

Transformation of *Akara* into Extruded Chips: Effect of Cassava Flour Substitution on Consumer Acceptability

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Introduction

Akara or *Koose* is a nutritious deep-fried cowpea-based snack commonly consumed in West African sub-regions like Nigeria, Ghana and the Republic of Benin. However, the unhealthy cooking practices and the uncontrolled frying temperatures had resulted into high uptake of excessive oil, making it high in fat and calories. Repeatedly using of heated frying oil can result to oil degradation and formation of harmful compounds such as trans-fatty acids, acrylamide and polycyclic aromatic hydrocarbons (Olusola & Ajibade, 2022). Frequent consumption of large quantities of *akara* can contribute to weight gain and health-related challenges including obesity and high cholesterol levels. Cowpea flour (CF) substitution with high-quality cassava flour (HQCF) could reduce oil uptake of *akarai*f made into chips. This work investigated if the high oil content *akarain* chips form could be reduced by substituting cowpea with HQCF, with the aim of enhancing consumer's acceptability.

Materials and methods

Cassava roots, cowpea seeds, edible salt, onions and pepper were purchased from a retail market in Ilaro, Ogun State, Nigeria. The roots and seeds were processed into HQCF and CF respectively. CF was substituted with HQCF (30-60%), 100%CF was used as control. Consumer acceptability test of *akara* chips was conducted with untrained panellists.

Results and discussion

Akara chips coded as 60C:40H had the highest significant ($p < 0.05$) scores in appearance, colour, taste, crunchiness and overall acceptability. The crunchy nature of the chips could be associated to the reduction in oil content of samples (Olusola & Ajibade, 2022). The thick crust formed on the chips perhaps by HQCF helped to retain moisture and prevent oil absorption during frying (Oke et al., 2022). Sample 60C:40H has the highest preference with overall acceptability score of 4.4 out of 5.0 of the hedonic scale (Figure 1). Therefore, cowpea-HQCF blends can be used to develop *akara* chips with improvements in the sensory quality and high consumer acceptance.



Figure 1 Spider plot showing the scores of the sensory attributes of *akara* strips

Conclusion

Cowpea-HQCF composites can transform *akara* snacks into chips. There was a significant reduction in the oil content of the chips. Formation of thick crusts on the chips by HQCF and the high-water absorption of HQCF helps to retain moisture and prevent oil absorption. The frying oil reusable must not more than twice to avoid oxidation of the oil that may cause off-flavor, off-odour and darkening of the chips. Sample 60C:40H has the highest preference with overall acceptability score of 4.4 out of 5.0 scale. Therefore, cowpea-HQCF blends can be used to develop *akara* chips with improvements in the sensory quality and higher consumer acceptance.

Keywords: High Quality Cassava Flour (HQCF), Cassava Flour (CF), Akara chips