

Quality and Aflatoxin Contamination in Imported Raw Peanut



Juangjun Duangpatra^a, Penkwan Chompreeda^b, Amara Chinaputhi^c and Parichart Promchote^d

^aDepartment of Agronomy, Faculty of Agriculture, Kasetsart University, Bangkok, Thailand

^bDepartment of Product Development, Faculty of Agro-Industry Kasetsart University, Bangkok, Thailand

^cDepartment of Agriculture, Ministry of Agriculture and Cooperatives, Bangkok, Thailand

^dSustainable Land Use and Natural Resource Management Center, Kasetsart University, Bangkok, Thailand

To increase awareness of the important of aflatoxin problem in peanut, study on seed quality and aflatoxin contamination in imported and local raw peanuts were undertaken to find out the chemical composition and aflatoxin contamination. Survey and collection of imported raw peanuts were undertaken from various parts of Thailand during January to December, 2000. Peanut seed moisture content, chemical analysis for oil, protein, composition of fatty acid and peroxide value were determined. Aflatoxin contamination was analyzed by ELISA procedure. Consumer test of peanut products were done only in peanut lots of which the aflatoxin contamination was lower than 20 ppb. More than fifty percent of imported and local production peanuts were aflatoxin contamination at the level of higher than 20 ppb. Chemical composition and peroxide value of imported and local production peanuts were not different. Result from the consumer test revealed that the local large-seeded peanut variety KU 50 was more favorable than imported peanuts.

Introduction

Consumptional demand of raw peanuts in Thailand is over local production supply (OAE, 2004). Imported raw peanuts in form of dry pods and seeds from nearby countries are found in local small and wholesale markets as well as peanut shelling plants. Information and/or data on quality and aflatoxin contamination in these raw peanut materials have not been studied or reported. To increase awareness of the important of aflatoxin problem in peanut, study on seed quality and aflatoxin contamination in imported and local raw peanuts were undertaken to find out the chemical composition and aflatoxin contamination. Result from this study will be useful to prevent and control of aflatoxin contamination in peanut and peanut products.

Materials and Methods

Survey and collection of imported raw peanuts were undertaken from various parts of Thailand during January to December, 2000. Thirty-one lots of imported raw peanut and sixteen lots of local producing peanuts were collected from small and wholesale markets, peanut shelling plants, peanut manufacturing companies and local farmer storage places. Peanut seed moisture content was tested by using the local made electrical peanut seed moisture tester. Chemical analysis for oil, protein and fatty acid content were done by Proximate Analysis following those that mentioned in A.O.A.C (1990). Composition of fatty acid and peroxide value were determined by Gas Chromatography following the procedures of A.O.A.C (1990). Aflatoxin contamination in peanuts was analyzed by ELISA procedures. Consumer tests of peanut products were done only in peanut lots of which the aflatoxin contamination was lower than 20 ppb.



Results and Discussion

Imported raw peanuts were come from Laos, Cambodia, Vietnam, Myanmar and China. Most of them were shelled out seed with intact seed coat. However, there were some lots from China which were seed coat removal large seeded peanuts. The moisture content of every collected peanuts lots were at satisfactory level which varied from 3.6 to 10%. More than fifty percent of imported raw peanuts as well as those local production peanuts were aflatoxin contamination at the level of higher than 20 ppb (Table 1 and 2). Chemical composition (Table 3) and peroxide value (Table 4) of imported and local production peanuts were not different but peroxide value of coat removal lot from China showed the highest. O/L ratio of imported peanut from Cambodia and coat removal peanut from China were higher than other peanuts. However, result from the consumer test revealed that the local large-seeded peanut variety KU 50 was more favorable to consumer than imported peanuts.



Table 1. Number of aflatoxin contamination of local and imported raw peanut found during January to December, 2000

Aflatoxin (ppb)	Thai* (n)	Imported Peanuts (n)								Total (n)
		China			Laos	Cambodia*	Myanmar*	Vietnam*	Total	
		Seed coat Removal	Intact seed coat	Total						
<20	7	8	3	11	0	2	3	0	16	23
20.1-100	6	0	4	4	2	0	0	0	6	12
100.1-1,000	1	0	0	0	1	3	1	1	6	7
>1,000	2	0	0	0	2	1	0	0	3	5
Total (n)	16			15	5	6	4	1	31	47

*Intact seed coat

Table 2. Percentage of aflatoxin contamination of local and imported raw peanut found during January to December, 2000

Aflatoxin (ppb)	Thai* (%)	Imported Peanuts (%)							Total (%)	
		China			Laos*	Cambodia*	Myanmar*	Vietnam*		
		Seed coat removal	Intact seed coat	Total						
<20	43.8	100.0	42.9	73.3	0.0	33.3	75.0	0.0	51.6	48.9
20.1-100	37.5	0.0	57.1	26.7	40.0	0.0	0.0	0.0	19.4	25.5
100.1-1,000	6.3	0.0	0.0	0.0	20.0	50.0	25.0	100.0	19.4	14.9
>1,000	12.5	0.0	0.0	0.0	40.0	16.7	0.0	0.0	9.7	10.6
Total (%)	34.0			31.9	10.6	12.8	8.6	2.1	66.0	100.0

*Intact seed coat

Table 3. Chemical composition of which the aflatoxin contamination was lower than 20 ppb.

Source	Protein (%)		Oil (%)		Ash (%)	
	Max-Min	Mean	Max-Min	Mean	Max-Min	Mean
Thai*	23.3-27.5	25.5±2.1	40.9-50.0	46.9±4.0	2.31-2.51	2.4±0.1
China (seed coat removal)	24.1-25.8	25.0±0.7	36.8-51.3	48.4±5.7	2.46-2.56	2.5±0.1
China (intact seed coat)	28.0-28.1	28.0±0.0	45.4-50.0	47.6±3.2	2.19-2.27	2.2±0.1
Cambodia*	25.0-26.5	25.8±1.1	42.6-50.5	46.6±5.6	2.60-2.40	2.5±0.1
Myanmar*	25.8-28.3	26.9±1.2	42.5-49.7	47.3±4.1	2.18-2.40	2.3±0.1

*Intact seed coat

Table 4. Peroxide and O/L ratio of which the aflatoxin contamination was lower than 20 ppb.

Source	Peroxide value (milliequivalent/g)		O/L ratio
	Max-Min	Mean	
Thai*	0.67-3.55	1.6±1.4	1.15
China (seed coat removal)	0.50-18.55	10.2±6.8	1.50
China (Intact seed coat)	0.42-1.17	0.8±0.5	2.58
Cambodia*	1.12-1.44	1.3±0.2	2.44
Myanmar*	0.69-1.56	1.2±0.5	1.53

*Intact seed coat

Conclusion

More than fifty percent of imported raw peanuts and local production peanuts were aflatoxin contamination at the level of higher than 20 ppb. Chemical composition and peroxide value of imported and local production peanuts were not different but peroxide value of coat removal lot from China showed the highest. O/L ratio of imported peanut from Cambodia and coat removal peanut from China were higher than other peanuts. However, result from the consumer test revealed that the local large-seeded peanut variety KU 50 was more favorable to consumer than imported raw peanuts.

References

- A.O.A.C. 1990. Official Method of Analysis of the Association of Official Analytical Chemistry. 15th ed. Arlington, Virginia. 1298 p.
- Office of Agricultural Economics. 2004. Groundnuts: Area, production, yield, farm price and farm value. Available source section2/sec2table35.xls.