Walisongo Journal of Chemistry Vol. 7 Issue 2 (2024), 193-202
**ISSN:** 2621-5985 (online); 2549-385X (print)
**DOI:** https://doi.org/10.21580/wjc.v7i2.20619

# EVALUATION OF CHEMICAL AND NUTRIENT CONSTITUENTS OF COCOYAM AND SOYBEAN FLOURS AND THEIR BLENDS

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***Abstract***

*This study evaluated the chemical and nutritional compositions of processed cocoyam and soybean products, including their blends, to produce nutritionally rich products with economic value. The chemical compositions (proximate and mineral elements) were determined using standard methods, including flame photometry and atomic absorption spectrophotometry (AAS). The proximate composition (%) of the products was as follows: crude protein (4.95±1.03 – 43.29±0.46), ash (3.25±0.25 – 7.25±2.75), moisture (8.42±0.28 – 12.38±1.03), crude fiber (3.00±0.50 – 8.25±0.75), and nitrogen-free extract (10.60±7.34 – 76.02±1.83). Mineral elements (mg/kg) included: Fe (1.00±0.28 – 2.65±0.21), Zn (0.12±0.04 – 0.22±0.03), Cu (0.00±0.00 – 0.15±0.07), Na (0.35±0.05 – 2.40±0.14), Mg (3.45±0.43 – 12.88±0.55), Ca (4.80±0.42 – 10.55±0.64), K (39.65±2.33 – 56.25±0.78), and phosphorus (206.10±0.05 – 326.34±4.30). Hence, blending cocoyam flour with soybean flour resulted in products with enhanced nutritional value and the potential to stimulate agricultural production, particularly in rural areas, compared to using cocoyam or soybean flour individually.*

***Keywords:*** *(Colocasia esculenta), Soybean (Glycine max), Carbohydrates, Fats, Proteins.*

## Introduction

The objectives of this study included, among others, conducting chemical and nutritional assessments of cocoyam and soybean flours and their blends. It also aimed to evaluate the nutritional composition of cocoyam flour supplemented with soybean flour at different proportions (i.e., blends) of 10%, 20%, 30%, 40%, and 50%. Data relevant to the nutrient profiles of cocoyam and soybean flours, as well as their blends, were revealed in this study, which could encourage cocoyam and soybean farming. Despite the wide adaptability, nutritive value, and economic potential of cocoyam (*Colocasia esculenta*), it has received minimal interest and consideration from producers, consumers, and researchers. The capabilities of cocoyam for enhancing food security, generating income, and improving nutrition in households remain largely underexploited. Supplementing cocoyam flour with soybean (*Glycine max*) flour can enhance its nutritional value and economic benefits.

Food nutrients are essential for growth and development in humans and animals. Macronutrients provide the bulk of energy, while micronutrients act as co-factors for metabolism (Sizer & Whitney, 2022). Organic nutrients, such as carbohydrates, fats, proteins (or their building blocks, amino acids), and vitamins, play critical roles in human health (Eleazu et al., 2016). Malnutrition is a condition that arises when the body does not receive sufficient nutrients (Ifemeje et al., 2014). Cocoyam (*Colocasia esculenta*) is rich in vitamin B6 and potassium. It contains dietary fiber and has a higher protein content than most other tropical root crops (Braide et al., 2017). Traditionally, it is used to prepare various dishes. Vitamin B6 and potassium are particularly beneficial for regulating blood pressure and protecting heart health (Teede et al., 2018). Cocoyam is processed into flour, which serves as food and a substitute for wheat flour. Its leaves are commonly used in soups (Ekwe et al., 2018). The crop is also utilized to produce infant meals and foods for recuperating patients (Akobundu & Hoskins, 2014). Recent studies have revealed that cocoyam starch can be incorporated into weaning food that is both digestible and accessible to low-income earners in developing countries (Akobundu & Hoskins, 2014). Nutrient-dense foods like cocoyam are essential for maintaining a healthy immune system and aiding the body in utilizing carbohydrates, fats, proteins, and other nutrients (Salami et al., 2018).

Soybean (*Glycine max*) is notable for its high protein content, vitamins, minerals, and insoluble fiber. It contains significant amounts of iron, zinc, selenium, and antioxidants. Additionally, it is rich in vitamins and organic compounds, along with dietary fiber and protein (Adlercreutz, 2016). Soybean consumption has been associated with various health benefits, including protection against breast cancer and its treatment, primarily due to soybean isoflavones (genistein, daidzein, and glycitein) (Sarkar et al., 2020). Evidence also indicates that soybean helps alleviate hot flashes in menopausal women (Messina et al., 2016). Substantial data suggest that soybean isoflavones are largely responsible for many of the reported benefits of soybean-based foods (Kuiper et al., 2023).

## Methodology

### Materials

Analytical-grade sulfuric acid, potassium sulfate, copper sulfate, perchloric acid, nitric acid, and hydrochloric acid.

**Instruments:** Oven, muffle furnace, Soxhlet apparatus, Kjeldahl flask, spectrophotometer, flame photometer, and Buck Scientific Atomic Absorption Spectrophotometer (AAS).

### Preparation of Samples

Cocoyam (*Colocasia esculenta*) and soybean (*Glycine max*) were purchased from New Benin Market in Benin City, Edo State, Nigeria, and identified at the Plant Biology and Biotechnology and Crop Science Departments of the University of Benin, Benin City. Cocoyam tubers were peeled, sliced into pieces, and sun-dried for five days. Soybean seeds were also sun-dried for five days. Both the dried cocoyam and soybeans were milled separately. A wire whisk sieve with a 25 μm aperture size was used to sieve the flours to obtain homogeneous flours, which were then packaged in separate airtight containers.

### Proximate Analysis

The proximate composition of the cocoyam and soybean flours and their blends at different proportions (10%, 20%, 30%, 40%, and 50%) were determined using the standard methods of the Association of Official Analytical Chemists (AOAC) (2014) as follows:

### Moisture content

Two grams of each sample were dried in an oven at 105°C for 24 hours until constant weights were obtained. The loss in weight was taken as the moisture content (MC), which could be expressed as a percentage of the material. The dry matter (DM) content was determined as: 100 - %MC = %DM. The analyses were performed in triplicate, and the mean±standard deviation was calculated (AOAC, 2014).




Volume 7, Nomor 2, 2024

**Determination of crude protein**

A 0.5 g sample was weighed into a Kjeldahl flask, and 15 mL of sulfuric acid was added. A catalyst, made from a mixture of potassium sulfate ($K_2SO_4$) and copper sulfate in a ratio of 9:1, with a pinch of selenium, was also added. The mixture was placed on a heater in a fume cupboard and digested until it became clear, indicating that all nitrogen (except in nitrate and nitrite forms) was converted to $(NH_4)_2SO_4$. For distillation, the digest was diluted by adding 50 mL of water to the Kjeldahl flask to reduce acidity and was then made up to 100 mL. Five milliliters (aliquot) of the digest were placed in a digestion tube, and 5 mL of 40% NaOH were added. The mixture was heated and distilled into a flat-bottom flask containing 5 mL of boric acid solution until 150 mL of distillate was collected. The distillate was titrated with 0.01 M HCl to the endpoint. The nitrogen content of the material was calculated, and the crude protein content was determined by multiplying the nitrogen content by a factor of 6.25. The analyses were performed in triplicate, and the mean±standard deviation was calculated. The nitrogen and crude protein contents were calculated using the following formula:

$$\% \text{ N} = \frac{\text{Ma} \times \text{Va} \times 14 \times 100}{1000 \times \text{Wt of sample}} \quad (1)$$

Notes:
Ma = Molarity of acid
Va = Volume of acid obtained during titration
14 = Atomic weight of N
Wt = Weight of the sample
(AOAC, 2014).

**Determination of ether extracts (crude fat):**

A 2g sample was weighed into pre-weighed fat-free filter paper and placed inside a Soxhlet extractor. After extraction, the samples and filter paper were removed and dried in an oven at 105°C for 2 hours to complete the drying process. The filter paper and the samples were then weighed. Triplicate analyses were conducted, and the mean±standard deviation was calculated. The crude fat content was calculated as follows:

x = Weight of sample
a = Weight of filter paper + sample before drying
z = Weight of filter paper + sample after drying

$$\% \text{ crude fat} = \frac{a-z}{x} \times \frac{100}{1} \quad (2)$$

(AOAC, 2014).

**Ash content:**

A 2g sample was weighed into a crucible of known weight. The crucible and sample were then placed in a muffle furnace and ignited at 550°C until all organic content was removed.

The percentage ash content was calculated as follows:
Weight of sample = a gram
Weight of crucible + sample before ashing = b gram
Weight of crucible + sample after ashing = c gram

$$\% \text{ ash} = \frac{\text{weight of ash } (b-c)}{\text{weight of sample}} \times \frac{100}{1} \quad (3)$$

(AOAC, 2014).

**Determination of crude fiber:**

A 2g sample was weighed into a standard flask, into which 100 mL of 1.25% $H_2SO_4$ was added. The sample was boiled on a heating mantle for 30 minutes, with the 100 mL volume maintained by adding warm water using a wash bottle. After boiling, the flask was removed from the heating mantle, cooled, and filtered. The residue was washed to neutrality, which was confirmed using litmus paper. The method employed was acid-base hydrolysis (AOAC, 2014). The residue from the oven was placed in a muffle furnace at 300°C for 1 hour to ash the residue. After ashing, the sample was removed from the furnace, cooled in a desiccator, and weighed. Triplicate analyses were conducted, and the mean±standard deviation was calculated (AOAC, 2014).

The percentage of crude fiber was calculated as follows:

$$\% \text{ crude fiber} = \frac{\text{oven Wt of sample} - \text{furnace Wt of sample}}{\text{Wt of sample used}} \times \frac{100}{1} \quad (4)$$

**Nitrogen-free extracts (NFE):**

The NFE was calculated as follows:
% NFE = 100 – (% moisture + % crude protein + % crude fiber + % ash + % crude fat) (AOAC, 2014).

**Determination of mineral elements:**

The mineral element compositions of the samples were determined using atomic absorption spectrophotometry. A 0.5g sample was weighed into a Kjeldahl flask and heated with a mixture of concentrated $HNO_3$ + $HClO_4$ (in a 1:3 ratio) in a fume cupboard, with a pinch of selenium used as a catalyst. The heating continued until dense fumes of perchloric acid ($HClO_4$) and nitric acid ($HNO_3$) were driven off. The digest was cooled, diluted to 50 mL, filtered into a 100 mL rubber container, and then made up to 100 mL in the container. The sample digests were analyzed for magnesium, calcium, iron, copper, phosphorus, and zinc using a Buck Scientific Atomic Absorption Spectrophotometer (AAS). Sodium and potassium were determined using flame photometry, and phosphorus was analyzed using the molybdenum blue phosphorus method in conjunction with UV-visible spectrophotometry (Barnes, 2017).

**Moisture content:**

The values obtained were within the recommended moisture content specifications for soybean (12.50–13.50%) (FOS, 2023) and cocoyam flour (12.00–14.00%) (FAO/WHO, 2021). A progressive decrease in moisture content was observed as the percentage of soybean in the blends increased. This trend was attributed to the initially higher moisture content of unblended cocoyam flour. Moisture content is crucial because it influences foods' physical and chemical properties, particularly their freshness and storage stability (Barnes, 2017). The results revealed that the 50% blends had the lowest moisture content, suggesting that these blends were less prone to undesirable chemical reactions and microbial growth compared to the unblended cocoyam and soybean flours, as well as the 10%, 20%, 30%, and 40% blends.

**Crude protein:**

The cocoyam flour exhibited a low protein content of 4.95±0.02%, consistent with a previous report by Oyenuga and Fetuga (2014). In contrast, the soybean flour showed a higher protein content of 43.29±0.46%. Therefore, it was considered a good and cost-effective protein source compared to conventional animal-based proteins such as milk, meat, and eggs. A study on the proximate composition of cocoyam (*Colocasia esculenta*) by Folade and Okafor (2014) reported a crude protein value of 5.50%, slightly higher than the 4.95% obtained in the present study. Similarly, Ogbemudia et al. (2017) reported a crude protein value of 36.69% for soybean, lower than the 43.29% obtained in this analysis. These variations could be attributed to factors such as location, product variety, and post-harvest handling. The Recommended Daily Allowance (RDA) for protein are 56 g/day for an adult man and 46 g/day for an adult woman (USAD, 2015). The quantities of the samples required to meet the RDA for men and women, as indicated in Table 2, are 1,131 g/day and 929.29 g/day for unblended cocoyam flour, and 129.36 g/day and 106.26 g/day for unblended soybean flour, respectively.

**Results and Discussion**

It can be recognized that as the proportion of soybean in the blends increased, the amounts of the blends needed to meet the RDA decreased. This condition was attributed to the higher initial protein content of soybean compared to cocoyam flour. Proteins are required to maintain body tissues and are integral to the enzyme and hormonal systems (Ukhun, 2018). They perform various biological functions, including acting as structural materials in hair, skin, nails, and similar ectodermal structures, as well as constituting an integral part of muscle. Insufficient intake of high-quality protein results in poor growth in animals (Ukhun, 2018). The protein contents of the soybean and cocoyam samples should be appreciated in light of these considerations.

**Notes:**
10% blend of soybean and cocoyam flour, for example, means 10% of soybean flour and 90% of cocoyam flour.

samples, and other possible factors. The RDA for fats, as recommended for humans, are 44–77 g/day. The calculated amounts for the samples examined in this study, which were expected to meet the RDA, are depicted in Table 3.

The crude fat represents the lipid or fat fraction. Because it contains materials

**Table 1**. Proximate Composition of Cocoyam and Soybean Flours and Their Blends (%)

| Samples | Moisture Content | Crude Protein | Crude Fat | Ash | Crude Fiber | NFE |
|---|---|---|---|---|---|---|
| Unblended cocoyam flour | 12.38±1.03 | 4.95±0.02 | 0.40±0.03 | 3.25±0.25 | 3.00±0.50 | 76.02±1.83 |
| Unblended soybean flour | 12.30±3.00 | 43.29±0.46 | 18.31±0.38 | 7.2 5±2.75 | 8.25±0.75 | 10.60±7.34 |
| 10% blend of soybean and cocoyam flours | 12.37±0.28 | 12.25±1.75 | 0.82±0.05 | 3.48±0.08 | 3.50±1.00 | 71.53±3.16 |
| 20% blend of soybean and cocoyam flours | 12.36±0.18 | 14.88±0.88 | 2.29±0.07 | 3.63±0.07 | 4.65±0.15 | 65.60±1.35 |
| 30% blend of soybean and cocoyam flours | 12.36±1.22 | 15.75±1.00 | 3.38±0.16 | 3.75±0.05 | 4.78±0.21 | 63.16±1.64 |
| 40% blend of soybean and cocoyam flours | 12.35±2.70 | 16.63±2.62 | 5.05±0.07 | 3.93±0.03 | 4.84±0.16 | 57.85±5.58 |
| 50% blend of soybean and cocoyam flours | 12.34±0.70 | 24.50±1.75 | 8.45±1.11 | 4.03±0.18 | 5.38±0.28 | 49.18±4.03 |

NFE = Nitrogen-free extract.

Crude fat: The unblended soybean flour had a higher crude fat content (18.31±0.38%) than the unblended cocoyam flour, which had a value of 0.40±0.03%. The fat content increased progressively as the proportion of soybean in the blends increased. The lowest value was observed in unblended cocoyam flour, followed by blends containing 10%, 20%, 30%, 40%, and 50% soybean. A similar analysis of the proximate composition of cocoyam by Folade and Okafor (2014) reported 0.98% crude fat, compared to the 0.40% amount observed in this study. In contrast, soybean gave a value of 28.20% crude fat in a report by Ogbemudia et al. (2017), compared to the 18.31% amount observed in this study. These differences might be attributed to the variety of the products, locational differences of the

other than true fat, it is referred to as crude fat (Gundermann et al., 2014). Therefore, the values in Tables 1 and 3 should be interpreted with these considerations.

Ash: The results indicated an increase in ash content as the percentage of soybean flour in the blends increased. Therefore, soybean appeared to be a better source of ash than cocoyam, as shown in Table 1. The mineral element profile, recommended daily allowance (RDA), and the quantities of each sample required to meet or supply the RDA are presented in Table 5.

Mineral elements: The profiles of mineral elements in various soybean and cocoyam products, along with the amounts required to meet the Recommended Daily Allowance (RDA), are presented in Tables 3 and 4. The values for soybean flour and various blends of soybean and cocoyam

**Table 2.** Amounts of Samples Required to Meet the RDA for Proteins

| Samples | Crude Protein (%) | RDA (g/day) | Amount Needed to Meet RDA (g/day) | |
|---|---|---|---|---|
| | | | Men | Women |
| Unblended cocoyam flour | 4.95 | | 1.131 | 929.29 |
| Unblended soybean flour | 43.29 | | 129.36 | 106.26 |
| 10% blend of soybean and cocoyam flours | 12.25 | | 457.14 | 375.51 |
| 20% blend of soybean and cocoyam flours | 14.48 | Men = 56g/day | 376.34 | 309.14 |
| 30% blend of soybean and cocoyam flours | 15.75 | Women = 46g/day | 355.56 | 292.06 |
| 40% blend of soybean and cocoyam flours | 16.63 | | 336.74 | 276.61 |
| 50% blend of soybean and cocoyam flours | 24.50 | | 228.57 | 187.76 |

**Table 3.** Amounts of Samples Required to Meet the RDA for Fats

| Samples | Crude Fat (%) | RDA (g/day) | Amount Needed to Meet RDA (g/day) |
|---|---|---|---|
| Unblended cocoyam flour | 0.40 | 44-77g/day | 11,000 – 19,250.00 |
| Unblended soybean flour | 18.31 | | 240.31 – 420.54 |
| 10% blend of soybean and cocoyam flours | 0.82 | | 5,365.85 – 9,390.24 |
| 20% blend of soybean and cocoyam flours | 2.29 | | 1,921.40 – 3,362.45 |
| 30% blend of soybean and cocoyam flours | 3.38 | | 1,301.78 – 2,278.11 |
| 40% blend of soybean and cocoyam flours | 5.05 | | 871.29 – 1,524.75 |
| 50% blend of soybean and cocoyam flours | 8.45 | | 520.71 – 911.24 |

**Table 4.** Mineral Element Contents of Cocoyam and Soybean Flours and Their Blends (mg/kg).

| Samples | Na | Mg | Ca | K | Fe | Zn | Cu | P |
|---|---|---|---|---|---|---|---|---|
| Unblended cocoyam flour | 2.40±0.14 | 3.45±0.43 | 4.80±0.42 | 40.80±0.85 | 1.00±0.28 | 0.12±0.04 | 0.15±0.07 | 305.16±7.12 |
| Unblended soybean flour | 1.50±0.03 | 12.88±0.53 | 10.55±0.64 | 56.25±0.78 | 2.65±0.21 | 0.22±0.03 | 0.10±0.03 | 326.34±4.30 |
| 10% blend of soybean and cocoyam flours | 0.35±0.05 | 7.13±0.88 | 5.60±0.14 | 39.65±2.33 | 1.03±0.28 | 0.13±0.04 | 0.10±0.02 | 206.10±0.05 |
| 20% blend of soybean and cocoyam flours | 0.40±0.14 | 7.75±1.14 | 6.55±0.07 | 42.50±0.28 | 1.05±0.07 | 0.14±0.01 | 0.00±0.00 | 256.19±1.29 |
| 30% blend of soybean and cocoyam flours | 0.55±0.03 | 8.50±1.41 | 7.75±0.14 | 45.10±0.42 | 1.25±0.21 | 0.19±0.04 | 0.00±0.00 | 281.06±1.19 |
| 40% blend of soybean and cocoyam flours | 0.60±0.02 | 9.38±0.18 | 8.50±1.20 | 43.30±0.71 | 1.35±0.07 | 0.22±0.03 | 0.00±0.00 | 296.02±2.02 |
| 50% blend of soybean and cocoyam flours | 0.68±0.07 | 10.25±0.35 | 9.38±0.07 | 46.15±1.34 | 1.80±0.57 | 0.17±0.02 | 0.10±0.02 | 301.14±1.21 |

**Table 5.** Mineral Element Profiles (mg/kg), Recommended Daily Allowance (RDA), and Sample Amounts to Meet the RDA in Food Samples (mg/kg)

| Elements | Unblended cocoyam flour | | Unblended soybean flour | | 10% blend of soybean and cocoyam flours | | 20% blend of soybean and cocoyam flours | | 30% blend of soybean and cocoyam flours | | 40% blend of soybean and cocoyam flours | | 50% blend of soybean and cocoyam flours | | RDA (mg/day) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RDA (g) | | RDA (g) | | RDA (g) | | RDA (g) | | RDA (g) | | RDA (g) | | RDA (g) | |
| **Na** | 2.40 | 625 | 1.50 | 1,00 | 0.35 | 4,286 | 0.40 | 3,750 | 0.55 | 2,727 | 0.60 | 2,500 | 0.68 | 2,206 | 1,500 |
| **Mg** | 3.45 | 116 | 12.88 | 31,0 | 7.13 | 56,101 | 7.75 | 51,612 | 8.50 | 47,058 | 9.40 | 42,553 | 10.25 | 39,024 | 400 |
| **Ca** | 4.80 | 250,000 | 10.55 | 113,744 | 5.60 | 214,286 | 6.55 | 183,205 | 7.75 | 51,613 | 8.50 | 47,059 | 9.38 | 42,643 | 1,200 |
| **K** | 40.80 | 115,196 | 56.25 | 83,556 | 39.65 | 188,537 | 42.50 | 110,588 | 45.10 | 292,682.3 | 43.30 | 224,300 | 46.15 | 101,841.2 | 4700 |
| **Fe** | 1.00 | 8,000 | 2.65 | 3,019 | 1.03 | 7,767 | 1.05 | 7,619 | 1.25 | 6,400 | 1,35 | 5,926 | 1.80 | 4,444 | 8 |
| **Zn** | 0.12 | 91,667 | 0.22 | 50,000 | 0.13 | 84,615 | 0.14 | 78,571 | 0.19 | 57,897 | 0.22 | 50,000 | 0.17 | 64,706 | 11 |
| **Cu** | 0.15 | 6,000 | 0.10 | 9,000 | 0.10 | 9,000 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 900 |
| **P** | 305 | 2,294 | 326 | 2,145 | 206 | 3,396 | 256 | 2,732 | 281 | 2,491 | 296 | 2,365 | 301 | 2,325 | 700 |

flour containing higher proportions of soybean revealed higher levels of these mineral elements. They are essential for health and the maintenance of several human body functions, such as transporting oxygen, normalizing the nervous system, and stimulating growth (Owusu-Darko et al., 2014). The RDA for iron is 8 mg/day; it is a component of cytochromes critical for energy production and enzymes involved in the immune system. Zinc and copper levels in the samples were low; both were trace elements. The RDA for copper is 900 µg/day for adults (Mandal et al., 2019), and all the samples analyzed in this study fell within the recommended range for human consumption. Therefore, the relevance of the data presented in this study was both apparent and compelling.

Crude fiber: The results revealed that cocoyam flour had a lower crude fiber content than soybean flour. Variations in the crude fiber levels of the different blends of soybean and cocoyam flour are evident in Table 3. The values for the blended products established a correlation with the initial values of the unblended soybean and cocoyam flours, respectively. A similar report on the proximate composition of cocoyam by Folade and Okafor (2013) recorded a crude fiber value of 3.00%, which aligned with the 3.00% obtained for cocoyam flour in the present study. However, the crude fiber value for soybean reported in the literature (Ogbemudia et al., 2017) was 5.44%, compared to 8.25% obtained in this study. The importance of blending is evident in the data presented so far. Furthermore, a product low in a particular nutrient can be blended with another product high in that nutrient to improve the nutritive value of the former. For example, adding soybean flour, which is rich in protein, to cocoyam flour, which is rich in carbohydrates, can enhance protein delivery to populations, particularly young and growing individuals, while maintaining the organoleptic acceptability of the cocoyam flour to consumers. Accordingly, the fiber contents reported in this study were of notable value.

NFE (Nitrogen-free Extract): The findings demonstrated that cocoyam flour had the highest NFE value (76.02±1.83%), while soybean flour had the lowest (10.60±7.34%). These values were consistent with the initial values of unblended soybean and cocoyam flours. The carbohydrate content decreased as the proportion of soybean in the blends increased. NFE represents the nutritionally available carbohydrates in foods. Since carbohydrates are substantial sources of calories for the body, knowledge of the NFE value of a food sample is a good indicator of its caloric potential for human and animal nutrition. Thus, the significance of the NFE data presented in Table 1 is established.

## Conclusion

This study demonstrated that cocoyam and soybean flours, as well as their various blends, could serve as excellent sources of essential nutrients, including proteins, carbohydrates, and fats. The protein content of cocoyam flour could be significantly enhanced by blending it with soybean flour at a 50% proportion. While cocoyam is rich in carbohydrates, soybean is abundant in proteins. As observed in this study, their combination could produce a new product with higher nutritive value. The use of chemical composition data to calculate the Recommended Daily Allowance (RDA) values for nutrients such as proteins, carbohydrates, and mineral elements in soybean and cocoyam products, as conducted in this study, holds practical significance. It can be instrumental for home and institutional applications in managing various health conditions, where necessary and appropriate.

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