

STUDIES ON THE PRESENCE OF AFLATOXIN IN SOME FOODS

The presence of aflatoxin in various food commodities has been surveyed. Of the samples 1.5% of groundnut, 4.1% of germinated Bengal gram and 7.5% of arecanut were found to contain aflatoxin. The amount of aflatoxin present varied usually between 50-250ppb.

Aflatoxins are produced as secondary metabolites by certain strains of *Aspergillus flavus* and some closely related species (Diener *et al*, 1969 and Van Walbeck *et al* 1968). They are mutagenic, carcinogenic, teratogenic and hepatotoxic and acutely toxic to most experimental and domesticated animals and man (Miller, 1966). Aflatoxin B₁ is the most potent and has been occasionally found in different foods (Singhetia, 1982). There are some reports on the outbreak of acute aflatoxicosis in India due to consumption of food contaminated with aflatoxin (Krishnamachari, 1975).

The aim of the present investigation has been to find out the extent of aflatoxin contamination in groundnut, groundnut oil, germinated Bengal gram, arecanut and coloured scented arecanut. While groundnut and its products are notorious for occurrence of aflatoxin, prolonged storage of soaked gram can expectedly attract fungus infestation and arecanuts are even superficially infested.

A total number of 415 samples of the above mentioned items were collected from the markets of Calcutta. The toxin was extracted from groundnut, germinated Bengal gram, arecanut and scented arecanut according to the procedure described by Coomes *et al*. (1965). For the groundnut oil the procedure described by Pons *et al*. (1966) was followed. All the extracts were concentrated and range of aflatoxin B₁ content was determined, compared to standard sample of aflatoxin B₁, by thin layer chromatography using silica gel G (E. Merck) as absorbent and 5% methanol in chloroform as developing solvent. The results are presented in Table 1.

The method fails to detect aflatoxin below 5 ppb. Quantitation exercise was limited to four groups—5-50, 50-250, 250-1000 and 1000 ppb. Out of 415 samples of food, aflatoxin B₁ was detected in 12 samples. Four samples of groundnut has been found to contain aflatoxin in the range of 50-250 ppb. Aflatoxin was not detected in any sample of refined groundnut oil; it presumably got removed or changed at the time of refining (Spivak 1964). Bengal grams are germinated by soaking in water for two to three days (these are eaten as such or as various preparations), the conditions of germination are quite favourable for the growth of moulds. Of the five samples of Bengal gram found to be contaminated with aflatoxin, four were in the range

TABLE 1. *Aflatoxin B₁ in different foods*

Samples	No. of samples analysed	No. of samples contaminated	Aflatoxin B ₁ range (ppb) of contaminated samples	
			50-250	250-1000
Groundnut	233	4	4	—
Groundnut Oil	20	—	—	—
Germinated Bengal gram	122	5	4	1
Areca nut	20	1	1	—
Scented and coloured areca nut	20	2	2	—
TOTAL	415	12	11	1

of 50-250 ppb and one in the range of 250-1000 ppb. Areca nut is very susceptible to mold infestation specially when it is moist or collected before ripening. Mold infested areca nut can be conveniently used for making coloured and scented preparation. Colour masks of the fungal infestation visually. In the 20 samples of each of coloured scented and non-coloured areca nut two and one sample respectively had been found to contain aflatoxin in the range of 50-250 ppb.

The method followed in the present investigation yielded by and large a single spot corresponding to standard aflatoxin B₁ and having the characteristic blue fluorescence. Other fluorescent spots even if sometimes present were very faint and negligible.

This Laboratory participated in a FAO and Government of India project for monitoring the different contaminants in foods including aflatoxin. The results thereof have not been included here. This paper concerns two foods—germinated Bengal gram and areca nut (and its preparation) on which no studies on aflatoxin contents have so far been known.

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