Agricultural Sciences, 2022, 13, 973-988
https://www.scirp.org/journal/as
ISSN Online: 2156-8561
ISSN Print: 2156-8553

Potato (*Solanum tuberosum* L.) Flour Enriched with Date Palm Fruit (*Phoenix dactylifera* L.) Powder and Bean Milk for Cookies Production

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How to cite this paper: Akhobakoh, M., Zing Zing, B., Ngatchou, A., Mbassi, J.E.G. and Nchanji, E.B. (2022) Potato (*Solanum tuberosum* L.) Flour Enriched with Date Palm Fruit (*Phoenix dactylifera* L.) Powder and Bean Milk for Cookies Production. *Agricultural Sciences*, **13**, 973-988.
https://doi.org/10.4236/as.2022.139060

Received: July 21, 2022
Accepted: September 6, 2022
Published: September 9, 2022

Abstract

This study emphasizes the formulation of three types of cookies viz potato flour with date powder and bean milk (PDBM), potato flour with sugar and bean milk (PSBM), and potato flour, sugar, and eggs as control. After the substitution, the highest protein content was observed in PDBM (1.78 ± 0.12)% followed by PSBM, (1.35 ± 0.01)% and the lowest was in the control (0.91 ± 0.55)%. Moreover, cookies fortified with date palm powder increased the carbohydrate and fat contents compared to the control and significantly increased the calorific value of PDBM. The formulated cookies were significantly higher ($p < 0.05$) in iron (39.95 ± 3.00) mg/100 g and zinc (13.65 ± 1.61) mg/100 g in PDBM compared to other cookies. The date palm powder incorporated in cookies significantly increases the darkening of biscuits during cooking. The organoleptic characteristics of PDBM and PSBM were rated overall best when specific parameters were tested. With the shortage of wheat and importation constraints, an alternative provides a great market opportunity for local products like potatoes and beans. In addition, fortifying food products as cookies eaten by all will contribute to a more food and nutrition-secured world.

Keywords

Potato Flour, Date Palm, Cookies, Bean Milk, Physical Color, Sensory Evaluation, Food and Nutrition Security

1. Introduction

Common Bean is one of Cameroon's widely grown and consumed food legumes

and a vital source of protein (22.7%), B vitamins, and minerals. Regular consumption of common beans decreases the risk of coronary heart disease, diabetes, colorectal cancer, and aids in weight management [1]. Annually, 402.054 metric tons of beans are produced and consumed in the country, with some exported to Central Africa Republic, Gabon, Equatorial Guinea, and Nigeria [2]. However, the long-term storage of the bean grain is constrained by several endogenous and exogenous factors in general and in particular insufficient storage facilities leading to significant post-harvest losses of more than 30% and consequently, the reduction of their quality leading to shorter shelf life. Solutions have been put in place to reduce post-harvest losses and increase their shelf life through value addition [3]. The use of vegetable proteins derived from beans that can be transformed into various products such as flours [4] [5], for the development of nutrient-rich cookies as a viable alternative for raising nutritional levels [6].

The term cookies, or biscuits as they are called in many parts of the world, refers to a baked product generally containing the three major ingredients flour, sugar and fat [7]. They are popular examples of bakery products or ready-to-eat snacks that possess several attractive features such as long shelf life, nutrient-rich, and convenience making them widely consumed [8]. Cookies are chemically leavened products that, if combined with other nutritious products, transform them into healthier snacks to meet changing diets [9]. Cookies and other bakery products have become preferred fast-food products for every age and group because they are easy to carry around, reasonably cheap, tasty, with some made cholesterol-free, contain digestive and dietary principles of vital importance, and can be made from hard, sweet, or soft dough [10]. In addition, cookies contain high sugar content, shortening, and little water. Unlike other baked foods such as bread and cakes, cookies have low moisture content making them comparatively free from microbial spoilage and thus longer shelf life [8]. Part of the main ingredients of cookies such as wheat flour, fat (margarine), sugar, water, milk, salt, aerating agent, emulsifier, etc. can be enriched or fortified with other ingredients to meet consumers' specific nutritional or therapeutic needs [11]. Unfortunately, most cookies in the market are made from bleached flour, with little or no health benefits. Bleaching of flour leads to loss of minerals and vitamins and causes the production of alloxan which can induce diabetes in humans [12].

Potato (*Solanum tuberosum* L.) is a seasonal crop grown in most countries and continents except in Antarctica. It is a source of starch in the food industry, it's a manufacturing glue, and a staple food for animals and the human diet [13] [14]. The long-term storage of potatoes for industrial processing often leads to their sprouting. The sprouting of potatoes causes increased weight loss, impedes air movement through the potato pile, and reduces the nutritional value of potatoes by converting starch to sugar [15]. Therefore, it is important to avoid sprouting during storage by transforming potatoes into flour to limit food wastage and increase food security.

Dehydrating fresh potatoes by making potato flour is one effective solution to overcome these problems [16]. Potato has a protein of high biological value, and a favorable caloric ratio, and is an important source of vitamins and minerals [17] [18]. In, addition, potato flour presents great versatility and functions as an enhancer of flavor and color [19]. Thus, many studies have used potato flour to substitute wheat flour [20] [21] [22]. For instance, Joshi *et al.* [23] and Lingling *et al.* [24] argue that, flour can be safely stored and incorporated into various bakery products, particularly cookies, bread, and cakes [25] [26]. Furthermore, Zhu *et al.* (2019) showed that the glycemic index of potato foods is relatively lower than that of wheat foods [27]. Even though sugar is the second primary ingredient used in cookie production, it causes metabolic issues such as type II diabetes, obesity, etc. due to its high calories with no essential nutrients. In 2016, 13% of the global adult population was classified as obese, with 39% of adults aged 18 and up classified as overweight (WHO, 2017) [26]. As a result, the food industry has become motivated to modify product formulations through sugar and fat reduction in order to aid consumer welfare while maintaining sensory appeal and purchase intent. Therefore, it has become urgent to find natural substitutes for sucrose.

Date Palm fruits (*Phoenix dactylifera* L.) belong to the family of Arecaceae [27]; they are sweet edible fruits containing more than 70% sugar in which glucose and fructose are predominant [28] [29]. However, date fruits have a great nutritional benefit to diabetics and other metabolic health-related patients because they are rich in fiber, iron, calcium, copper, magnesium, potassium, antioxidant flavonoids such as beta-carotene, lutein, and zeaxanthin, and vitamins A and B2 [10] [30]. Cookies enriched with beans milk using date palm fruit will not only reduce post-harvest waste but also add economic, nutritional, and health values. Therefore, this work explores the possibility of using potato flour, bean milk and date palm fruit to replace wheat flour, eggs and sugar respectively in cookies production. This study aims to produce and evaluate the nutritional properties and sensory attributes of formulated cookies recipes at different ratios.

2. Materials and Methods

The potato (*Solanum tuberosum* L.) tuber of cultivar 9733 Variety and Common bean (*Phaseolus vulgaris* L.) MAC 33, red mottled biofortified (high iron and zinc) bean variety were obtained from the Multipurpose Research Station of the Institute of Agricultural Research for Development (IRAD-Dschang and IRAD-Foumbot) in the West Region. The date palm fruit (*Phoenix dactylifera* L.)*;* and other ingredients, such as butter, baking powder, sugar, eggs, salt, and vanilla essence were all bought from a local market in Yaounde, Cameroon.

2.1. Production of Bean Milk

The common bean (*Phaseolus vulgaris* L.) milk production process was mod-

ified from the method previously described by Calvince *et al.* [31] as shown in Figure 1. Briefly, the common bean (1000 g) was throughly cleaned, rinsed, and soaked in 3000 mL of tap water for 18 hours at room temperature (27˚C). The soaked common bean seeds were drained, rinsed, dehulled by hands, and ground in a commercial blender. Water was added to make a common bean slurry with a ratio of 1:3 (mass:volume = m:v). The resulting slurry was passed through two layers of muslin cloth to filter the water-soluble common bean milk material from other insoluble matter. The strained milk was heated in a heavy bottom pan to 100˚C, and this temperature was held for 20 min, frequently stirring to prevent sticking. The heated bean milk was placed at room temperature (≈25˚C) to be cooled for 6 hours and stored at 4˚C before use. 100 g of cooled bean milk were poured into 5 petri dishes, and introduced into an oven (Panasonic MOV-212) for dehydration at 50˚C for 20 - 25 minutes. This dried bean milk was cooled and stored in a desiccator at ambient temperature for a day before chemical analyses.

2.2. Production of Potato Flour

Edible potato flour was prepared (Figure 2) from raw potato tubers by selecting, cleaning, washing, peeling, and slicing into 0.5 cm chips, followed by oven drying (55˚C for 24 hours) and later powdering. The flour was sieved (30-mesh size) to obtain a fine grade sample. The flour samples were kept in a sealed and clean plastic and stored at 4˚C for further use.

2.3. Production of Date Fruit Palm Powder

The date palm fruit (*Phoenix dactylifera* L.) pulp (powder) was produced as shown in Figure 3. The date palm fruits were thoroughly washed with water to

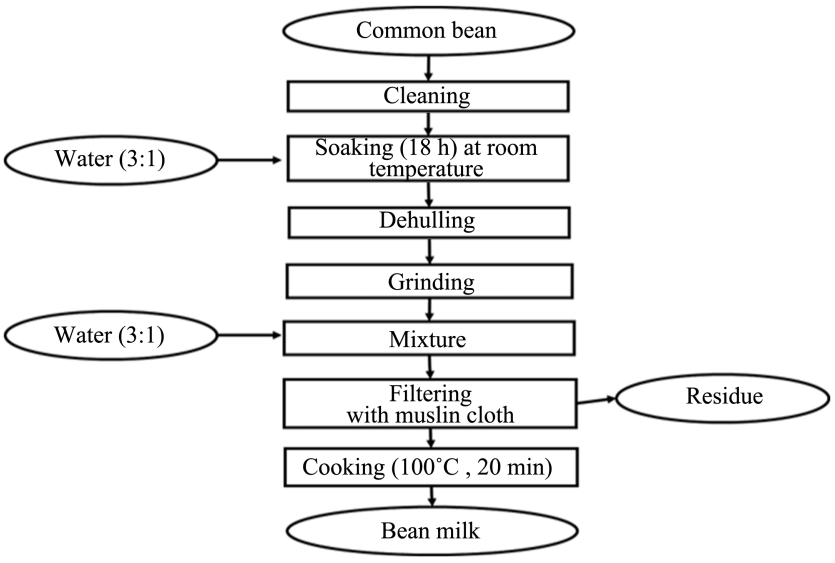

Figure 1. Schematic presentation of the bean milk production process adopted from Calvince *et al.* (2019).

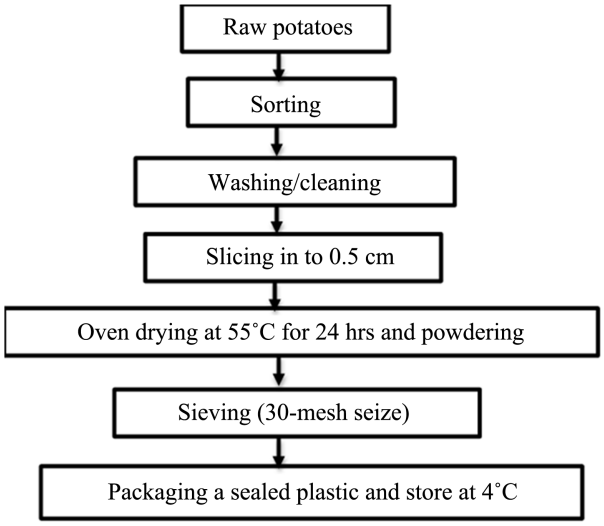

Figure 2. Schematic presentation of the potato flour production.

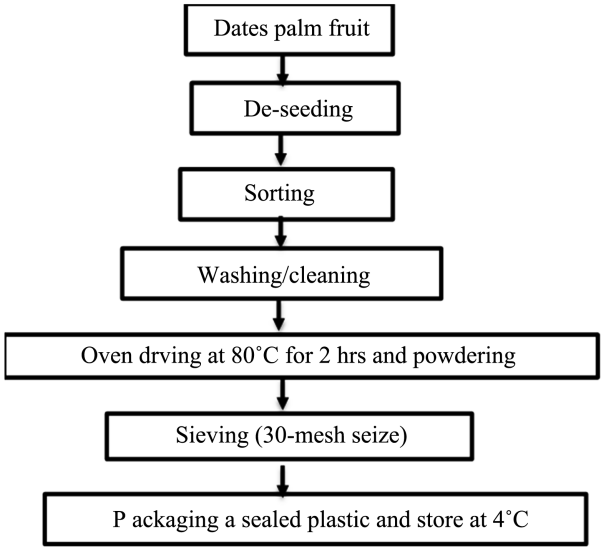

Figure 3. Schematic presentation of the date fruit palm flour by Ikechukwu *et al.* (2017).

remove adhering dirt, followed by removing the seeds (de-pitting) of the fruit manually and cutting into small pieces with a knife and weighed the dried date palm fruit. The pulp with pericarp was then oven-dried at 80˚C for 2 hours and subsequently milled using a hand milling machine. The flour was sieved (30-mesh size) to obtain a fine grade sample. The flour samples were kept in sealed plastic and stored at 4˚C for further use.

2.4. Production Process of Cookies

Table 1 illustrates the different quantities of formulated cookies. These formulated cookies were made with 100% potato flour with sugar and eggs, which served as the control (Control), potato flour cookies with date powder and bean milk (PDBM) and potato flour cookies with sugar and bean milk (PSBM). The

Table 1. Ingredients formulation (g) for biscuit production.

Ingredients	Types of biscuits		
	Cookies PDBM	Cookies PSBM	Cookies control
Potato flour (g)	200	200	200
Butter (g)	140	140	140
Sugar (g)	0	66.7	66.7
Date flour (g)	66.7	0	0
Eggs (g)	0	0	47.07
Bean milk (g)	29.69	29.69	0
Aroma (vanilla) (g)	3.36	3.36	3.36
Salt (g)	0.7	0.7	0.7
Yeast	0	0	3.3

PDBM: Cookies of potato flour + dates powder + beans milk; PSBM: Cookies of potato flour + sugar + beans milk; Control: Cookies of potato flour + sugar + eggs.

cookies were prepared following the method described by Eyenga *et al.* [32] with little modification. More specifically, butter was put in a clean bowl and creamed throughly with a stainless-steel spatula till it became soft and smooth. Powdered sugar was added and creamed for a homogenous mixture. Potato flour was mixed with salt, this flour-baking powder-salt mixture was added to the butter-sugar or date powder mixture and homogenized with the spatula to form a paste. Depending on the cookie products to be obtained, eggs or bean milk and liquid flavor were then added, and the mixture was stirred to obtain the final cookie dough. The dough was put into the cookies mold, and the desired cookie shapes formed on a tray lightly greased with butter. The cookie-filled trays were put into an oven (Panasonic MOV-212) set at 160˚C and baked for 20 - 25 min. The light brown baked cookies (**Figure 4**) were removed and put in a large tray and allowed to cool at room temperature before packaging. They were packaged in high-density polyethylene, labeled and stored at ambient temperature for various analyses.

2.5. Nutritional Analysis

Chemical analyses were done on bean-derived products and cookies samples. The total nitrogen was measured using the Kjeldahl method. The factor 6.25 was applied to all the values of nitrogen to deduce the total proteins (Equation (1)). The total carbohydrates were determined by the anthrone method [33]. The total fat and moisture content was calculated using the standard Association of Official Analytical Chemists methods (AOAC, 2005) [34]. The mineral content (Ca, Mg, Fe, Zn) was determined by atomic absorption spectrophotometry (Varian Vista, Victoria, Australia). The caloric value (Equation (2)) was determined as suggested by Mendes *et al.* [35].

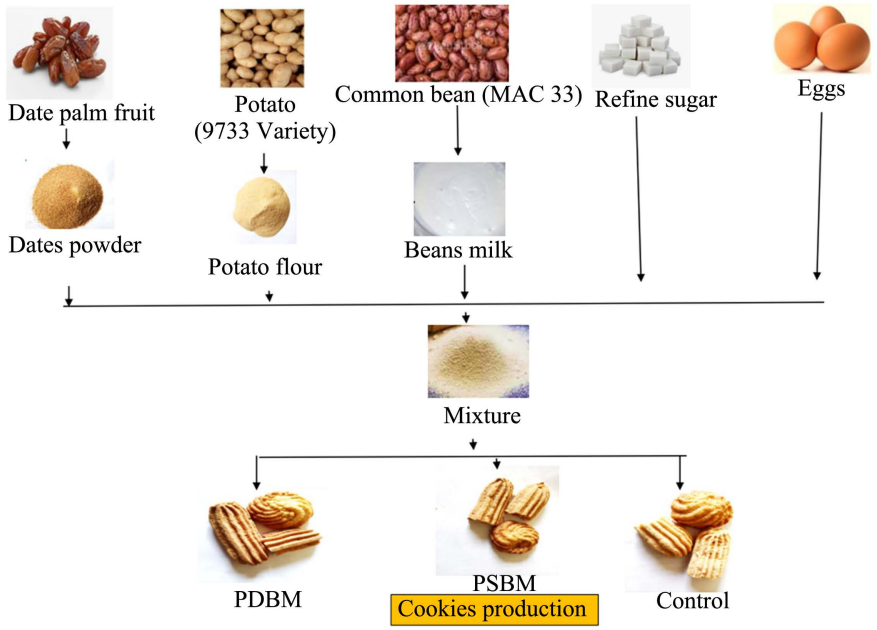

Figure 4. Ingredients and cookies produced.

$$\text{Total proteins} = \text{Total nitrogen} \times 6.25 \quad (1)$$

$$\text{Caloric Value} = [(\text{Total proteins} + \text{total carbohydrate}) \times 4 + \text{total lipid} \times 9] \quad (2)$$

2.5.1. Physical Characteristics of Cookies

The color value of different cookies was estimated using a Hunter's Lab color analyzer (Hunter lab scan XE, Reston, VA, USA). In the Hunter colorimeter, the color of a sample is designated by the three dimensions, L*, a*, and b*. This color was measured by placing the aperture of the equipment on the sample with white paper as the reference. L*, a*, and b* indicates lightness, redness (+)/greenness (−), yellowish (+)/blueness (−) of the sample, respectively. The color of the samples was measured after placing the samples in front of the tiniest opening [36]. To obtain data reflecting the color of the samples, different points were taken into consideration for each sample. All data were collected with three replications.

2.5.2. Sensory Quality Evaluation of Cookies

The cookies prepared by incorporating potato flour and substituting sugar with dates and eggs with bean milk were evaluated for their sensory characteristics based on the intensity of aroma, basic taste (sweet, salty, acidity, bitterness), texture (granular, fat, crispy, creamy, fondant) by a total of ten (10) trained panelists (6 women and 4 men). The sensory test was carried out in the Food Technology Laboratory of IRAD. The potato cookies were coded and presented to the panelists. The taste quality was evaluated on a 6-point hedonic scale. As shown in **Table 2**, parameters were scored using a used a six-point rating from ("0 = absent" to "5 = very high") to evaluate the intensity of basic taste, aroma, and texture.

Table 2. Description of scale.

Scale	Perception of taste, texture and aroma	Overall quality
0	Absence	Very bad
1	Very low	Bad
2	Low	Not so good
3	Normal	Good
4	High	Very good
5	Very high	Excellent

A six-point scale was also used to evaluate the overall quality of the cookies from "0 = very bad" to "5 = excellent." Drinking water was prepared for panelists, and they were asked to rinse their mouths after tasting each cookie sample. The sensory analysis was performed three times.

2.6. Data Analysis

For an overview of the significance of the data, all of them were subjected to a one-way ANOVA on the triplicate at $p \leq 0.05$ and a 95% confidence limit using XLSTAT version 2020.1.2. Graphs and Radar charts were generated in Excel 2018 software (Office 365, Microsoft Corp) from the color and sensory analysis results to determine differences in L*, a*, and b* color variables and attributes between the formulated biscuits.

3. Results and Discussion

3.1. Nutritional Value Analysis of the Formulated Cookies

The physicochemical characteristics of the formulated cookies, date palm fruit powder, and bean milk are represented in **Table 3**.

These results showed that there were no significant ($p \geq 0.05$) differences observed between total proteins, total carbohydrate, and moisture content of PDBM and PSBM. The highest protein content was observed in PDBM (1.78 ± 0.12)% followed by PSBM, (1.35 ± 0.01)%, and the lowest was in the control (0.91 ± 0.55)%. The protein content increased as eggs were replaced with bean milk. The highest protein content in the PDBM could come from the association of the beans milk and date palm fruit powder.

Regarding the total fat, there was a significant difference ($p < 0.05$) between the cookie samples, date powder, and bean milk. The fat content of date powder (0.02 ± 0.006) in the current study was far lower than the results found by Gamal *et al.* and Ghnimi *et al.* which were in the range of 0.1% to 0.4% [37] [38]. This difference could be due to the variety and climate as stated by Al-Shahib *et al.* [39]. Fat contents were significantly higher (43.80 ± 1.40)% in the PDBM than in control (31.00 ± 1.80)% and PSBM (29.20 ± 1.91)%. This shows that the substitution of eggs with bean milk significantly increased the lipid content of

Table 3. Mean values for proximate composition of the different formulated cookies, date palm fruit powder and bean milk.

Products	Total proteins (%)	Total fats (%)	Total carbohydrate (%)	Moisture content (%)	Caloric value Kcal
Control	0.91 ± 0.55^{a}	31.00 ± 1.80^{e}	21.25 ± 1.06^{d}	4.72 ± 0.01^{bc}	367.64 ± 2.00^{b}
PDBM	1.78 ± 0.12^{b}	43.80 ± 1.40^{d}	39.87 ± 0.06^{b}	3.90 ± 0.06^{a}	560.8 ± 2.21^{ab}
PSBM	1.35 ± 0.01^{b}	29.20 ± 1.61^{c}	27.25 ± 0.02^{c}	3.92 ± 0.01^{a}	377.2 ± 2.34^{ab}
Dates flour	$0,46 \pm 0.06^{a}$	0.02 ± 0.006^{a}	$32,92 \pm 1.80^{e}$	7.14 ± 2.00^{d}	133.7 ± 1.67^{a}
Bean milk	23.50 ± 1.06^{c}	2.10 ± 1.06^{b}	2.92 ± 0.01^{a}	6.16 ± 0.55^{b}	124.58 ± 1.56^{a}

Values are means ± SD (standard deviation) of triplicate determinations. Different superscript letters within the same column indicate statistical significance ($p < 0.05$).

cookies. Fat contents of cookies produced with date powder were higher than that of cookies produced with sugar. These results are in the same line with Ikechukwu *et al.* [40] who state that the percentage of fat contents in cookies increased with the presence of date palm pulp.

Date fruits are a rich source of carbohydrates, and their quantity varies in different varieties [41]. In this study, the carbohydrate content of the date powder was (32.92 ± 1.80)%, which was lower than the results previously reported for some date varieties [42]. This difference may be due to genetic differences, time of harvest, fertilizers, soil mineral availability, or climatic and environmental factors. There were significant ($p \leq 0.05$) differences in carbohydrate contents of cookie samples compare to the control. The results indicated that there were increases in the carbohydrate content as the sugar was replaced by date powder, as demonstrated by Tawfek *et al.* [43]. Carbohydrates were significantly higher ($p < 0.05$) in potato-based cookies fortified with bean milk and date pulp (39.87 ± 0.06)% than that of PSBM (27.25 ± 0.02)% and control cookies (21.25 ± 0.96)%. This was expected as the date is a richer source of carbohydrates than the bean. These results tally with those reported by Ikechukwu *et al.* who found that the carbohydrate value of cookies increased with an increase in the percentage of date palm pulp [44]. The carbohydrate value of PDBM was lower than the value (64.77 ± 0.24)% obtained by Dimir *et al.* [45] in the sweet potato flour as a substitute for wheat flour and sugar in cookies production.

The moisture contents of the formulated cookies ranged from 3.90% to 4.72%. The lowest moisture content was from the PDBM (2.90 ± 0.06)% followed by PSBM (3.92 ± 0.01)%. On the other hand, the moisture content of the control (4.72 ± 0.01)% is significantly different and the reduction in moisture content in PDBM could be due to the presence of date palm pulp in that sample. This result is in line with the findings reported by other researchers that high incorporation of date palm pulp binds water due to high sugar content, hence lower moisture content [46].

The calorific values of the cookie samples ranged from (367.6 ± 2.00) to (336560.8 ± 2.21) Kcal. The highest calorific values were obtained from PDBM. The high calorific value in PDBM could be because date palm fruit contains sugar like fructose and dextrose as stated by Dada *et al.* [28]. This shows that the fortification of potato flour with date palm powder is a welcome development for the improvement of the nutritional importance of cookies for children and other consumers within other age brackets.

3.2. Mineral Value Analysis

The mean values of the mineral of the formulated cookies, date palm fruit powder, and bean milk are represented in **Table 4**.

The results revealed a significant increase ($p < 0.05$) in the calcium, magnesium, zinc, and iron contents in PDBM compared to others cookie samples. It could be concluded that the addition of date powder improved the mineral quality of cookies. This corroborates Ghnimi *et al.* [38] who demonstrated that the replacement of sucrose with date paste in bread and cookies improves their nutritional quality by increasing levels of minerals. Iron is the most abundant mineral in bean milk (39.95 ± 3.00) mg/100g, followed by zinc (13.65 ± 1.61) mg/100g, magnesium (0.07 ± 0.05) mg/100g, and calcium (0.05 ± 0.02) mg/100g is the least. These results agreed with those reported by Habib and Ibrahim [47] where Fe was established at the highest levels in date pits. Therefore, the consumption of PDBM cookies could partially serve as a means of meeting the daily iron requirements of children and adults.

3.3. Physical Color of the Formulated Cookies

Table 5 represents the color variables of the formulated cookies which is an important attribute for the acceptability of many foods.

Generally, there were significant differences between formulas. L value was significantly lower for PDBM and PSBM compared to control, which shows that the presence of date powder and bean milk led to a significant increase in the darkness of biscuits. The difference in redness (a*) was also statistically significant. An increase in redness was observed in the PDBM sample, this could be due to the substitution of the sugar by the dates as suggested by Shazia *et al.* [48] and Alsenaien *et al.* [49]. Moreover, the color of the date powder was brown and may have been a contributory factor.

3.4. Sensory Quality Evaluation of Cookies

The sensory evaluation results of the formulated potato cookies are presented in **Figure 5**. They show that for the panelists, cookies made by replacing sugar with dates and eggs with bean milk (PDBM and PSBM respectively) had the highest rating for saltiness (2.3 and 2.6), acidity (1.2 and 1.33), bitterness (2.13 and 2.21). There was no significant difference between PDBM and PSBM for the brittle, fat, fondant, and granular attributes. On the inverse, the control had a higher rating

Table 4. Mean values for mineral content of the different formulated cookies, date palm fruit powder and bean milk.

Products	Calcium (mg/100g)	Magnesium (mg/100g)	Zinc (mg/100g)	Iron (mg/100g)
PDBM	0.05 ± 0.02^{ab}	0.07 ± 0.05^{a}	13.65 ± 1.61^{c}	39.95 ± 3.00^{d}
PSBM	0.03 ± 0.01^{a}	0.06 ± 0.01^{a}	9.80 ± 2.60^{b}	35.32 ± 0.19^{bc}
Control	0.02 ± 0.01^{a}	0.04 ± 0.01^{a}	8.80 ± 2.65^{b}	32.32 ± 0.19^{b}
Dates flour	0.05 ± 0.01^{a}	0.07 ± 0.01^{a}	5.63 ± 2.93^{a}	20.84 ± 1.45^{a}
Bean milk	33.00 ± 1.61^{a}	146.00 ± 7.00^{a}	3.72 ± 0.51^{a}	12.82 ± 1.51^{a}

Values are means ± SD (standard deviation) of triplicate determinations. Different superscript letters within the same column indicate statistical significance ($p < 0.05$).

Table 5. Mean values for color variation (L*, a* and b* values) of the different formulated cookies.

Products	Physical color		
	L*	a*	b*
PDBM	29.07 ± 0.86^{a}	6.73 ± 2.54^{b}	14.10 ± 2.63^{c}
PSBM	29.00 ± 1.85^{a}	4.67 ± 0.90^{a}	8.67 ± 1.67^{b}
Control	31.17 ± 0.05^{b}	4.50 ± 1.76^{a}	6.17 ± 0.86^{a}

Values are means ± SD (standard deviation) of triplicate determinations. Different superscript letters within the same column indicate statistical significance ($p < 0.05$).

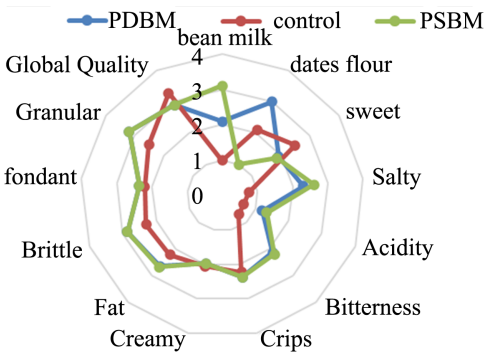

Figure 5. Sensory evaluation of the formulated cookies.

of sweetness compared to PDBM and PSBM. Crispness is the noise and strength when a cookie breaks or cracks when chewed on the first and second [50]. The sensory evaluation showed that the crispiness and the creaminess of the different cookies are not significant. Fieben *et al.* [51] reported that, the crispiness of the cookies decreased as bean flour was added. The control was highly acceptable to panelists compared to PDBM and PSBM. The overall acceptability obtained for the control cookies was 3.27, while that for PDBM and PSBM was 2.9. Hence, the addition of date palm pulp and bean milk in cookies formulation affects their quality properties.

4. Conclusion

The work investigated the substitution of both eggs and sugar with bean milk and date palm fruit in cookie production for improving their nutritional values. The bean milk and palm fruit date incorporated in cookies can be used as an alternative source to meet the mineral, protein, and glucose requirements. The outcome of the research showed an increase in protein, carbohydrate, and fat contents of those cookies. The proximate composition of the samples (PDBM and PSBM) increased with the incorporation of date palm pulp. The mean values of the mineral contents of the formulated cookies were significantly increased ($p < 0.05$) in the calcium, magnesium, zinc, and iron contents in PDBM compared to other cookie samples, therefore, the addition of date powder improved the mineral quality of the cookies. The physical properties of cookies produced from dates as a substitute for sugar and bean milk for eggs compared to the control decreased in redness and lightness but increased in yellowness. For the organoleptic characteristics, the PDBM and PSBM were rated overall best in saltiness, acidity, crispiness, creaminess, and bitterness. Overall acceptability scores of cookies revealed that substitution of sugar with date powder led to developing acceptable cookies. This shows that the fortification of potato flour with the fruit of date palm powder is a welcome development for the improvement of the nutritional importance of cookies for children and other consumers within other age brackets. Further work can be undertaken for rheology assessment purposes.

Acknowledgements

We got financial support from the Pan African Bean Research Alliance through the Alliance of Biodiversity International and the International Center for Tropical got financial support from Global Affairs Canada and technical support from the Institute of Agricultural Research for Development IRAD-Nkolbisson, Yaoundé-Cameroon, for carrying out this research work.

Author Contributions

A. M. and Z. Z. B. were the principal investigators of the study; thus, they have been involved in data collection, analysis, write-up, organization, and overall coordination. N. A., M. J. E. G. and N. E. B. contributed a lot during the research implementation, data collection, and analysis as well as in the entire manuscript preparation. All authors contributed to the article and approved the submitted version.

Conflicts of Interest

The authors declare that they do not have any conflict of interest.

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