Microbial contamination and occurrence of aflatoxins in processed baobab products in Kenya

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Introduction

The baobab fruit pulp is naturally dried and is rich in vitamin C, calcium, and antioxidants. The pulp has prebiotics and inflammation-reduction functions and hence categorized as a functional food Baobab fruits are subjected to solar drying to ensure an adequate moisture content, which is a long procedure that is sometimes carried out in open and unsanitary conditions, causing safety concerns. This study was conducted to investigate the microbial and aflatoxin contamination levels in ready-to-eat baobab products from selected formal and informal processors in specific counties of Kenya

Methodology

Selected processed baobab products were sampled randomly from formal and informal processors and analyzed for the total aerobic count, Enterobacteriaceae, yeast and molds, ergosterol, aflatoxins, moisture, and water activity.

Formal : KEBS registered

Informal: KEBS unregistered

Fig 1: *Drying of baobab pulp*

Fig 2: *Candies*

Fig 3: *Pulp*

Results

Table 1: *Intrinsic properties and microbial content of baobab products from formal and informal processors.*

Product	Source	M.C (%)	a_w	Tac (log_{10} CFU/g)	E (log_{10} CFU/g)	YM (log_{10} CFU/g)
pulp	Formal	11.84±2.30^a	0.652±0.07^a	3.08±0.08^a	0.70±0.29^b	3.10±0.38^b
	Informal	13.45±1.90^a	0.695±0.04^a	4.30±0.22^b	3.10±0.70^a	5.30±0.11^a
P-value		0.165	0.287	0.05	0.0008	0.0006
candies	Formal	11.28±2.60^b	0.619±0.10^b	5.00±0.24^a	0.00±0.00^b	3.50±0.46^a
	Informal	17.18±3.80^a	0.704±0.06^a	3.60±0.27^a	1.80±0.56^a	3.80±0.25^a
p-value		0.014	0.05	0.65	0.015	0.49

Key: M.C= moisture content, aW= Water activity, Tac= total aerobic count; E= Enterobacteriaceae counts; YM= yeast and molds counts. Values are means of two duplicates replicates and those with the same superscript along the column for each baobab products are not significantly different at P≤0.05.

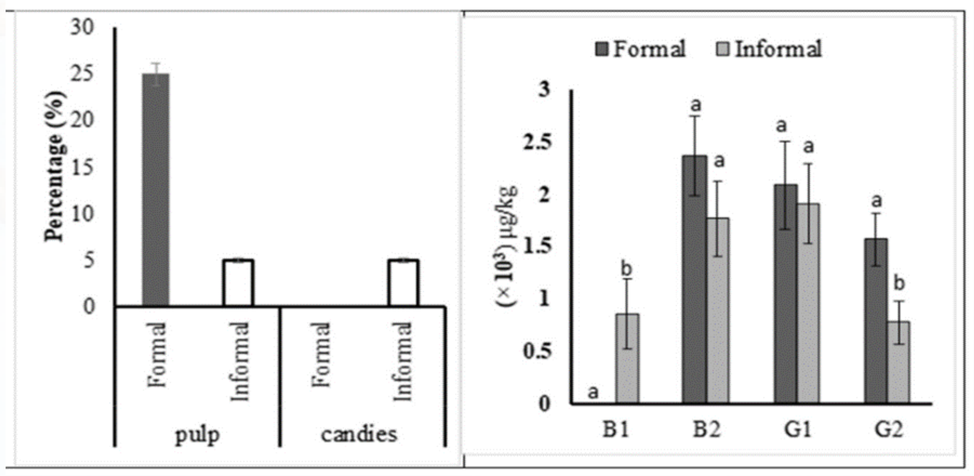


Fig 4:*The percentage of Aflatoxin contaminated samples from formal and informal baobab processors and the mean comparison of the Aflatoxin B1, B2, G1, G2 between formal and informal processors products. The significance levels were considered at p ≤ 0.05*

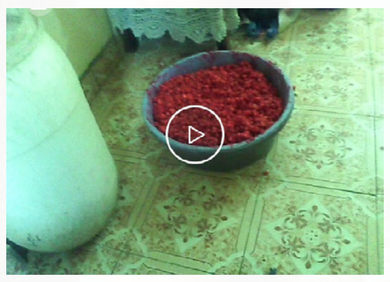
Factors promoting microbial and of mycotoxin contamination

- Unhygienic processing conditions
- Lack of knowledge
- a_w – inadequate drying
- M.C / Humidity- poor storage
- Direct fungal contamination

Discussion

Candies

- Ingredients: water, food colour and sugar Increase in MC



Handling

- The baobab pulp contamination can be traced back to handling practices along the value chain
- Drying, transport,

Mycotoxins

- direct fungal contamination along the value chain
- The formal processors retail at 3000 KES (~$30) for a 200 grams' product
- ·Leads to low turnover of products, prolonged shelf storage

Conclusions

Microbial contamination in processed baobab products shows an unhygienic processing environment while the fungal and aflatoxin contamination may indicate poor postharvest handling, transport and storage conditions of baobab fruits along the baobab value chain.

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BAOQUALITY PROJECT

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TECHNOLOGY FOR DEVELOPMENT

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