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Effect of soaking and frying on the physical, chemical and sensory properties of lima beans snack

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Abstract
Effect of soaking and frying on the physical, chemical and sensory properties of lima beans snack were determined using three varieties of lima beans seeds (white, brown and black) and a control from cowpea seeds. Lima beans were milled into grits using fabricated attrition mill and soaked in distilled water for 22 hrs with intermittent change in water medium at 2hours intervals. The dehulled beans were ground into thick slurry, moulded and fried in hot oil until properly dried. Cyanide contents, colour, protein and sensory evaluation of the bean snacks were analyzed. Untreated brown lima bean had higher cyanide contents (28.67 mg/kg) while the black had the least value of 22.61 mg/kg. The values were drastically reduced with soaking time as the least values were observed at 22 hours of soaking. After frying, the cyanide contents were not detected in the beans snacks. The control snack had higher values in lightness (L?), redness (a?) and yellowness (b?) values. There were no significant differences ($p>0.05$) in a? of control and white lima beans. Protein contents ranged from 19.81 to 25.69 %. The control snack had slight increase in protein contents while there were reductions in protein contents of lima beans snacks. Brown and white lima bean snacks were acceptable in crispiness, taste, aroma and in overall acceptability.

Keywords: Colour, Cyanide, Frying, Lima beans, Snack, Soaking,

Introduction
Lima bean *(Phaseolus lunatus)* is a cheap source of protein to the Nigerians rural dwellers (Ezeagu and Ibegbu 2010). It is herbaceous plant belonging to the family Fabaceae in the genus *Phaseollus*. Ezeagu and Ibegbu (2010) further explained that the bean is a source of plant protein to millions of Nigeria and that the type of processing methods used determined the utilization of the beans. Constraints to the consumption of lima beans include longer cooking or soaking time and the presence of anti-nutritional factors (Giami, 2001). Presence of hydrogen cyanide and other anti-nutrients in the beans limit it's use. Various cooking methods such as autoclaving, soaking, germinating, cooking, etc had been used to reduce the hydrogen cyanide contents in lima beans (Akpapunam, 1985; Ologhobo *et al.*, 1984). Lima beans had great potentials in curbing food insecurity but the bean is highly underutilized and unpopular in Nigeria (Seidu *et al.*, 2018). The use of lima beans in making ready to eat snacks had not been thoroughly employed; therefore, this paper presents the effect of soaking and frying on the physical, chemical and sensory properties of lima beans snack.

Materials and Methods
Lima beans varieties (Brown, Black and White) and white cowpea seeds were purchased in a local market at Ado-Ekiti, Ekiti State, Nigeria.

Table 2: Sensory analysis of lima beans snacks

Sample	Crispiness	Taste	Aroma	Overall acceptability
Control	7.22±0.23a	7.80±0.20b	7.55±0.09a	7.58±0.14a
White	6.89±0.12b	8.11±0.34a	7.42±0.22a	7.47±0.10a
Brown	7.13±0.17a	8.36±0.19a	7.49±0.24a	7.88±0.13a
Black	6.45±0.36c	7.93±0.15b	7.27±0.21a	6.24±0.11b

Value with the same letter were not significantly different ($p<0.5$) from each other

Conclusion

This study reveals the effect of soaking and frying on the physical, chemical and sensory properties of a ready to eat snack, made from lima beans. The result obtained from this study shows that snacks from lima beans were comparable to cowpea (control) snacks in the parameters analyzed. It was also revealed that the cyanide content of lima beans were within acceptable limit of cyanide contents in food materials after 20 hours of soaking. It was further revealed that snacks from the brown and white lima beans were more acceptable and were not significantly different with cowpea (control) in terms of general acceptability. It therefore implies that soaking and frying is another way of safely and acceptably utilizing lima beans, especially in the production of ready to eat snacks.

References

Adebayo-Oyetoro A. O., Oyewole O. B., Obadina A. O, and Omemu M. A. (2013). Cyanide and Heavy Metal Concentration of Fermented Cassava Flour (*Lafun)* Available in the Markets of Ogun and Oyo States of Nigeria. *International Scholarly and Scientific Research and Innovation 7(7): 645-648*

Ezeagu, I. E. and Ibegbu, M. D. (2010). Biochemical composition and nutritional potential of ukpa: a variety of tropical lima beans *(Phaseolus lunatus)* from Nigeria – a short report. *Polish Journal of Food Nutrition and Science, 60(3):* 231-235.

Giami, S.Y. (2001). Quality attributes of three new improved lines of Nigerian lima beans *(Phaseolus lunatus* L.Walp.). *Plant Foods for Human Nutrition, 56: 325–333.*

Ologhobo, A.D., Fetuga, B.L. and Tewe, O.O (1984). The cyanogenic glycoside contents of raw and processed lima bean phaseolus lunatus varieties. *Food Chemistry 13(2): 117-128.*

Oshodi, A.A., Ipinmoroti, K.O. and Adeyeye, E.I. (1997) Functional properties of some varieties of African yam bean (*Sphenostylis stenocarpa*) flour — III. International Journal of Food Sciences and Nutrition *48(4): 243-250.*

Seidu, K.T., Osundahunsi, O.F. and Osamudiamen, P.M. (2018). Nutrients assessment of some lima bean varieties grown in southwest Nigeria. *International Food Research Journal 25(2):* 848-853