FOOD RESEARCH INSTITUTE
(C.S.I.R.)

# NUTRIENT COMPOSITION OF GHANAIAN COPRA ( *COCOS NUCIFERA)* CAKE SAMPLES

by


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## SUMMARY

The proximate composition and mineral content of samples of copra (*Cocos nucifera*) cake were carried out. The analysis involved the determination of calorific values, moisture, protein, fat, carbohydrate, ash, calcium and phosphorus.

## INTRODUCTION

Copra cake is a by-product in the extraction of coconut oil from copra (*Cocos nucifera*). In Ghana copra cake is used for animal feed. However, the fresh copra meal is eaten as it is for food or is boiled with sugar as a confectionery product. In other countries copra cake is chiefly used as animal feed in livestock and poultry industries. Copra cake has limited use for nitrogenous fertilizer. There is also a possibility of copra cake being used as a protein food for man according to Thieme (1968) and Woodroof (1970).

This article provides analytical data for the proximate composition and mineral contents of samples of Ghanaian copra cake.

## EXPERIMENTAL

### Materials

The copra cake samples were collected from coconut oil mills in Ghana. The samples were ground before the analyses.

### Methods

The copra cake samples were analysed for proximate composition and mineral contents. Moisture, protein, fat and ash were determined according to the methods of Pearson (1970) as follows:-

For moisture determination 5g portion of the copra cake sample was dried in nickel dish in air-oven at 105°C to constant weight. The difference between the weight of the wet and dry samples represented the moisture content. The protein content was determined on about 2g sample by the macrokjeldahl method. Fat was measured by Soxhlet extraction method on 5g portion.

The carbohydrate (including crude fibre) content is the difference between 100 and the sum of the moisture, protein, fat and ash contents. For energy values the conversion factor of one calorie equivalent to 4.184 Kilojoules was used.

The ash content was determined by igniting about 5g sample in a muffle furnace at 550°C. For the determination of the calcium and phosphorus the ash was dissolved in 10ml 5N HCl and made up to 50ml with water. A slightly modified method of the A.O.A.C. (1970) was used for the determination of calcium as follows:- Calcium was precipitated as the oxalate. The oxalate was dissolved in 2N-$H_2SO_4$ and the liberated oxalic acid was titrated against 0.02N-$KMnO_4$ solution.

Phosphorus was determined according to the method described by Fogg and Wilkinson (1958) on a measured volume of the ash solution. After reducing the molybdophosphate with ascorbic acid, the optical density was measured with a Coleman Model 8 Colorimeter in a 12mm cuvette using filter 8-215. The phosphorus content was calculated by reference to a standard curve.

Table 1: Nutrient Composition of ~~Ghana~~ Ghanaian Copra Cake Samples

| Name of Sample | Scientific Name | Calories per cent | Kilojoules per cent | Moisture % | Protein % | Fat % | Carbohydrate (Total including fibre) % | Ash % | Calcium mg/100g | Phosphorus mg/100g |
|---|---|---|---|---|---|---|---|---|---|---|
| Copra Cake | *Cocos nucifera* | 357 | 1493 | 10.2<br>(14)<br>8.6-12.1 | 20.6<br>(11)<br>18.1-25.7 | 12.6<br>(14)<br>7.5-12.8 | 50.6<br>(9)<br>48.6-56.4 | 6.0<br>(14)<br>5.5-6.7 | 90<br>(8)<br>60-120 | 513<br>(6)<br>237-982 |

The figures represent mean and range values

Figures in parentheses denote the number of samples analysed

## RESULTS AND DISCUSSION

Table 1 shows the nutrient composition of some Ghanaian copra cake samples. The figures have been compared with corresponding values for copra cake samples analysed in the United Kingdom, France and Germany reported by Thieme (1968).

The average moisture of the Ghanaian copra samples is 10.2% with the range of 8.6%–12.1%. The moisture ranges for copra cake samples analysed in France and Germany are 6.0%–12.0% and 10.0%–12.0% respectively.

The average protein content for the Ghanaian copra cake samples is 20.6% with the range 18.1%–25.7%. A copra cake sample from the United Kingdom gave a protein value of 21.2% while ranges of 19.0%–22.7% and 20.0%–22.0% were obtained for samples analysed in France and Germany respectively.

The Ghanaian copra cake samples were found to be high in fat with an average of 12.6% and a range of 7.5%–12.8% compared with a sample analysed in the United Kingdom (7.3%) and ranges of 0.7%–8.0% and 4.0%–7.0% for samples analysed in France and Germany respectively. This indicates that the oil from the Ghanaian copra has been partially extracted.

The protein and fat values of copra cake are important requirement in the formulation of animal feed whilst for fertilizer purposes the nitrogen content is needed.

The average ash content for the Ghanaian copra cake samples is 6.0% with a range of 5.5%–6.7% while that of a sample analysed in the United Kingdom is 5.9% with France and Germany registering range values of 5.0%–8.0% and 5.0%–7.0 respectively.

The averages of calcium and phosphorus contents of the Ghanaian samples are 90mg/100g and 513mg/100g respectively.

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