



Sanitary and nutritional quality of Akpan, a yoghurt-like cereal product from Benin

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AKPAN is a ready-to-drink cereal beverage widely consumed at urban and rural areas in Bénin. Besides the physicochemical, microbiological and sensory characteristics recently investigated (Sacca et al., 2012), parameters such as nutritional quality and chemical safety are still unknown.

Due to its popularity, the nutritional and sanitary quality of Akpan was investigated for preventing any related risk.

Methodology

- Twenty-four samples of Akpan were collected at Cotonou and Porto-Novo, two main cities of Benin. They were classified as Akpan

Results

Nutritional quality of Akpan

- Sorghum Akpan displayed 1.5 to 2 times values of some essential amino-acids (isoleucine, leucine, phenylalanine, threonine, valine; Figure 1) compared to maize Akpan. Methionine and lysine were the most limiting amino-acids, representing less than 6% of RDI in the diet of 100 g of Akpan.

- Sucrose (0.1-0.6 %, db) and glucose (0.1-1.5 %, db) were the main sugars (Fig. 2). Sugar content remained quite low (less than 2%, db) in all Akpan products.

- Tannin content was very low for any process, ranging between 0.02 ± 0.01 % and 0.05 ± 0.02 % (db) for Ogi process (OM, OS) and flour process (FX, FS), respectively.

- Phytate content appeared lower in akpan prepared with Ogi technology (0.58 g IP6/100g, db) than Akpan from flour (0.78 g IP6/100 g, db).

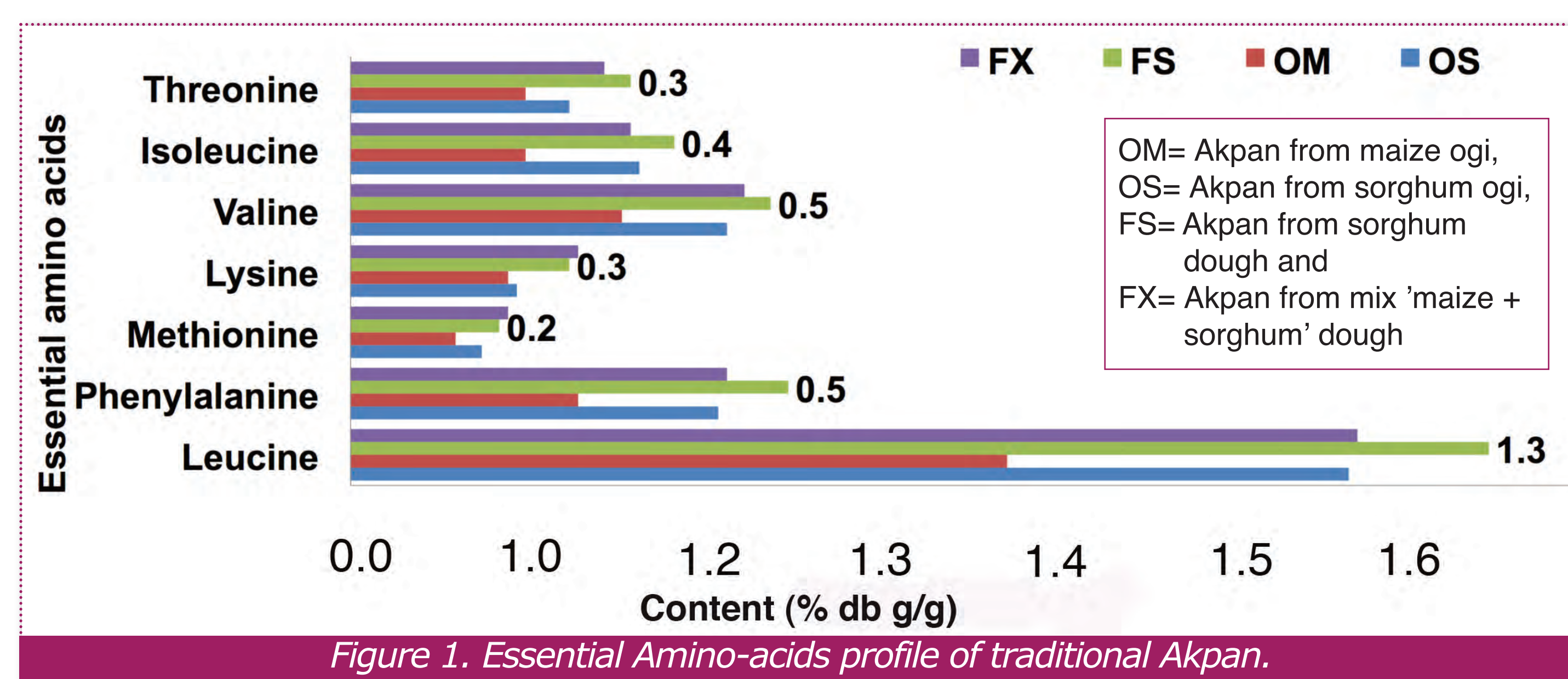


Figure 1. Essential Amino-acids profile of traditional Akpan.

- from maize ogi (OM), Akpan from sorghum ogi (OS), Akpan from sorghum dough (FS) and Akpan from mixture "maize+sorghum" dough (FX). A sub-set of seven samples were used for mycotoxin and amino acid determination.

Sanitary quality of Akpan

- Aflatoxins contents in OM and FX were higher than that in OS and FS. Four products over seven failed to comply with Codex standard and five for European rules. Fumonisin contents were higher in FX and FS than OM and OS; values were far higher in FX (787 µg/kg, db) than European permissive level.

Table I. Traditional akpan from maize contain high level of Aflatoxins and fumonisins (µg/kg)

Products	Aflatoxins		Fumonisin
	B1	B1+B2+G1+G2	
OM	0.4-38.5	0.7-47.9	23-59
OS	1.3-8.8	2.1-12.0	3-12
FS	11.2	17.7	74
FX	2.4-59.7	3.1-66.8	26-787

- The pathogenic germs such as *Escherichia coli*, *Clostridium perfringens*, *Bacillus cereus* were absent (less than 1 log cfu g⁻¹) of the 24 traditional akpan.

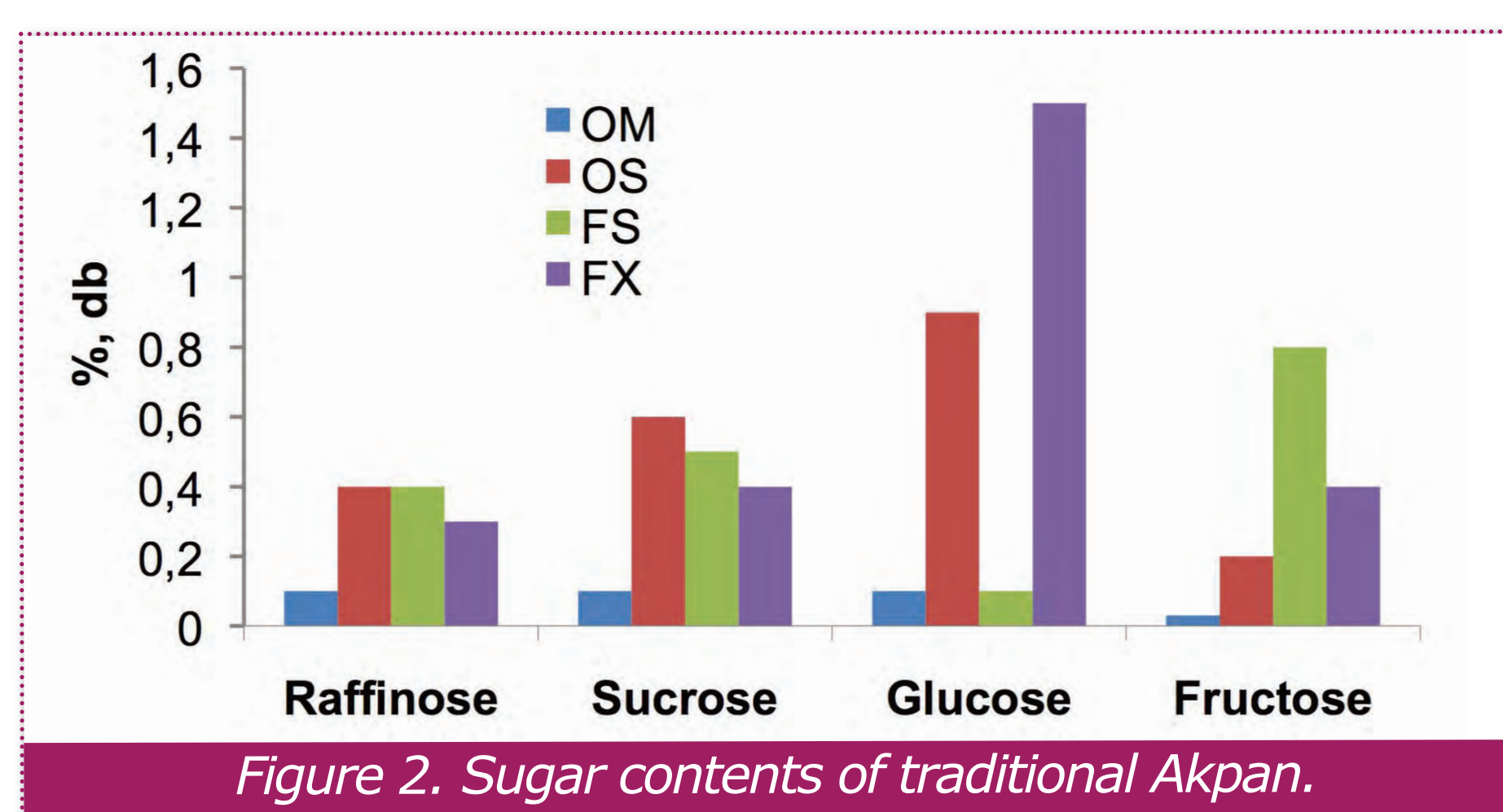


Figure 2. Sugar contents of traditional Akpan.

- Lactic bacteria and yeasts and moulds counts in Akpan from Ogi were lower for Akpan from dough (Figure 3).

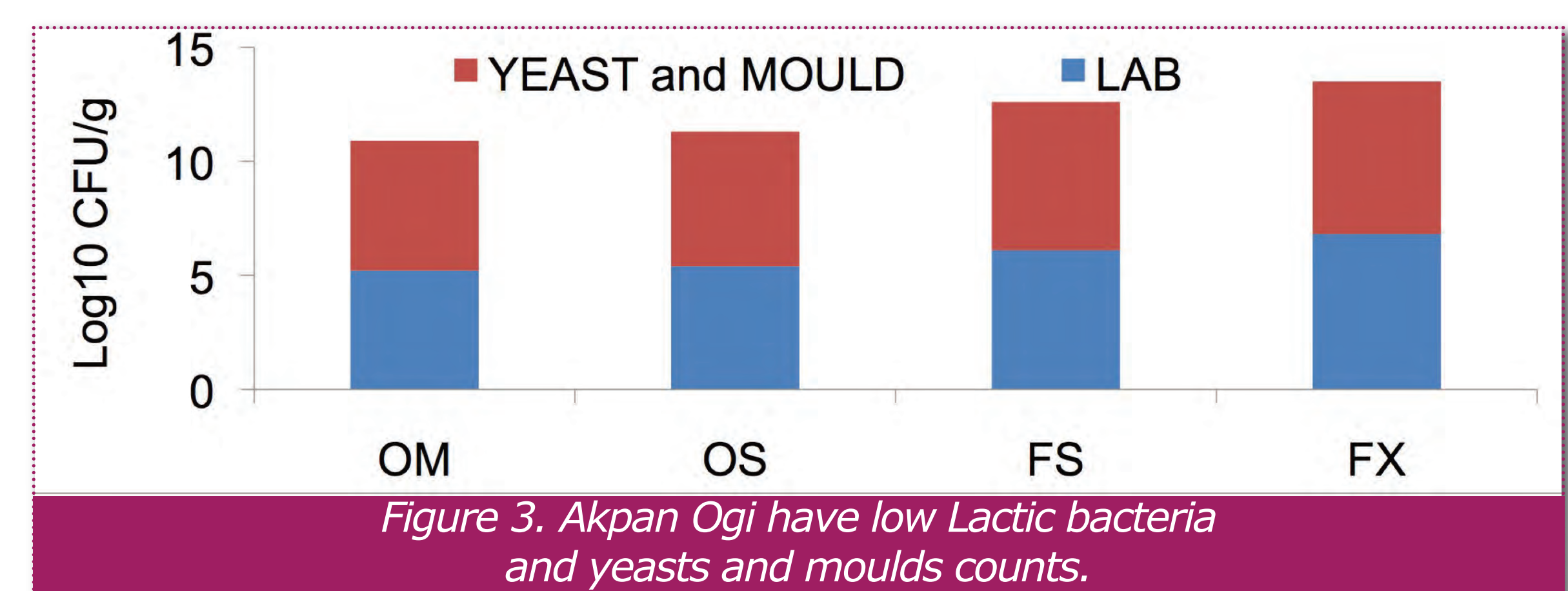


Figure 3. Akpan Ogi have low Lactic bacteria and yeasts and moulds counts.

Reference

Sacca C., Adinsi L., Anihouvi V., Akissoe N., Dalode G., Mestres C., Jacobs A., Dlamini N., Pallet D., Hounhouigan J. (2012). Production, consumption, and quality attributes of Akpan- a yogurt like cereal product from West-Africa. Food Chain. Vol 2, n°2, 207-220.

Conclusion

ESSENTIAL amino acids are relatively high in the sorghum Akpan. Akpan from Ogi (OM, OS) has low phytate content and lower lactic acid bacteria population. Additionally, Akpan from maize can display high level of mycotoxins, revealing potential sanitary risks for consumers. Thus, this process should be re-engineered to guaranty product safety.

