

EFFECT OF LOCUST BEAN (*Parkia biglobosa*) PULP EXTRACT CONCENTRATE AS SUBSTITUTE FOR SUGAR ON THE PROXIMATE COMPOSITION OF BREAD

Yakubu, C.M. and Effi, D.

Department of Food Science and Technology, Federal University of Technology, Minna,
Niger State, Nigeria.

*Corresponding author: calebs@futminna.edu.ng

Introduction

Bread is an exotic food which has for years gained wide consumer acceptance in Nigeria [1]. The basic ingredients include flour, yeast, salt, sugar, fat and water. The role of sugar, the third largest ingredient in bread production, cannot be over-emphasized. Sugars, supply fermentable solids for color compounds in the crust, act as a substrate for the yeast to act upon during fermentation, generate flavour and aroma and improve texture and softness and extend shelf life by their hygroscopicity. However, substantial quantity of sweeteners used domestically and industrially in Nigeria is imported. This is because, local production of sugar, which is regarded as a conventional sweetener has failed to keep pace with demand, resulting in high cost. This inadequacy has been accentuated by nutritional awareness by consumers that intense sweeteners such as saccharin and cyclamates which are other well-known sweeteners possess possible hazardous effects, and also lack the functional roles sugars play in bread making except sweetening. Awareness in this regard has resulted in an upsurge in a number of well-informed consumers who put into consideration the health and nutritional benefits of food products they consume [2]. Furthermore, research findings revealed that glucose is preferentially fermented over fructose when sucrose is added to the bread formula; it is predictable from this that substituting sucrose with a natural glucose-rich source in bread baking will achieve some significant benefits. Therefore, the need to develop and use fruit base sweeteners with desirable functional properties that could serve as substitute for sugar is a step in the right direction. Locust bean pod pulp had been previously reported to contain 60% carbohydrate, 20% reducing sugars, 10 - 24% sucrose and 2.91 mg/100g vitamin C [3]. The pulp contains 1.71% (w/w) total sugar and 7.3 mg/100g ascorbic acid. Due to its high sugar contents, locust bean pulp can potentially serve as a raw material for the manufacture of a concentrate which can be used as a sugar substitute in bread making. This study will reduce the cost of sugar importation due to total dependence on imported sugar, reduce wastage of locus bean fruit during fruiting seasonal due to poor storage facilities and may enhance the micronutrient contents of bread. Therefore, the main thrust of this research was to investigate the effect of locus bean fruit pulp extract concentrate on the proximate composition of bread.

Materials and Methods

The raw materials used included locus bean fruit pulp, wheat flour (2 kg, Golden penny), margarine, salt, yeast, sugar and milk. Moisture, ash, fat, crude fibre, protein, carbohydrate contents were all determined using methods described by AOAC [4].

Results and Discussion

The result of the proximate composition of bread samples at different fruit pulp inclusion levels is presented in Table 1. The result shows that increase in the inclusion level of the pulp concentrate increased the protein, crude fibre and carbohydrate contents of the bread samples while, the moisture, fat and ash contents decreased. The result in this study is in conformity with Akubor [5].

Table 1: Proximate composition of the bread samples.

Ratios (% locust- beans sweetener)	(x) % components in g/100g portions					Calorie Calories/g
	Moisture (%)	Protein (%)	Fat (%)	Crude fibre (%)	Total Ash (%)	
0%(control)	32.97±0.01 ^a	6.65±0.00 ^f	42.50±0.11 ^a	0.13±0.00 ^f	4.76±0.00 ^f	12.95±0.00 ^f
5%	27.60±0.01 ^b	8.41±0.00 ^e	39.50±0.00 ^c	0.59±0.02 ^e	6.10±0.11 ^e	18.80±0.00 ^e
10%	29.20±0.05 ^b	8.76±0.00 ^e	34.50±0.00 ^b	1.18±0.11 ^e	3.55±0.00 ^e	22.80±0.00 ^e
15%	25.87±0.05 ^c	10.51±0.00 ^d	35.00±0.11 ^b	1.76±0.06 ^e	1.72±0.00 ^e	25.14±0.00 ^e
20%	27.37±0.09 ^c	10.58±0.00 ^d	35.00±0.11 ^b	2.35±0.06 ^e	2.44±0.12 ^e	25.39±0.00 ^e
25%	25.90±0.05 ^c	11.03±0.00 ^d	34.00±0.00 ^b	2.94±0.11 ^e	5.52±0.00 ^e	26.60±0.00 ^e
30%	20.46±0.05 ^d	12.43±0.00 ^d	36.00±0.00 ^b	3.53±0.00 ^e	1.48±0.06 ^e	26.10±0.00 ^e

Mean values with different letters on the same column were significantly different from each other ($P < 0.05$).

Conclusion.

Substitution of sugar with locust bean pulp concentrate in wheat flour for bread making, increased the proximate composition (except moisture, fat and ash contents) of breads. Further studies are on-going in our laboratory on the nutritional and sensory properties of the breads.

References

- Gernah, D. I. and Chinma, C. E. (2007). Bread making potentials of cocoyam-maize-wheat flour blends. *Journal of Sustainable Agriculture and Environment* 8(2): 111-116
- Chinma, C. E., Abu, J. O and Abubakar, Y. A. (2010). Effect of Tigernut (*Cyperus esculentus*) flour addition on the quality of wheat-based cake. *International Journal of Food Science and Technology* 45(8): 1746-1752
- Campbell-Platt, G. (1980). African locust bean (*Parkia spp.*) and its west Africa fermented food products. *Dawadana. Ecol Food Nutr* 9: 123-132.
- AOAC. (2000). Approved methods of the American Association of Cereal Chemists. 17th edition, Washington, D.C
- Akubor, P.I. (2007). Protein contents, physical and sensory properties of Nigerian snack food (cake, Chin-chin and puff-puff) prepared from cowpea-wheat flour blends. *International Journal of Food Science and Technology* 39, 419-424.