

Aflatoxin Elimination in Peanut Products, for Food Security in Africa

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INTRODUCTION

In developing countries, peanut and peanut products are contaminated with high levels of aflatoxins. Such products pose health risks to the consumers. Galvez et al. (2003)¹ developed a simple processing technology, for manual sorting of peanut kernels to sort out aflatoxin contaminated kernels for producing aflatoxin free peanut products. The basic principle of this technology is to slightly roast the shelled nuts to remove the skin and obtain blanched nuts. The blanched nuts allow easy identification, and thus removal, of those kernels which are infected by aflatoxin producing mold.

¹Galvez, F. C. F., M. L. D. L. Francisco, B. J. Villarino, A. O. Lustre, and A. V. A. Resurreccion. 2003. Manual Sorting To Eliminate Aflatoxin from Peanuts. *Journal of Food Protection*. 66(10):1879-1884

RESULTS AND DISCUSSION

The results of the verification of the sorting technology as conducted by the researchers at FRI are presented in Table 1. Table 2 shows the data from peanut samples obtained by the trainees during a workshop conducted at the FRI.

The data in both the Tables confirm that it is possible to identify aflatoxin contaminated kernels by lightly roasting the nuts followed by blanching. Good kernels (without any discoloration) did not have any HPLC-detected aflatoxin. The results also showed that removing highly discolored nuts (>50% discoloration) yielded nuts with aflatoxin level below regulatory allowable limit of 5ppb.

Table 1 – Results from Trial at FRI-Ghana

Sample	Aflatoxins (ug/kg)				
	B1	B2	G1	G2	TOTAL
Raw/unsorted	18.36	1.35	0.04	ND	19.75
S&I	12.93	0.67	11.13	0.60	25.33
Sort -1	42.17	17.66	0.34	0.25	60.42
Sort -2	0.08	ND	0.16	ND	0.24
Sort -3	0.12	0.02	ND	ND	0.14
Good kernels	ND	ND	ND	ND	ND
Testa	2.26	1.08	1.65	0.35	5.34

S&I: Sorted out shriveled and immature kernels

Sort 1: Very, very bad kernels= more than 50% of kernel discolored

Sort 2: Very bad kernels= less than 50% of kernel discolored

Sort 3: Bad kernels = slightly discolored

Good kernels = unstained clean kernels

Table 2 – Results from a Hands-on-Training Workshop at FRI-Ghana

Sample	Aflatoxins (ug/kg)				
	B1	B2	G1	G2	TOTAL
Raw/unsorted	19.13	2.98	1.14	ND	23.25
S&I	103.66	8.97	35.23	4.43	152.29
Sort -1	ND	ND	ND	ND	ND
Sort -2	ND	ND	ND	ND	ND
Sort -3	ND	ND	ND	ND	ND
Good kernels	ND	ND	ND	ND	ND

Pictures



Weighing or raw unsorted shelled kernels



Sorting shriveled, immature and damaged kernels



Roasting peanuts and monitoring temperature



De-skinning roasted nuts



Blowing loose skins to get blanched nuts



Employing a colored chart for identifying discolored nuts



Using HPLC for aflatoxin analysis

OBJECTIVES

The objective of this study was to:

- Examine and verify the processing technology, developed by Galvez, et al. (2002), at FRI-Ghana for removal of aflatoxin contaminated peanuts.
- Conduct hands on training at FRI for food processors and professionals for adopting the processing technology.

METHODOLOGY

The process technology has the following basic steps:

- Start with good quality shelled peanuts
- Sort out shriveled and damaged kernels
- Roast peanuts in an oven (140C and 30 min)
- Blanch (de-skin) the nuts
- Winnow skins from blanched nuts
- Sort for discolored and good kernels using a color chart
- Conduct aflatoxin analysis, using HPLC, on various sorted samples

SIGNIFICANT FINDINGS

- Shriveled, immature and damaged kernels are the most susceptible to aflatoxin contamination
- Blanching offers a perfect platform for effective sorting.
- By removing highly discolored nuts (>50% discoloration), through manual sorting of blanched nuts, it is possible to reduce aflatoxin levels to below regulatory limits.

Enhancing the Peanut Value Chain, from Processing to Marketing of Peanuts and Peanut Products in E. Africa (Uganda) and W. Africa (Ghana)

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