup>d</sup>	1.47 <sup>b</sup>	0.61 <sup>b</sup>	28.77 <sup>a</sup>
10% soyflour-ebiripo	16.64 <sup>c</sup>	7.01 <sup>c</sup>	7.03 <sup>b</sup>	5.82 <sup>d</sup>	0.03 <sup>c</sup>	1.53 <sup>a</sup>	0.62 <sup>a</sup>	19.66 <sup>b</sup>
20% soyflour-ebiripo	24.52 <sup>b</sup>	7.92 <sup>b</sup>	5.91 <sup>f</sup>	6.5 <sup>c</sup>	0.03 <sup>c</sup>	0.86 <sup>e</sup>	0.61 <sup>b</sup>	16.41 <sup>d</sup>
40% soyflour-ebiripo	28 <sup>a</sup>	8.4 <sup>a</sup>	5.57 <sup>b</sup>	7.11 <sup>b</sup>	0.03 <sup>c</sup>	1.21 <sup>d</sup>	0.55 <sup>d</sup>	13.98 <sup>b</sup>
10% soyresidue-ebiripo	14.01 <sup>f</sup>	5.64 <sup>b</sup>	6.50 <sup>c</sup>	3.62 <sup>f</sup>	0.032 <sup>b</sup>	1.31 <sup>c</sup>	0.50 <sup>e</sup>	16.65 <sup>c</sup>
20% soyresidue-ebiripo	14.88 <sup>e</sup>	5.80 <sup>f</sup>	6.35 <sup>d</sup>	3.53 <sup>b</sup>	0.04 <sup>a</sup>	0.72 <sup>f</sup>	0.61 <sup>b</sup>	15.57 <sup>c</sup>
40% soyresidue-ebiripo	15.74 <sup>d</sup>	5.97 <sup>d</sup>	6.26 <sup>e</sup>	3.98 <sup>e</sup>	0.04 <sup>a</sup>	0.27 <sup>b</sup>	0.56 <sup>c</sup>	14.55 <sup>f</sup>

Means in the same column followed by the same letter are not significantly different at  $p < 0.05$ .

**Table 2.** Sensory evaluation of ebiripo samples

	Colour	Taste	Texture	Flavour	General acceptability
Ebiripo	7.7 <sup>a</sup>	8.0 <sup>a</sup>	7.3 <sup>a</sup>	7.4 <sup>a</sup>	8.0 <sup>a</sup>
10% soyflour-ebiripo	6.6 <sup>ab</sup>	5.8 <sup>b</sup>	6.9 <sup>a</sup>	6.4 <sup>a</sup>	6.9 <sup>ab</sup>
20% soyflour-ebiripo	6.0 <sup>bc</sup>	5.2 <sup>bc</sup>	5.9 <sup>a</sup>	6.0 <sup>a</sup>	5.9 <sup>b</sup>
40% soyflour-ebiripo	5.1 <sup>bcd</sup>	3.7 <sup>cd</sup>	4.1 <sup>b</sup>	4.1 <sup>b</sup>	4.6 <sup>c</sup>
10% soyresidue-ebiripo	4.1 <sup>de</sup>	3.4 <sup>d</sup>	3.6 <sup>b</sup>	3.6 <sup>b</sup>	3.9 <sup>cd</sup>
20% soyresidue-ebiripo	4.6 <sup>cde</sup>	3.8 <sup>cd</sup>	3.4 <sup>b</sup>	3.6 <sup>b</sup>	3.2 <sup>d</sup>
40% soyresidue-ebiripo	3.2 <sup>e</sup>	2.7 <sup>d</sup>	3.7 <sup>b</sup>	3.0 <sup>b</sup>	3.6 <sup>cd</sup>

Means in the same column followed by the same letter are not significantly different at  $p < 0.05$ .

### Statistical Analysis

Data was subjected to analysis of variance and the means were separated by (Duncan 1955).

### Results and discussion

It was observed from **table 1** that 40% soyflour-ebiripo was significantly higher than the other samples in protein (28%) and fat (8.4%) at  $P < 0.05$ . These differences could be due to increased presence of soyflour in the ebiripo product.

Moisture (9.15%) and ash (7.23%) contents of ebiripo was significantly higher than other samples at  $p < 0.05$ . Cocoyam used in the preparation of ebiripo is known to be high in minerals. Also 10% soyflour-ebiripo was significantly different from other samples in K (1.53%) and Ca (0.62%). This indicates that 10% soyflour-ebiripo is rich

in K and Ca. Ebiripo fortified with soy residue at 20% was also significantly higher in Fe (0.04%) than other samples. The total carbohydrate of ebiripo was also significantly high (28.77%) as compared to other samples. Cocoyam used in the preparation of this product could be responsible for this, as it is high in carbohydrate (Oyenuga, 1968).

### Sensory evaluation of ebiripo samples

From **table 2**, it was observed that ebiripo was significantly higher in colour when compared with other samples. However, Ebiripo fortified with soyresidue at 40% level was scored very low. This could be due to increased presence of soy-residue in the product. Ebiripo was also significantly higher in taste as compared with other samples. With regard to texture and flavour,

ebiripo, 10% soyflour-ebiripo and 20% soyflour-ebiripo were not significantly different from each other at  $p < 0.05$ , but significantly higher than other samples.

With reference to general acceptability, it was observed that Ebiripo was significantly greater than other samples. Higher scores were also given at 10% soyflour-ebiripo and 20% soyflour-ebiripo. Ebiripo fortified with soyresidue at 10%, 20% and 40% levels attracted lower scores. The presence of soyresidue could be responsible for this result.

In conclusion, we found that Ebiripo and other soyflour-ebiripo samples were better accepted than soyresidue-ebiripo samples.

### References

AOAC 1990 Association of Official Analytical

Chemists. Official Method of Analysis. 13<sup>th</sup> edition Washington.

**Duncan D. B. 1955.** Multiple range and Multiple F tests. *Biometrics* 11(1). 1-5.

**Larmond 1937.** Laboratory method for sensory evaluation of food. Research Branch Canadian Dept. of Agric Publication Pp 50-59.

**Lesile K. A. 1967.** The significance of root crops in the tropics. Proceedings International Symposium on Tropical root crops Trinidad Vol. 2 Pp7

**Ogunyanwo O. A. 1982.** improving the nutrient quality of an Ijebu dish, Ebitipo and comparing with another Ijebu dish Ikokore. M. Sc. Thesis, Dept. of Human Nutrition U. I. (unpublished).

**Omueti O. and Ogundipe M. 1994.** Nutritional an acceptability characteristics of selected soybean supplemented and unsupplemented Nigeria local foods. *Tropical oil seed journal* Vol 2 Pp 87-94.

**Onwueme I. C. 1978.** The tropical tuber crops. Pub John Wiley and sons. Newyork Brisbane Toronto Pp 220-225.

**Oyenuga V. A. 1968.** Nigeria's Foods and Feeding Stuffs Ibadan University Press Pp1-90

**Rackis J.J., Anderson R. L., Sesame H. A., Smith A. K. and Van Etton C. H. 1961.** Amino acids in soybean hulls and oil meal fractions J. *Agric Food Chem.* 9:409-412.

**Weingartner K. E. 1989.** Nutrition of soybeans in Nigeria. In soybean utilization in Nigeria, Proc of the workshop held in AERLS ABU, Zaria Pp 46-52.