SENSORY, PROXIMATE AND MINERAL COMPOSITION OF SOYMILK MADE FROM INTERMEDIATE SOY PRODUCT

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Cite this article:

Okoronkwo E.N., Nnam R.E., Adindu P.U., Eke L.N. (2022), Sensory, Proximate and Mineral Composition of Soymilk Made from Intermediate Soy Product. African Journal of Agriculture and Food Science 5(3), 90-101. DOI: 10.52589/AJAFS-WZLW0GGH

Manuscript History

Received: 11 Sept 2022

Accepted: 12 Oct 2022

Published: 9 Nov 2022

ABSTRACT: *This study was an attempt to produce soymilk from an intermediate Soy Product (ISP) to overcome the challenges of the traditional wet milling procedure. Seeds of Soybean (Glycine max) were dry-milled into soybean flour and constituted into soymilk by steeping the milled soybean flour sample into three different periods of SB_1, SB_2 and SB_3 for 1hour, 3hour and 6hours respectively at ambient temperature. The steeped intermediate soy product was then finally processed into soymilk by filtering through a muslin cloth and each filtrate pasteurised at 70^0c for 30 minutes. The resulting soymilk from this process was then subjected to sensory, proximate and mineral analysis. A soymilk produced using the traditional (wet-milling) method, TPS and a commercial soymilk CBS was used as standard control. The mean values from the analysis were subjected to analysis of variance (ANOVA) at 5% level of significance using SPSS 17.0 for Windows. Significance was established at 95% confidence limit and mean were separated using Duncan test. Considering the organoleptic properties of the samples, sample CBS (commercial control sample) showed a significant difference from the rest of the laboratory samples in all the parameters evaluated (at $P<0.05$). However, samples SB_1, SB_2, SB_3 and TPS were not significantly different from one another regardless of the processing methods and conditions. The proximate analysis from the soymilk samples showed that the sample steeped for 3hours (SB_2) and sample TPS were significantly not different and had the highest values in protein (3.05%), fat (4.05%) and ash (0.50%) than all the other samples at ($P<0.05$); whereas the sample soaked for 6hours (SB_3) was significantly higher in moisture content (84.45%) and Fibre (0.21%) and CBS was significantly higher in carbohydrate (15.67%). The mineral analysis of the soymilk also reviewed that the sample soaked for 3hours (SB_2) was significantly higher in calcium (44.45Mg/100g), magnesium (48.86Mg/100g) and iron (1.11Mg/100g), whereas the sample soaked for 1hour (SB_1) was significantly higher in zinc and copper (6.54 and 0.24Mg/100g) respectively. This work, therefore, reveals that soymilk of acceptable organoleptic, proximate and mineral qualities can be obtained using the method of an intermediate soy product (ISP).*

KEYWORDS: Soymilk, Dry milling, Intermediate soy product, Proximate, Sensory attributes and Mineral content.

INTRODUCTION

The diets of people in many developing countries comprise mainly of starchy roots, cereals, and few legumes because animal sources of protein, such as milk, meat and eggs needed to complement the starchy diets, are expensive and at times, out of reach for low-income families (Kolapo and Oladimeji, 2008). This has led to the search for cheap, available and affordable but nutritious alternatives to animal sources of protein.

Grain legumes serve as a cheap source of proteins to a large proportion of the population in poor countries of the tropics. As noted by Mbajiuka *et al.,* (2014), several legumes-based milk and milk products have been developed in attempts to extend the supply of milk-like products especially in areas where milk is in short supply. Gesinde *et al.,* (2008) further observed that since legumes are important sources of relatively inexpensive protein, introduction of imitation milk products from legumes will contribute to the alleviation of protein malnutrition. One of the most popular legume-based milk products in Nigeria is soymilk (Mbajiuka *et al.,* 2014).

Soymilk is a high–quality and healthy satisfying legume-based milk of smooth creamy texture with an off-white emulsion-like suspension produced from the water extract of soybeans that can be used as a suitable alternate of dairy milk (Hajirostamloo 2009; Asuquo and Antai 2017; Mbajiuka *et al.*, 2014; Ciabotti *et al.*, 2006). It is an important food drink because of its high nutritional value, comparatively low cost as well as its components that serve people that are lactose intolerant (Ishiwu *et al.,* 2014). Soymilk is a rich source of water-soluble protein, essential amino acids, lipid, minerals, vitamins (especially A and B), vegetable oil and carbohydrate (Udeozor and Awonorin 2014; Asuquo, 2017; Adebayo-Tayo *et al.,* 2009**)**. Babalola and Fajoye (2021) observed that compared with cow milk, soymilk has lower fat content and contains no cholesterol.

Traditionally, soymilk is produced by wet-milling the sorted soybeans before further processing of the soybean into soymilk. This wet milling introduces a lot of hygienic and safety concerns. Umeoduagu *et al.,* (2016) and Agboke *et al.,* (2021) observed that the locally produced soymilk does not undergo detailed processes and are produced, sold and consumed in an unhealthy or unhygienic environment thereby making the soymilk susceptible to contamination by pathogenic and other spoilage organisms. Therefore, the need to process, produce and consume soy milk in its best hygienic form cannot be overemphasized which necessitates this research. Therefore, this work seeks to produce soymilk by adopting the method of an intermediate soy product (ISP) through a dry milling process.

METHODOLOGY

Processing of Soybean Grains into an Intermediate Soy Product (ISP)

Healthy grains of soybean (*Glycine-max*) were bought from Eke Market, Afikpo in Afikpo North Local Government of Ebonyi State. The grains were sorted, washed with portable water, and then steeped for 18 hours with 5 times their equal weight of water with intermittent change of water (Hajirostamloo, 2009); the steeped soybeans were drained, rinsed and parboiled for 20 minutes.

Article DOI: 10.52589/AJAFS-WZLW0GGH
DOI URL: https://doi.org/10.52589/AJAFS-WZLW0GGH

The parboiled soybeans were divided into two portions in the ratio of 1:3. The larger portion was subjected to oven-drying in a cabinet dryer at 65°C (Abubakar *et al.,* 2018). The drying continued until the grains became friable such that the hulls could easily come off. The dried grains were then taken to a dry milling unit for dehulling and subsequent milling into powder using a disc mill. The powdered soybean product was then sieved to remove coarse particles using a 100-mesh standard sieve. The resulting powered material was divided into three equal portions and packaged in a well labelled air tight polymer sachet, for use as an intermediate soy product (ISP).

Production of Soymilk from the Intermediate Soy Product

Soymilk was obtained from the intermediate soy product by steeping each portion of the intermediate soy product with portable water in a big glass jar, stirred and left to rehydrate at room temperature. in the ratio of 1:10. The rehydration was done in such a way that one portion of the ISP was mixed with 10 equal portions of portable water (Rehman et al. 2007). Three distinct steeping periods were used viz: 1hour, 3hours and 6hours. Each steeped sample was then filtered using double layered muslin cloth and the milky extract collected directly into a stainless-steel pot. The collected milky extract was then pasteurised at 72℃ for 15 minutes and cooled at room temperature (Udeozor and Awonorin, 2014), before bottling in a labelled pre-sterilized pet bottle. The soymilk prepared was refrigerated for further analysis.

Production of Soymilk using the Traditional Method

The second portion of the steeped parboiled soybean was processed into a soymilk beverage using the traditional method as described by Momoh *et al.,* (2011). The steeped parboiled soybean samples were rinsed and agitated in portable water to separate the hulls and then wet milled into slurry using a disc mill. The slurry was mixed with 5 portions of its weight in portable water and then filtered through a double folded muslin cloth to obtain the milky extract. The milky extract was pasteurized at 72^{o}c for 15 minutes with constant stirring. The pasteurized soy milk was allowed to cool at room temperature, packaged, labelled and refrigerated for further analysis.

Sensory Evaluation of Soymilk Samples

The four soymilk samples obtained from the different processing methods and a commercial soymilk were subjected to sensory evaluation using a 20-man sensory panellist. The soymilk samples were evaluated for their organoleptic acceptance in terms of their appearance, colour, consistency, aroma, taste and overall acceptability. A 9-point hedonic scale was used for their sensory parameters, whereby: 9= Extremely liked, 8= Mostly liked, 7= Moderately liked, 6= Liked, 5= Neither like nor dislike, 4= Dislike, 3= Moderately dislike, 2= Mostly dislike, 1= Extremely disliked.

Proximate Analysis

For the proximate analysis of the five samples, the food procedure analysis as described by Association of Official Analytical Chemists (AOAC) (2005) was used. The parameters determined include moisture content, crude protein, fibre, ash, fat and carbohydrate.

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Mineral Analysis

For the mineral analysis of the five samples, the food procedure analysis as described by Association of Official Analytical Chemists (AOAC) (2010) was used. The parameters determined included Calcium (Ca^{2+}), Magnesium (Mg^{2+}), Zinc (Zn^{2+}), Iron (Fe^{2+}), and Copper (Cu^{2+}).

Statistical Analysis:

Data generated were statistically analysed using the Analysis of Variance. Mean values were subjected to one-way Analysis of Variance (ANOVA) at 5% level of significance using SPSS 17.0 for Windows. Means were separated using Duncan's multiple range tests.

RESULTS AND DISCUSSION

RESULTS

Table 1: Mean Sensory scores of Soymilk sample from Intermediate Soymilk Base

Sample	Appearance	Colour	Consistency	Aroma	Taste	G A
SB_1	$5.87^b±1.25$	$6.07^b±1.22$	$6.33^b±1.59$	$6.20^b±1.61$	$5.87^b±1.96$	$5.93^b±1.75$
SB_2	$6.20^b±1.32$	$6.23^b±1.30$	$6.83^b±1.72$	$5.40^a±0.91$	$5.87^b±1.41$	$6.89^a±1.33$
SB_3	$5.73^b±1.71$	$6.13^b±1.36$	$5.40^b±1.45$	$6.20^b±1.13$	$6.00^b±1.57$	$6.00^b±1.65$
CBS	$7.60^a±1.06$	$7.73^a±1.39$	$7.73^a±1.33$	$7.93^a±1.03$	$8.47^a±0.83$	$8.13^a±1.06$
TPS	$6.50^b±0.05$	$6.50^b±0.01$	$7.10^b±0.05$	$6.40^b±0.08$	$6.90^b±0.01$	$6.70^b±0.05$

Each value represents the mean of triplicate determinations. Values are expressed as mean ± SD. Means with the same superscript on the same column are significantly not different at ($p>0.05$)

KEY: G A. = General Acceptability

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Table 2: **Mean proximate composition of soymilk samples produced from intermediate soymilk base.**

Samples	Moisture Content (%)	Protein (%)	Fat (%)	Ash (%)	Fibre (%)	Carbohydrate (%)
SB_1	84.00^{ab}±1.41	2.31^{b}±0.00	2.05^{b}±0.06	5.02^{b}±0.02	0.11^{d}±0.11	11.33^{b}±1.30
SB_2	80.75^{b}±1.06	3.05^{a}±0.07	4.05^{a}±0.07	10.50^{a}±0.71	0.16^{c}±0.01	11.49^{d}±0.78
SB_3	84.45^{a}±0.78	2.05^{c}±0.07	2.04^{b}±0.06	5.05^{b}±0.07	0.21^{b}±0.01	11.10^{b}±0.71
CBS	76.00^{c}±1.41	1.11^{d}±0.01	2.05^{b}±0.06	5.05^{b}±0.06	0.16^{c}±0.01	19.63^{a}±0.14
TPS	82.01^{ab}±1.01	3.12^{a}±0.01	4.21^{a}±0.04	4.02^{b}±0.02	1.01^{a}±0.06	9.64^{c}±0.03

Values are expressed as mean ±SD. Means with the same superscript on the same column are significantly not different at P>0.05.

Table 3: Mean mineral composition of soymilk samples produced from intermediate soymilk base.

Sample	Calcium (mg/100g)	Magnesium (mg/100g)	Zinc (mg/100g)	Iron (mg/100g)	Copper (mg/100g)
SB_1	41.04^{b}±0.36	43.03^{c}±0.66	6.54^{a}±0.01	1.08^{ab}±0.01	0.24^{a}±0.01
SB_2	44.57^{a}±0.62	48.86^{a}±0.31	2.14^{e}±0.02	1.11^{a}±0.02	0.17^{b}±0.01
SB_3	38.67^{b}±0.75	45.30^{b}±0.43	5.26^{c}±0.05	1.05^{b}±0.02	0.12^{c}±0.01
CBS	31.03^{c}±1.37	24.61^{e}±0.41	5.49^{b}±0.14	0.72^{c}±0.02	0.09^{d}±0.01
TPS	36.56^{b}±0.05	39.23^{d}±0.01	4.71^{d}±0.05	1.02^{b}±0.08	0.11^{c}±0.01

Each value represents the mean of triplicate determinations. Values are expressed as mean ±SD. Means with the same superscript on the same column are significantly not different at P > 0.05.

KEY: SB_1: Soymilk sample from intermediate soymilk base steeped for 1 hour

SB_2: Soymilk sample from intermediate soymilk base steeped for 3 hours

SB_3: Soymilk sample from intermediate soymilk base steeped for 6 hours

TPS: Traditionally processed soymilk; **CB:** Commercial soymilk samples

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DISCUSSION

Sensory

Table 1 shows the organoleptic parameters evaluated for the soymilk prepared from intermediate soy product (ISP), traditional wet milling method and commercially processed soymilk. The parameters evaluated included appearance, colour, consistency, aroma, taste and general acceptability. From Table 1, CBS was significantly different from the rest of the laboratory samples in all the parameters evaluated (at P<0.05). However, samples SB_1, SB_2, SB_3 and TPS were not significantly different from one another regardless of the processing methods and conditions. The variance of CBS from the other samples can be attributed to the additives and flavours contained therein, being a commercial product. From the result, it could be inferred that processing method and rehydration time does not affect the sensory attributes of soymilk drink. This result tallies with the report of Enwere (1998) who reported that the appearance, colour, consistency, aroma and taste of soymilk samples steeped for 1hr and 9 hrs were not affected by the steeping periods. Also, Abuajah *et al.,* (2013) observed that the processing method of soymilk does not affect the sensory properties of the milk except in appearance. However, Shashego (2019) and Syamsuri and Lestari (2021) reported significant differences in certain organoleptic properties of steeped and processed soymilk respectively. While Shashego (2019) reported the effect of soaking time and temperature on the sensory properties of soymilk, Syamsuri and Lestari (2021) detailed the effect of the processing method on the organoleptic attributes of soymilk. In the result obtained by Shashego (2019), a significant difference in colour, odor, and general acceptance when the soymilk samples were soaked in 8, 12 and 16 hours was observed while no significant difference in flavour for the three steeping period was observed. There was significant difference in all the parameters evaluated by Syamsuri and Lestari (2021) which include colour, flavour, aroma, viscosity and taste. However, the steeping time was for a longer period.

Proximate

From Table 2 above, it was observed that for the moisture content, the values ranged from 76.00±1.41 to 84.45±0.78 with CBS having the least and sample SB_3 having the highest. There was no significant difference between samples SB2 and TPS but there was a slight significant difference (at P<0.05) between samples SB_2 and TPS and SB_3. However, all the samples were significantly different (at P<0.05) from sample CBS. The variation could be as a result of the high ratio of water used in mixing the laboratory samples. The values correspond to the observation of Enwere (1998) who stated that about 80-92% of soymilk is water, although it is slightly lower than the results obtained and reported by Madukwe and Eme (2012) 86.79-89.84%, Babalola and Fajoye (2021) 87.2–94.01% moisture content for soymilk cooked under different temperature and cooking time and Adelekan *et al.*, (2013) 83.98-91.67%. However, Asuquo and Antai (2017) reported a lower moisture content range of 26-36.50% for soymilk drinks and Oladele and Ofure (2020) reported 77.90-79.00% for the same.

The protein content ranged from 1.11±0.01 to 3.05±0.07 with sample CBS (the commercial control) having the least value while TPS had the highest value. The 3 samples (SB1, SB3 and CBS) differ significantly from samples TPS and SB_2 (at P< 0.05). Plernchai (2010) reported that the protein content of soymilk was 2.8% while Shikder (2003) gave the protein content of soymilk to be 3.08%. Babalola and Fajoye (2021), Adelekan *et al.*, (2013), and Oladele and Ofure (2020) reported 3.39%, 3.90% and 3.07% respectively. Hence from the result shown

Article DOI: 10.52589/AJAFS-WZLW0GGH
DOI URL: https://doi.org/10.52589/AJAFS-WZLW0GGH

above, the crude protein found in samples TPS and SB_2 fall within the range. However, the result was lower than that obtained by Asuquo and Antai (2017) who reported a range between 10.68-19.08%. The low value found in sample SB_3 was because fermentation has already begun. Again, it may be as a result of the heating process which denatured some of the protein molecules thereby reducing the protein content. The implication of these values for the protein content is that samples TPS and SB_2 are ideal in the management of protein deficiency cases such as Kwashiorkor.

The fat content ranged from 2.04±0.06 to 4.71±0.04. The least value was found in sample SB_3 which had 2.04±0.06 while TPS had the highest value (4.05±0.07). There was no significant difference (at $P>0.05$) between samples SB_1, SB_3 and the control, CB. However, there were significant differences at $P<0.05$ between samples TPS and SB_2 on one hand and samples SB_1, SB_3 and CBS on the other hand. These values obtained were comparable to those obtained by Babajide (2005) who stated that soymilk contains 2.12% fat. It also agrees with the result of Babalola and Fajoye (2020), Adelekan *et al.*, (2013), Asuquo and Antai (2017), Oladele and Ofure (2020) and Hajirostamloo (2009) who reported 2.4%, 2.30%, 2.30%, 3.00% and 4.67% respectively. The variation in the values could be attributed to the fact that heat helps in extraction of oil and therefore the amount of heat applied could affect the fat composition. The implication of these values is that the samples produced from this intermediate soy product (ISP) are very nutritious food products because they are rich in fat and protein.

Also, for the ash content, the values ranged from $4.02^b±0.02$ for TPS, 5.01±0.02 for SB_1, $5.05^c±0.07$ for SB_3, $5.05^c±0.06$for CBS, to $10.50^a±0.71$for SB_2. There was a significant difference (at $P<0.05$) between sample SB_2 and the rest of the samples while there was no significant difference between samples SB_1, SB_3, CBS and TPS. Sample TPS was observed to also have a significant difference (at $P<0.05$) between SB_2 on one hand and samples SB_1, SB_3 and CBS. These values obtained are comparable to the ones obtained by Orhevba and Bankole (2019) who stated that soymilk contains 1.59-5.08% ash content. The samples TPS, SB_1, SB_3 and CBS fall within the range while samples SB_2 had higher value. These high values show that the samples had dense minerals in the soymilk samples especially in sample SB2 which had twice the values of other samples.

Values for the fibre content ranged from 0.11±0.01 to 1.01±0.06. Sample SB_1 had the least value while TPS had the highest value. Sample SB2 and sample CBS (the control) were not significantly different (at $P>0.05$) from each other but they were significantly different (at $P<0.05$) from other samples (SB1 and SB3). The crude fibre of soymilk is seen to be a trace. Studies by Enwere (1998) shows that soymilk crude fibre is in minute quantities (0.10 to 0.31%) and the result obtained from this research falls within the range. This also agrees with the result obtained by Oladele and Ofure (2020). However, Babalola and Fajoye (2021), Asuquo and Antai (2017) and Madukwe and Eme (2012) reported 1.56%, 1.60% and 1.04% respectively. These results either completely agree or slightly above the result obtained in this research for sample TPS. The implication of these values implies that soymilk is a healthy food with little or no junk content.

It was also observed that for the carbohydrate content, the result ranged from 1.49±0.78 to 15.63±0.14 with SB_2 having the least value while CBS had the highest value. It was also observed that there was no significant difference between SB_1 and SB_3 (at $P>0.05$) but there was significant difference (at $P<0.05$) between these samples SB_2, TPS and CBS. These values except for CBS are within the range reported by Babalola and Fajayo (2021) which is between

Article DOI: 10.52589/AJAFS-WZLW0GGH
DOI URL: https://doi.org/10.52589/AJAFS-WZLW0GGH

African Journal of Agriculture and Food Science
ISSN: 2689-5331
Volume 5, Issue 3, 2022 (pp. 90-101)

0.07- 8.47% at different cooking times and temperatures. Udeozor (2012) reported 2.7% for unsweetened soymilk while Adelekan *et al.*, (2013) reported a range between 9.37-15.87%. The high carbohydrate content of sample CBS could be as a result of the sweetening content compared to the unsweetened laboratory samples obtained in this work.

Mineral Analysis

Mineral elements are the most important constituent of foods which play many roles in chemical and biochemical body processes (Okpara et al., 2015). Soy milk as a food drink contains both micro and macro nutrients and some of them were evaluated in this work. Table 3 shows the mineral composition of all the samples analysed. The minerals evaluated included calcium (Ca^{2+}), magnesium (Mg^{2+}), zinc (Zn^{2+}), iron (Fe^{2+}) and copper (Cu^{2+}).

Calcium is one of the most important minerals and the most abundant mineral in the body that the human body needs for diverse cellular functions, such as vascular contraction, vasodilation, muscle functions, nerve transmission, intracellular signaling, gene expression, bone metabolism, proliferation, secretion, neural excitation, fertilisation and hormonal secretion (Cormick and Belizán, 2019; Beto, 2015; Tandogan and Ulusu, 2005). It is also an essential nutrient needed for the healthy growth of children. From the result obtained above, it was observed that for the calcium content, the values ranged from 31.03±1.37 to 44.57±0.62. Sample CBS had the least value (31.03±1.37) while sample SB_2 recorded the highest value. Between samples SB_1, SB_3 and TPS, there was no significant difference at ($P<0.05$) while there was a significant difference at ($P<0.05$) between sample SB_2 and the remaining samples. Studies by USDA (2005) show that soymilk has a minimum value of 25mg/100g when considering the calcium content. The results obtained in this research fall within the value stipulated above. It also agrees with the result obtained by Okpara *et al.* (2021) who reported a range of 40.02- 43.85 mg/100g, and Udeozor (2012) who reported the calcium content of unfortified soy milk to be 44.5±0.3368. The variation in the result obtained in this work could be attributed to the processing methods and conditions used.

The magnesium content of the soymilk sample ranged from 24.61±0.41 for CBS to 48.86±0.31 (mg/100g) for SB_2. There was a significant difference among the entire five samples analysed at ($P<0.05$). These variations could be attributed to the processing method, technology employed in the production and the rehydration time for the soymilk produced from ISP. Apart from sample CBS, the values obtained in this work is higher than the 32mg/100g reported by Udeozor (2012), 14-21 reported by Asuquo and Antai (2017), 4.05-17.97 (mg/mL) obtained by Okpara et al. 2021. Similarly, Nwoke *et al.*, (2015) reported 53.76 to 54.83. The high value recorded for sample SB_2 could be as a result of the steeping time. The value obtained in this result and others cited could be ascribed to the processing steps like sieving to removing hulls, among others (Nwoke *et al.*, 2015). However, when adequately consumed, the soymilk produced from this result sample SB_2 can provide the body with magnesium. Thus, sample SB_2 can be used as dietary supplement in the diets of people in rural areas. People that are intolerant with lactose in protein synthesis, blood glucose control, blood pressure regulation, structure development, muscle contraction and normal heart rhythm as magnesium has been reported to serve as cofactors for 300 enzyme systems that perform diverse bronchial functions (Outhoff, 2018; Nielsen, 2018; Tamboli *et al.*, 2011; Nwoke *et al.*, 2015).

From the result obtained, the zinc values ranged from 2.14±0.02 to 6.54±0.01. Sample SB_2 having 2.14±0.02 had the least value while SB_1 having 6.54±0.01 had the highest value

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recorded. The values are higher than the value reported by USDA (2005) which gave the Zinc content to be 0.54mg. There were significant differences (P<0.05) among the samples. The implementation of the high zinc value is that when consumed, these lab samples of soymilk have the potential of improving the immunity in consumers as trace elements like Zinc are essential in the maturation, activation and functions of host defence mechanism and are integral part of enzymatic antioxidants (Soetan *et al.,* 2010).

Iron is one of the trace elements, though required in small quantities that play important roles in the catalytic activities of major antioxidant enzymes (Soetan *et al.,* 2010). From the result, the Iron values ranged from 0.72 ± 0.002^c to 1.11 ± 0.02. Sample CBS had 0.72 ± 0.02^c as the least value while SB_2 having 1.11 ± 0.02^b had the highest value recorded. The value obtained is closed to the values reported by Enwere (1998) who opined that plain soymilk contains 1.44mg/100g. Although slight differences were found between sample SB1, sample SB2 and SB3. The value obtained from the sample is higher than the one reported by USDA (2005) which is 0.06mg. The sample with the highest value will be nutritional beneficial to infant and growing children as well as pregnant mothers (Arinola *et al.,* 2008c); prevent impaired intellectual development, lead poisoning and anaemia in both children and adults when consumed adequately (Nwoke et al., 2015).

The copper content ranged from 0.09±0.01 for sample CBS to 0.24±0.11 for sample SB_1. The value agrees with the result given by Udeozor (2012) who reported that copper content is 0.17mg. There were significant differences (P<0.05) among the sample. The implication of the high copper value as an essential trace mineral required by body is that it could be needed for energy production, absorption of Iron, and in connective tissue production (Arinola et al., 2008c; Soetan *et al.,* 2010).

CONCLUSION

Soybean were processed into an intermediate soy product from which soymilk was made by steeping in portable water at three different periods (1hour, 3hours and 6hours). The effect of steeping time on the sensory, proximate and mineral composition of the soymilk samples were analysed and compared with two other samples, namely: traditionally processed soy milk and commercial soymilk. From the sensory evaluation, it was observed that the steeping time (1hour, 3hours and 6hours) of the soymilk made from ISP for samples SB_1, SB_2 and SB_3 respectively had no effect on the organoleptic properties of the products evaluated except for sample CBS. Nutritionally, the proximate analysis of the soymilk samples shown that the soymilk made from the ISP and steeped for 3 hours was better in all the parameters evaluated except for the carbohydrate which also falls within the range recommended for carbohydrate in soymilk at (p<0.05). On the mineral composition, sample SB2 (steeped for 3hrs) was significantly higher in the calcium, magnesium and iron content than the other sample at (p<0.05) while sample SB1 (steeped for 1hr) was significantly higher in the zinc and copper content than the other sample at (p<0.05). It can therefore be concluded that a soymilk of acceptable sensory, proximate and mineral qualities can be produced by using the method of an intermediate soy product (ISP).

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DOI URL: https://doi.org/10.52589/AJAFS-WZLW0GGH

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