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Physico-Chemical Characteristics of *Awara* Produced from Soybeans Using different Coagulant

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Abstract: ***Five different types of coagulants from (soursop, passion fruit, baobab pulp, pineapple and tamarind pulp) were used to assess the effect of these coagulants on the vitamins, minerals, amino acids, of soycheese. There was significant difference (p<0.05) in the Vitamins B12 and C contents of the soycheese produced from different coagulants. Vitamins B1, A, B6, B12, B3 and C ranged from 0.88-1.35mg/100g, 0.10-0.90 mg/100g, 0.44-13.22 mg/100g, 0.02-0.23 mg/100g, 2.23-12.27 mg/100g and 0.61-33.13 mg/100g respectively. The result revealed high contents of mineral elements except for iodine that showed low mineral content. Significant difference (p<0.05) existed between the soycheese in their mineral contents. The iron, zinc, calcium, phosphorus, magnesium and iodine ranged from 15.07-16.63mg/100g, 5.02-6.97mg/100g, 272.75-301.61mg/100g, 712.29-1023.54mg/100g, 291.56-303.96mg/100g and 0.00-0.92mg/100g respectively. The amino acid contents ranged from 1.82-1.92 percentage g/100g, 2.86-3.25 percentage g/100g, 1.69-1.90 percentage g/100g, 0.93-1.03 percentage g/100g, 5.62-5.67 and 0.50-2.50 in alanine, arginine, Glycine, Histidine, lysine and proline respectively. The result showed no significant difference (p<0.05) in the in vitro protein digestibility of the various samples at both 1 and 6h. The result ranged from 80.75-87.45h and 83.45-89.78h at 1 and 6 h, respectively.***

Keywords: soycheese, soursop, passion fruit, baobab and pineapple

1. Introduction

Cheese (*Awara* or *Tofu* or soy paneer) is popularly consumed in Nigeria because of the various nutritional and medical attributes associated with soybeans product such as reduction of cardiovascular disease, osteoporosis, and cancer risks (Maijalo *et al.,* 2016). It is also known as soybean curd, *awara* in Northern parts of Nigeria, and *beske* in the Western parts of Nigeria. Locally, it is processed by first preparing soymilk and further precipitating the milk with a coagulant. Different cheap locally sourced coagulants have been used in processing Awara which includes the enzyme (*Calotropis procera)* leave water extract or acid based (lime juice, sulphate. In addition, vinegar, tamarind pulp, *Moringa oleifera* seed extract and citric acid (*blalemu)* are also used as coagulants (Belewu, 2001). Awara is low in calories, rich in essential amino acids, contains beneficial amounts of iron and has no saturated fat or cholesterol (Maijalo *et al.,* 2016). Soycheese is an excellent source of soy protein. Proteins are polypeptides which are formed as a result of condensation of amino-acids. Of the 20 amino-acids utilized in protein synthesis, only 10 can be synthesized in the human system (non-essential amino acids) while the other 10 must necessarily be derived from food products (essential amino acids) making the essential amino acids a very important component of human diet (Jaianming *et al*., 2013). Essential amino acids are isoleucine, leucine, lysine, methionine, phenyl alanine, threonine, tryptophan and valine (for adults) arginnine and histidine are added to list for infants. Soycheese (*tofu*) contains all of the above essential amino acids such as cysteine, tyrosine, alanine, aspartic acid, glutamic acid, glycine, proline and serine. Due to the fact that Soycheese (tofu) as a food product contains all of the essential amino acids, it is regarded as a rich source of high quality proteins (Sidar *et al*., 2011).

Cheese is a dairy product with high nutrition and usually made from cows, sheep and goat (Omotosho *et al.,* 2011). The nutrition in cheese is different according to type of milk (Jaianming *et al.*, 2013). However, high fat content in cheese can cause health problem to consumers. (Hwang *et al.*, 2009).

Soybean is used for making high protein food for children. It is widely used in the industrial production of different antibiotics (Belewu, 2001). Soybean builds up the soil fertility by fixing large amounts of atmospheric nitrogen through the root nodules, and also through leaf fall on the ground at maturity (Hou *et al.*, 1997). It can be used as fodder; forage can be made into hay, silage etc. Its forage and cake are excellent nutritive foods for livestock and poultry. Soybean being the richest, cheapest and easiest source of best quality proteins and fats and having a vast multiplicity of uses as food and industrial products is sometimes called a wonder crop (Jackson *et al.*, 2001).

This research was carried out to produce *awara* of acceptable nutritional quality from soybeans using four different coagulants

2. Materials and Methods

2.1 Source of Materials and Preparation

The soybean (*Glycine max*) was purchased from Northbank Market, Makurdi Benue State. Fruits (soursop, passion fruit, baobab, pineapple and tamarind) were purchased from fruit market, Makurdi Benue State and were taken to the department of Food Science and Technology, Federal University of Agriculture Makurdi. The raw materials were properly cleaned by removing extraneous matter prior to their subjection to different processing treatments.

2.2 Processing Methods

2.2.1 Preparation of coagulants

Soursop (*Annona muricata*), passion fruit (*Passiflora edulis*), baobab (*Adansonia digitata*), pineapple (Ananas comosus) and tamarind (*Tamarindus indica L.*) coagulants were prepare as shown below.

Soursop Fruit
↓
Peeling
↓
Pulping (handpicking of pulp)
↓
Blending with water (200g/400ml)
↓
Sieving
↓
Soursop coagulant

Figure 1: Flow Chart Showing the Production of Soursop Coagulant
Source: (Omotosho *et al*., 2011).

Passion Fruit
↓
Washing
↓
Peeling
↓
Pulping
↓
Removal of Seed
↓
Sieving
↓
Passion Fruit Coagulant

Figure 2: Flow chart for the production of passion fruit coagulant.
Source: (Omotosho *et al*., 2011 with modification)

Baobab Fruit
↓
Breaking of the Pod
↓
Removal of Seeds
↓
Pulping
↓
Sieving
↓
Baobab Coagulant

Figure 3: Flow chart for the production of baobab coagulant.
Source: (Augustine et al., 2014 with modification)

Pineapple Fruit
↓
Washing
↓
Peeling
↓
Cutting
↓
Juice Extraction
↓
Pineapple Coagulant

Figure 4: Flow chart for the production of pineapple coagulant
Source: (Augustine *et al*., 2014 with modification).

Tamarind Fruit
↓
Steeping in water 28g/2litres 6-8hrs)
↓
Scrubbing with hands
↓
Sieving
↓
Tamarind Coagulant

Figure 5: Flow chart for the production of tamarind coagulant.
Source: (Augustine *et al*., 2014 with modification)

2.3 Preparation of Soy Cheese

Soy cheese was prepared based on the formulation shown in the Table below.

Table 1: Formulation for Soycheese and Coagulants

Sample	Coagulant Quantity (ml)	Soymilk Quantity (ml)
A	30	3000
B	30	3000
C	30	3000
D	30	3000
E	30	3000

Key A= Soursop Coagulated Soycheese, B= Passion Fruit Coagulated Soycheese, C= Baobab Coagulated Soycheese, D= Pineapple coagulated Soycheese, E= Tamarind Coagulated soycheese

Soy cheese was prepared according to the method of Oboh and Omotosho (2012). Soybeans were washed and soaked in water for 6h. The water was removed and the soaked soybeans were wet milled to obtain the slurry. Soymilk or soy beverage was then extracted from the slurry using a sieve and lactose was added. The soymilk or soy beverage was transferred into a cooker where it was heated to about 80^0C with constant stirring which was held at the same temperature for about 5 minutes. Coagulant solutions (30 ml of soursop, passion fruit, baobab, pineapple and tamarind) were added in 3000 ml of soymilk each and were allowed to solidify forming curds. The curds were removed from heating and further compressed to remove whey to make firm curds. Afterwards the curds were cut into desirable shapes and further fried.

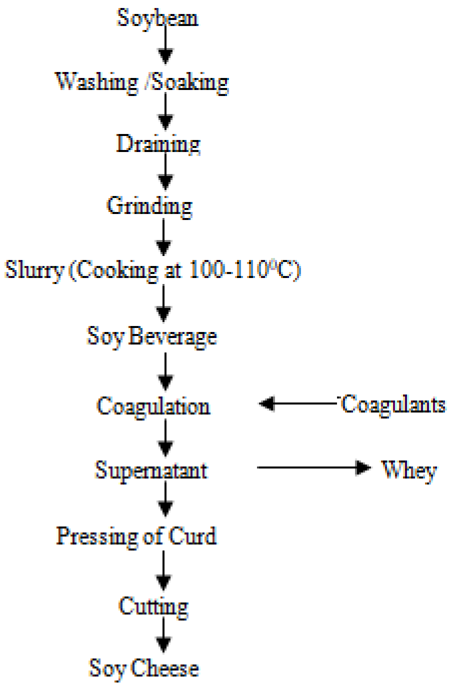

Figure 6: Flow chart showing the production of soycheese
Source: (Oboh and Omotosho 2012)

2.3 Vitamin Contents Determination of the awara samples

The *awara* samples produced were subjected to vitamin content determination, the ascorbic acid, thiamine, riboflavin, pyridoxine, folic acid and niacin were determined by High Performance Liquid Chromatography (HPLC) as described by (AOAC, 2012)

2.4 Mineral Contents Determination of the awara samples

The awara samples produced from soybeans using different coagulants were subjected to mineral content determination, the K was determined by Flame Photometry and phosphorus by Vanado-molybdate method as described by (AOAC, 2012). While Fe, Mg and Zn were determined by Absorption Spectrophotometer as described by (AOAC, 2012).

2.5 Determination of Dispensable and indispensable amino Acids of the *awara* samples

The amino acid of the awara samples was determined by using an automated amino acid analyzer (TVA AAAA: 230 dinkjing UAE, 2014), able to determine Siteen amino acids. Sample (0.5g) soy flour was pasted with 50ml 6N HCl by mortar pestle, filter and filtrate was hydrolyzed for 22-24 hours in a hydrolyzing apparatus. After hydrolyzing HCl was removed from filtrate with distill water for 3-4 times by evaporation in a water bath. After completing the evaporation, the stock solution was prepared and mark up to 25ml in a volumetric flask by using 0.1N HCl. This stock solution was used for the determination of amino acids as outlined by AOAC, (2012).

2.6 In-Vitro Protein Digestibility (IVPD) of the *awara* samples

The in-vitro Protein digestibility of the *awara* samples were determined using the method of (Nill, 1979). One milliliter of 11% Trypsin was introduced into 3 test tubes. Subsequently, 4 ml of phosphate buffer with pH 7.5 was added to each test-tube and 1 ml of 0.1 NHC1 was also added and allowed to stand to equilibrate, after which 1 ml of 1% sample was added to all the test tubes (labeled as digestibility at 1 and 6 hrs). The reaction in each of the test tube was stopped with 5 ml of neutralized formalin at 60 min and 6 hrs. The content of the test tubes were then filtered using filter paper. The filter papers were dried in an oven at 108°C for 3 h. The nitrogen of the undigested sample was determined by the Kjedahl method:

$$\% \textit{ in vitro } \textbf{protein digestibility} = \frac{CP1 - CP2}{CP1}$$

Where CP1 = Total protein of sample;
CP2 = Total protein after digestion with Trypsin.

3. Results and Discussion

Table 2: Effects of Different Coagulants on the Vitamins (mg/100g) Contents of Soycheese

	PARAMETER					
SAMPLES	B1	VIT. A	B6	B12	B3	VIT. C
A	$0.91^c±0.01$	$0.90^a±0.01$	$0.47^c±0.02$	$0.03^d±0.00$	$2.38^c±0.18$	$26.33^d±0.04$
B	$0.90^c±0.00$	$0.90^a±0.21$	$0.44^c±0.01$	$0.09^c±0.11$	$3.23^b±0.00$	$33.13^a±0.01$
C	$1.35^a±0.01$	$0.90^a±0.02$	$0.98^b±0.0$	$0.23^a±0.01$	$3.09^b±0.00$	$29.83^b±0.1$
D	$0.88^c±0.01$	$0.10^b±0.10$	$13.22^a±0.04$	$0.13^b±0.01$	$12.27^a±0.07$	$0.61^e±0.00$
E	$0.96^b±0.07$	$0.89^a±0.01$	$0.47^c±0.01$	$0.02^d±0.1$	$2.53^c±0.01$	$26.70^c±0.01$
LSD	**0.02**	**0.01**	**0.03**	**0.02**	**0.23**	**0.11**

Values are means ±S.D of triplicate determinations. Values on the same column with different superscripts are significantly different ($p < 0.05$)

KEY: A= Soursop Coagulated Soycheese, B= Passion Fruit Coagulated Soycheese, C= Baobab Coagulated Soycheese, D= Pineapple coagulated Soycheese, E= Tamarind Coagulated Soycheese

3.1 Effects of Different Coagulants on the Vitamins

The result showed that the baobab (1.35 mg/100g) coagulated soycheese was significantly (p<0.05) higher than soursop (0.91 mg/100g), passion fruit (0.90 mg/100g), pineapple (0.88 mg/100g) and tamarind (0.96 mg/100g) coagulated soy cheeses in their Vitamin B1 contents. In the vitamin B6 contents of the samples, the pineapple (13.22 mg/100g) coagulated soycheese was significantly (p<0.05) the highest. This was followed by samples A (0.47 mg/100g) and E (0.47 mg/100g) which are the soursop and tamarind coagulated soycheese having the same content of vitamin B6. Sample C had the vitamin B6 content of 0.98mg/100g while the lowest content was recorded in sample B (0.44

mg/100g) which is the soycheese produced from passion fruit. The baobab (0.23 mg/100g) coagulated soy cheese recorded the highest content of vitamin B12 and the lowest was in tamarind (0.02 mg/100g) coagulated soy cheese but there was no significant difference ($p<0.05$) between the tamarind (0.0.02 mg/100g) and the soursop (0.03 mg/100g) coagulated soy cheeses. The pineapple (12.27 mg/100g) processed soycheese had the highest content of vitamin B3 and it was significantly ($p<0.05$) different from other samples. This was followed by passion fruit (3.23 mg/100g) processed soycheese and the baobab (2.09mg/100g) processed soycheese recorded the lowest vitamin B3 content. Passion fruit coa;2gulated soycheese (33.13 mg/100g) recorded the highest content of vitamin C followed by baobab (29.83 mg/100g), tamarind (26.70 mg/100g), soursop (26.33 mg/100g) and then lowest content was in pineapple (0.61 mg/100g) coagulated soy cheese. There was significant difference ($p<0.05$) among the samples in their vitamin C content. Samples A (0.90 mg/100g), B (0.90 mg/100g) and C (0.90 mg/100g) which are the soursop, passion fruit and baobab coagulated soy cheese recorded the same but the highest contents of Vitamin A and therefore are not significantly different ($p<0.05$). This was followed by sample E (0.89 mg/100g) which is the tamarind coagulated soy cheese and the lowest was the sample D (0.10 mg/100g) which is the pineapple coagulated soycheese.

Table 3: Effects of Different Coagulants on the Mineral Content (mg/100g) of Soycheese

	PARAMETER					
Samples	IRON	ZINC	CALCIUM	PHOSPHORUS	MAGNESIUM	IODINE
A	$15.46^{d}\pm0.14$	$5.25^{c}\pm0.02$	$282.22^{c}\pm0.14$	$732.12^{c}\pm1.25$	$292.98^{c}\pm0.00$	$0.92^{a}\pm0.00$
B	$16.63^{b}\pm0.02$	$5.16^{c}\pm0.06$	$290.05^{b}\pm0.09$	$773.78^{b}\pm0.12$	$303.96^{a}\pm0.04$	$0.00^{c}\pm0.00$
C	$15.07^{e}\pm0.03$	$6.97^{a}\pm0.06$	$272.75^{e}\pm0.33$	$1023.54^{a}\pm0.50$	$299.06^{b}\pm0.08$	$0.04^{\mathbf{b}}\pm0.00$
D	$16.07^{a}\pm0.06$	$5.96^{b}\pm0.05$	$301.61^{a}\pm0.54$	$712.29^{d}\pm0.21$	$292.59^{c}\pm0.58$	$0.09^{b}\pm0.00$
E	$15.21^{c}\pm0.01$	$5.02^{d}\pm0.01$	$280.02^{d}\pm1.44$	$732.16^{c}\pm1.64$	$291.56^{c}\pm2.05$	$0.07^{b}\pm0.00$
LSD	**0.18**	**0.36**	**1.82**	**2.45**	**2.46**	**0.01**

Values are means ±S.D of triplicate determinations. Values on the same column with different superscripts are significantly different ($p < 0.05$)

KEY: A= Soursop Coagulated Soycheese, B= Passion Fruit Coagulated Soycheese, C= Baobab Coagulated Soycheese, D= Pineapple coagulated Soycheese, E= Tamarind Coagulated Soycheese

3.2 Effects of Different Coagulants on the Mineral Content

Table 3 presents the result of the mineral composition of soycheese produced from different coagulants. The passion fruit (16.63mg/100g) coagulated soycheese had the highest iron content. This was followed by the pineapple (16.07mg/100g) coagulated soycheese, then the soursop (15.46mg/100g) and tamarind (15.21mg/100g) coagulated products. The lowest iron content was recorded in the baobab (15.07mg/100g) coagulated soycheese. There was significant difference ($p<0.05$) in the iron content of samples. The zinc content of the baobab (6.97mg/100g) coagulated soycheese was significantly ($p<0.05$) higher than other coagulated soycheese. This was followed by pineapple (5.96mg/100g) coagulated soycheese then the soursop (5.25mg/100g) and passion fruit coagulated soycheese. The lowest zinc content was recorded in the tamarind (5.02mg/100g) coagulated soycheese. This could be attributed to the low (1.18mg/100g) zinc content of tamarind as reported by Ogungbenle (2015). There was no significant difference ($p<0.05$) between the soursop and the passion fruit coagulated soycheese in their zinc contents. The highest calcium content was recorded in the pineapple (301.61 mg/100g) coagulated soycheese and the lowest was in baobab (272.72 mg/100g) coagulated soycheese. Significant difference existed among the samples in their calcium content. Soursop processed soycheese had a calcium content of 282.22 mg/100g while passion fruit and tamarind coagulated soycheese had calcium contents of 290.05 mg/100g and 280.02 mg/100g respectively. The soycheese recorded high content of phosphorus in them. Meanwhile the highest value was recorded in the baobab (1023.54 mg/100g) coagulated soycheese, it was followed by the passion fruit (773.78 mg/100g), then the tamarind (732.16 mg/100g) and the soursop (732.12 mg/100g) coagulated soycheese. The lowest content was in the pineapple (712.29 mg/100g) coagulated soycheese. Between soursop and tamarind coagulated soycheese, there was no significant difference ($p<0.05$). Sena *et al.*, (1998) reported high phosphorus content (425 mg/100 g) of baobab. The products are also high in magnesium content. Passion fruit (303.96 mg/100g) coagulated soycheese was significantly ($p<0.05$) higher than the other samples in their magnesium content which was followed by the baobab (299.06 mg/100g) coagulated soycheese. Between soursop, pineapple and tamarind coagulated soycheese, there was no significant difference ($p<0.05$) in their phosphorus contents as they recorded the values of 299.98 mg/100g, 292.59 mg/100g and 291.56 mg/100g respectively. Tamarind coagulated soycheese also recorded the lowest magnesium content. Ogungbenle (2015) recorded low magnesium content (11.8 mg/100g) of tamarind. The products are generally low in iodine and the passion fruit processed soycheese recorded no value. But the lowest content was recorded in the baobab (0.04 mg/100g) while the highest was observed in the soursop (0.92 mg/100g) processed soycheese and was followed by the pineapple coagulated soycheese. The content of tamarind coagulated soycheese was 0.07 mg/100g. The results above are higher compare to the ones reported by Omotosho *et al.*, (2005), Yakubu and Amuzat (2012) and (Omotosho et al., 2005).

Table 4: Effects of Different Coagulants on the Amino Acid Profile of Soycheese (percentage g/100g)

Spl	Alanine	Arginine	Aspartic acid	Glutamic acid	Glycine	Histidine	Isoleucin	Leucine
A	1.83^{c}±0.00	3.09^{c}±0.00	4.34^{d}±0.01	6.68^{d}±0.01	1.70^{d}±0.01	0.93^{d}±0.01	2.02^{a}±0.00	3.25^{c}±0.05
B	1.93^{a}±0.00	3.09^{c}±0.00	4.97^{c}±0.02	6.96^{c}±0.04	1.74^{c}±0.01	1.00^{b}±0.00	2.03^{a}±0.02	3.25^{c}±0.05
C	1.93^{a}±0.00	3.25^{a}±0.03	6.40^{a}±0.01	7.91^{a}±0.03	1.90^{a}±0.02	1.03^{a}±0.12	1.51^{a}±0.71	3.37^{ab}±0.01
D	1.88^{b}±0.01	3.17^{b}±0.01	5.66^{b}±0.00	7.66^{b}±0.01	1.80^{b}±0.02	0.99^{b}±0.02	2.04^{a}±0.00	3.41^{a}±0.03
E	1.82^{c}±0.01	2.86^{d}±0.04	4.12^{e}±0.02	6.74^{d}±0.02	1.69^{d}±0.01	0.95^{c}±0.01	2.02^{a}±0.03	3.26^{bc}±0.05
LSD	0.02	0.03	0.03	0.08	0.03	0.01	0.82	0.11

Table 5: Effects of Different Coagulants on the Amino Acid Profile of soycheese [Percentage g/100g

Spl	Lysine	Methionine	Phenylalanine	Proline	Serine	Theronine	Valine	Tryptophan
A	5.65^{a}±0.03	0.93^{b}±0.00	2.11^{c}±0.01	0.50^{d}±0.01	2.14^{c}±0.00	1.70^{c}±0.01	2.06^{ab}±0.04	0.44^{c}±0.01
B	5.67^{a}±0.01	0.93^{b}±0.00	2.13^{c}±0.01	2.00^{c}±0.01	2.19^{c}±0.02	1.87^{a}±0.01	2.00^{a}±0.00	0.42^{d}±0.02
C	5.62^{a}±0.00	0.92^{b}±0.01	3.43^{a}±0.02	2.44^{b}±0.02	3.83^{a}±0.23	1.74^{bc}±0.02	2.07^{a}±0.03	0.53^{b}±0.00
D	5.42^{b}±0.00	1.06^{a}±0.04	3.41^{a}±0.03	2.50^{a}±0.01	2.96^{b}±0.04	1.77^{b}±0.12	2.04^{ab}±0.00	0.63^{a}±0.00
E	5.63^{a}±0.28	0.46^{c}±0.14	2.66^{b}±0.65	0.51^{d}±0.01	2.11^{c}±0.01	1.58^{d}±0.21	2.08^{d}±0.02	0.45^{c}±0.01
LSD	0.03	0.03	0.03	0.03	0.85	0.03	0.08	0.02

Values are means ±S.D of triplicate determinations. Values on the same column with different superscripts are significantly different ($p < 0.05$)

KEY: A= Soursop Coagulated Soycheese, B= Passion Fruit Coagulated Soycheese, C= Baobab Coagulated Soycheese, D= Pineapple coagulated Soycheese, E= Tamarind Coagulated Soycheese

3.3 Amino Acid Profile

The result of the amino acid profile is shown in table 5. There was no significant difference ($p<0.05$) among the products in their isoluecine contents. The baobab coagulated soycheese showed highest amino acid contents in alanine (1.93g/100g), arginine (3.25g/100g), aspartic acid (6.40g/100g), glutamic acid (7.91g/100g), histidine (1.03g/100g), phenylalanine (3.43g/100g) and serine (3.83g/100g). The amino acid contents could be attributed to the protein content of baoab (**Obizoba and Amaechi** 1993; **Sena *et al*.,** 1998). All the coagulants show relatively high contents of amino acids.

Table 6: Effects of Different Coagulants on the *In vitro* Protein Digestibility of Soycheese (%)

	Parameter	
SAMPLES	Dig. @1hr	Dig. @6hr
A	82.76^{d}±0.01	84.58^{d}±0.01
B	80.75^{e}±0.00	83.45^{e}±0.01
C	86.16^{b}±0.02	88.95^{b}±0.12
D	87.45^{a}±0.00	89.78^{a}±0.02
E	85.87^{c}±0.03	86.92^{c}±2.61
LSD	0.03	0.03

Values are means ±S.D of triplicate determinations. Values on the same column with different superscripts are significantly different ($p < 0.05$)

KEY: A= Soursop Coagulated Soycheese, B= Passion Fruit Coagulated Soycheese, C= Baobab Coagulated Soycheese, D= Pineapple coagulated Soycheese, E= Tamarind Coagulated Soycheese

3.4 In Vitro Protein Digestibility of Samples

The digestibility was carried out at two different hours-digestibility at 1 hour and digestibility at 6 hours. The result clearly revealed that there was a significant difference ($p<0.05$) in the digestibility of the soycheese produced using the various coagulants. Soycheese coagulated with pineapple (87.45 % at 1h, 89.78 % at 6h) had a significantly highest ($p<0.05$) content of protein digestibility than those coagulated with baobab (86.16 % at 1h, 88.95 % at 6h), tamarind (85.87 % at 1h, 86.92 % at 6h), soursop (82.76 % at 1h, 84.58 % at 6h) and passion fruit (80.75 % at 1h, 83.45 % at 6h). The percentage digestibility of these coagulants is higher than those of Oboh and Omotosho (2005). They are also very close but higher than the digestibility of that of maize (76.0 %), pigeon pea (77.2 %) and African yam bean (77.0 %) as reported by Oshodi and Hall (1993), and palm wine yeast fermented cassava flour (79.1 %) (Akindahunsi et al., 1999). This was also higher than that of fermented and unfermented garri (a fried cassava product popularly consumed in Nigeria) (66.9-69.0 %). The basis for the wide difference in the digestibility of the soycheese from the same soybean cannot be categorically stated. However, it could be speculated that the difference in the digestibility could be as a result of the difference in the coagulating ability of each of the coagulants with regard to the different type of proteins, in the presence of the various protease inhibitors such as Trypsin inhibitor and chymotrypsin inhibitor (Aletor, 1993). Tannin, Trypsin inhibitor and chymotrypsin inhibitors can interact with proteins in the soycheese or the digestive enzymes thereby reducing digestibility of the protein in the soycheese, and the amount of inhibitors coagulated may have vary from one coagulants to another. However, the reduction in digestibility is more evident in soursop and passion fruit coagulated soycheese.

4. Conclusion

Awara soycheese could be produced from locally sourced plant based coagulants. It has also been demonstrated that soycheese produced from baobab fruit coagulant, Vitamins B1 and A, phosphorus, magnesium contents It is observed that natural coagulants can coagulate soycheese due to their high coagulating ability and their nutritional contents.

References

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