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FINAL REPORT OF A MISSION
CARRIED OUT IN GHANA
FROM 11 TO 20 SEPTEMBER 2007
IN ORDER TO
ASSESS THE OFFICIAL CONTROL SYSTEMS IN PLACE TO CONTROL
AFLATOXIN CONTAMINATION IN PEANUTS AND PEANUT PRODUCTS
INTENDED FOR EXPORT TO
THE EUROPEAN UNION



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EXECUTIVE SUMMARY

This report describes the outcome of a mission carried out by the Food and Veterinary Office in Ghana, from 11 to 20 September 2007.

The objective was to assess the control systems in place to control aflatoxin contamination in peanuts and peanut products intended for export to the European Union (EU).

There is national legislation in place establishing that goods exported to the EU have to comply with the requirements of the country of destination. However, this legislation is not enforced and in most of the cases the export of peanut and peanut product consignments takes place without official control as regards aflatoxins contamination.

There is a clear division of responsibilities between the different Competent Authorities (CAs). However, there is no cooperation between the relevant CAs. The laboratory is not accredited to ISO 17025 for the analysis of aflatoxins. Method validation and quantification of toxins are deficient.

Small-scale farmers dominate production and most peanut cultivation, harvesting and shelling is done by hand. Traceability back to growers is not possible. No procedures based on the HACCP principles are in place in the exporting establishments. Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP) are not sufficiently implemented. Sampling procedures, when applied, are not in line with or at least equivalent to the EU requirements. To date, there has been no RASFF follow-up.

Some consignments of peanuts and peanut butter are not properly referred in the accompanying export documents which could hamper the application of proper official controls as regards aflatoxins by Member States.

A new export procedure is planned for peanut products with the aim of ensuring compliance with the requirements of EU markets. It is scheduled to have the system in place from November 2007. The new system will require only consignments certified by the CAs to be exported.

Overall, the system in place to control aflatoxin contamination in processed peanuts intended for export to the EU is not applied in most of the cases. No system is in place for raw peanuts. Further shortcomings were found with regard to cooperation with the relevant CAs, sampling, laboratory performance, traceability, identification of exported consignments, RASFF follow-up, GAP, GMP and HACCP implementation. Therefore it cannot be ensured that peanuts exported to EU comply with or are at least equivalent to the relevant requirements as regards aflatoxin. A new export procedure is being drafted and laboratory capability is planned to be increased. However, laboratories will not be in line with EU requirements until a later stage.

The report puts forward a number of recommendations to the authorities of Ghana to address the deficiencies noted.

ABBREVIATIONS AND SPECIAL TERMS USED IN THE REPORT

CA	Competent Authority
CEPS	Customs Excise and Preventive Service
CN	Combined Nomenclature
CSIR	Council for Scientific and Industrial Research
DAVU	District Agricultural Development Unit
EU	European Union
FAPAS	Food Analysis Performance Assessment Performance Scheme
FDB	Food and Drugs Board
FRI	Food Research Institute
FVO	Food and Veterinary Office
GAP	Good Agricultural Practice
GCNET	Ghana Community Network Services
GEPC	Ghana Export Promotion Council
GMP	Good Manufacturing Practice
GSB	Ghana Standards Board
HACCP	Hazard Analysis and Critical Control Point
HPLC	High Performance Liquid Chromatography
ISO	International Organisation for Standardisation
JAOAC	Journal of the Association of Official Analytical Chemists
LOD	Limit of Detection
LOQ	Limit of Quantification
MOFA	Ministry of Food and Agriculture
MS	Member States
PPRSD	Plant Protection and Regulatory Services Department
RASFF	Rapid Alert System for Food and Feed

1. INTRODUCTION

The mission took place in Ghana from 11 to 20 September 2007. The mission team comprised two inspectors from the Food and Veterinary Office (FVO) and one national expert.

The mission team was accompanied throughout the mission by representatives from the central competent authority (CA), the Ghana Standards Board (GSB).

An opening meeting was held on 11 September at the premises of GSB in Accra. Representatives from the GSB were present. During this meeting, the objectives of and the itinerary for the mission were finalised and confirmed by the mission team.

2. OBJECTIVES OF THE MISSION

The objective of the mission was to:

- verify whether systems are in place to control aflatoxin contamination in peanuts and peanut products intended for export to the European Union within specified European Union (EU) contaminant limits, in compliance with or at least equivalent to Commission Regulation (EC) No 1881/2006.¹

In pursuit of this objective, the following visits were carried out in accordance with the itinerary agreed between GSB and the FVO:

COMPETENT AUTHORITY VISITS			Comments
Competent authority	Central	4	GSB Ghana Export Promotion Council (GEPC) Plant Protection and Regulatory Services Department (PPRSD) Food and Drugs Board (FDB)
	Regional level	6	Ministry of Food and Agriculture (MOFA) – Northern Region - Tamale PPRSD offices in Tema port and Accra airport GEPC Tamale Customs authorities in Tema port and Accra airport (Greater Accra Region)
LABORATORY VISITS			
Official Laboratories		3	Food Research Institute (FRI), GSB, and FDB
FARMERS			
Peanut cultivations		1	Savelugu District (Northern Region)
PROCESSING ESTABLISHMENTS			
		2	Processors/exporters of peanuts and peanut products in Accra
PORTS OF EXPORT			
Accra		2	Tema port and Accra airport

¹ Legal acts quoted in this report refer, where applicable, to the last amended version. Full references to the acts quoted in this report are given in the Annex.

3. LEGAL BASIS AND OTHER RELEVANT LEGISLATION FOR THE MISSION

3.1. Legal basis

The mission was carried out in agreement with the GSB and under the general provisions of Community legislation, in particular:

- Article 46 of Regulation (EC) No 882/2004 of the European Parliament and of the Council.

3.2. Other relevant legislation

All other relevant legislation referred to in this report is listed in Annex 1 to the report.

4. BACKGROUND

4.1. Overview of previous missions regarding aflatoxin contamination in foodstuffs

The European Commission has carried out missions to Iran, Egypt, Turkey, China, India, Argentina, Brazil and the United States with the objective of evaluating official control systems for the prevention of aflatoxin contamination in foodstuffs originating from those countries. In addition, missions to 16 Member States (MS) with the objective of assessing controls on imported products of plant origin have been carried out. The reports on these missions are available on the DG Health and Consumer Protection internet site at:

http://europa.eu.int/comm/food/fvo/index_en.htm.

4.2. Background to present mission

The average yields of peanuts achieved annually in Ghana total some 134 000 tonnes. Peanuts are mostly cultivated in all districts of the Northern, Upper West and Upper East regions and some districts in the Brong Ahafo and Ashanti regions.

According to Eurostat's database, in 2005, 7762 tonnes of peanuts and peanut products were exported to the EU (7177 of which were shelled peanuts and 1.6 peanut butter). In 2006, the export volume was 3295 tonnes (3043 of which were shelled peanuts and 2.9 peanut butter).

Information regarding foodstuffs found by MS competent authorities to have public health implications is disseminated through the Rapid Alert System for Food and Feed (RASFF) to MS and to the exporting country. From 2005 to the time of the mission, 36 notifications relating to aflatoxins in peanuts and peanut products from Ghana were made through the RASFF. The breakdown of RASFF notifications and the volume of imports into the EU are shown in Table 1. The main importing MS are indicated in brackets.

All EU RASFF notifications relating to peanuts and peanut products with excessive levels of aflatoxins have been notified by the UK.

Table 1: Imports of peanuts and peanut products originating from Ghana into the EU

	Imports to EU (tonnes)		Number of alerts		
	2005	2006	2005	2006	2007 (up to Oct)
CN 12021090 Groundnuts in shell	559 (UK, BE)	233 (BE)	2	2	1
CN 12022000 Shelled groundnuts	7177 (UK, NL, BE)	3043 (NL, UK)			
CN 20081110 Peanut butter	1.6 (NL, AT)	2.9 (NL, DE)	11	18	3

Source: Eurostat database and EC, RASFF database

In view of the high number of RASFF notifications, and the fact that at least 19 consignments of peanut butter were rejected on the basis of aflatoxin levels above to 50 µg/kg for aflatoxin B1 since 2001, the European Commission decided to undertake a mission to Ghana with the objective set out above.

4.3. Food product information related to public health issues

Aflatoxins are mycotoxins produced by certain species of *Aspergillus*, which develop at high temperatures and humidity levels and may be present in a large number of foods. The aflatoxin group includes a number of compounds of varying toxicity and frequency in food. Aflatoxin B1 is the most toxic compound. For safety reasons, it is advisable to limit both the total aflatoxin content (compounds B1, B2, G1 and G2) of food and the aflatoxin B1 content. Maximum limits for aflatoxins in food were set in EU legislation taking into account the known possible effects of sorting, mixing or other physical treatment methods to reduce the aflatoxin content of the nuts. In accordance with Annex I to Commission Regulation (EC) No 1881/2006, the maximum admissible aflatoxin levels in groundnuts are as follows:

- a) Groundnuts, nuts and dried fruit and processed products thereof, intended for direct human consumption or use as an ingredient in foodstuffs:

2.0 µg/kg aflatoxin B1 content, and
4.0 µg/kg total aflatoxin content.

- b) Groundnuts to be subjected to sorting or other physical treatment, before human consumption or use as an ingredient in foodstuffs:

8.0 µg/kg aflatoxin B1 content, and
15.0 µg/kg total aflatoxin content.

5. MAIN OBSERVATIONS

5.1. Relevant national legislation

The relevant Ghanaian legislation within the scope of this mission is as follows:

- Standards Decree NRCD 173, 1973 establishing the aims, functions and powers of the Ghana Standards Board. In particular, Article 3.2 (d) states that the Board shall ensure that goods prepared and manufactured for export are distinctly marked for export, certified and comply with the requirement of standards of the country of destination. Nevertheless, it has been observed that concerning the export of peanuts and peanut products to the EU, provisions on traceability, procedures based on HACCP principles and accreditation of laboratories against ISO 17025, are not included in Ghanaian Standards.
- Ghana Standards (Certification Mark) Rules, 1970 (L.I 662) states that no person shall distribute, prepare for export or export goods unless they have a valid licence to use the Ghana Standards Certification (if standards specifications are fulfilled).
- Ghana Standards Board General Labelling Rules, 1992 (L.I 1541) establishes labelling requirements and states that no person shall offer for sale, sell, distribute or import pre-packaged food unless the food is labelled in accordance with the requirements including name and address of the producer or distributor or seller and the indication of the batch.
- The procedure applied to sample export consignments to the EU is as described in the GS 60: 1990 "Method of sampling of cereals (as grain)". The mission team examined this standard and noted that this procedure is not in compliance with or at least equivalent to Commission Regulation (EC) No 401/2006.
- National limits on aflatoxins are specified in product standards such as:
 - GS 49: 2005: Specification for peanut butter and peanut butter crunches (setting a limit for total aflatoxins content of 4µg/kg).
 - GS 764: 2003: Cereals, pulses and legumes – Specification for peanuts (setting a limit for total aflatoxins content of 20µg/kg).
- General food hygiene requirements are laid down in the Ghana Standard GS 66:1990 "Code of Practice - General Principles of Food Hygiene".
- Enforcement powers of GSB inspectors are stipulated in Standard Decree NRCD 173, 1973, LI 662 and LI 1541.
- Under Plant Pest and Disease Control Acts 307:1965, the PPRSD is responsible for the phytosanitary control of exported peanut consignments. It is also responsible for official controls on raw peanuts intended for export.
- Right of appeal against a decision on certification of establishments is set out in Standard Decree NRCD 173, point 12.9, and LI 662 point 7. Right of operators for a supplementary expert opinion in case of non-conforming consignments as set out in Article 54.3 of Regulation (EC) No 882/2004, is not considered in the national legislation.

5.2. Competent authorities

5.2.1. Ghana Standards Board

The GSB belongs to the Ministry of Trade and Industry and its aim is to promulgate standards with the objective of ensuring high quality of goods produced in Ghana, whether for local consumption or for export, and to promote standardisation in industry and commerce.

The GSB is responsible for certification of processed food products intended for both local consumption and export. Activities undertaken in the performance of its mandate for product certificate include sampling, inspection of premises, testing and market surveillance. The GSB is also responsible for verifying compliance of exporting establishments against standards.

Within the GSB there are 6 directorates, three of them are relevant to this mission: Quality Assurance, Standards and Testing. At the regional level there are 5 GSB offices.

At the Inspectorate Department, which belongs to the Quality Assurance Directorate, there are 8 inspectors responsible for the control of aflatoxin contamination in peanut and peanut products.

The Food and Agriculture Laboratory of the GSB belongs to the Testing Directorate (see also Section 5.6).

Regional offices do not participate in export controls activities as to date there are no export-certified establishments located at regional level.

The mission team checked several training files of the staff at central level. Training in different areas has been provided. However, no training has taken place with regard to sampling for the analysis of aflatoxins in accordance with EU standards or on the official controls of consignments intended for export to the EU.

5.2.2. The Ministry of Food and Agriculture

The main agencies within the Ministry of Food and Agriculture (MOFA) relevant to this mission: the Plant Protection and Regulatory Directorate (PPRSD) and the District Agricultural Development Units (DAVUs).

The PPRSD controls agricultural products including plants and plant materials for diseases and pest. The PPRSD is also responsible for issuing phytosanitary certificates before export and also for issuing export consignment certificates as regards aflatoxins for raw peanuts.

Agriculture Extension Officers of the DAVUs have the role of assisting farmers and provide them with information on production, harvesting and storage of peanuts.

The mission team noted that several information leaflets addressed to farmers were available at the regional offices. Two of them were relevant to the scope of the mission, and included information on crop rotation, soil fertility and pest management. However, no comprehensive guidelines with regard Good Agricultural Practices (GAP) in peanut production have been developed by the MOFA.

The mission team required training files on PPRSD staff and extension officers, but no evidence of training with regard to GAP, sampling and official controls in connection with aflatoxin contamination was presented.

5.2.3. Ghana Customs Excise and Preventive Service (CEPS)

The CEPS is a service of the Ministry of Finance and is responsible for customs clearance of peanut consignments to be exported.

5.2.4. Other organisations

5.2.4.1. Food Research Institute (FRI)

The FRI belongs to the Ministry of Education, Sports and Science and is one of the thirteen affiliated institutes and centres of the Council for Scientific and Industrial Research (CSIR). The CSIR's mandate is to conduct applied research in food processing in support of the food industry and also to advise government on food policy. It focuses on providing scientific and technological support to the growth of the food and agricultural sectors.

The FRI has collaborated with two American Universities on two projects related to mycotoxins in peanuts and peanut products and several reports and publications resulted from these projects. Four reports were shown to the mission team; they were basically surveys with the objective of study and describe the peanut production and the traditional peanut processing industry among other issues. No specific results or actions implemented were shown to the mission team as a consequence of this research.

The FRI has the only laboratory undertaking aflatoxins analysis in peanuts and peanut products for export purposes (see also Section 5.6).

5.2.4.2. Ghana Export Promotion Council (GEPC)

The GEPC is an Agency that reports to the Ministry of Trade and Industry. Its main role is to develop and promote the export of non-traditional products. It has a register of exporters and provides advice and support on export activities.

5.2.4.3. Food and Drugs Board (FDB)

The FDB is responsible for the control of peanut and peanut products on the domestic market but plays no role in export controls. It is planned that the FDB laboratory will participate in the aflatoxins analysis of exporting consignments in the future (see also section 5.6).

5.3. Process controls in the peanut production chain

5.3.1. Nut cultivation

The main production area of groundnuts is the Northern Ghana, with a total production of 89 661 tonnes of groundnuts in 2006 and a total of 105 867 hectares cultivated.

In the Savelugu District visited, (Tamale Region), farmers that live in small communities and have an average of 1 to 5 hectares dominate production. The number of farmers cultivating peanuts is not known.

Peanut crops are frequently mixed with other crops (sorghum, maize, cowpea, etc.). In most instances no form of chemicals (fertilizers, herbicides, fungicides and insecticides) to minimise fungal infection and insect damage are used in peanut cultivation.

Most peanut cultivation, harvesting and shelling is done by hand by farmers and family members and is a purely rain-dependent cropping system. Hired labour is also used. Seeding is by hand and in most cases farmers either use seed from their own stock or purchase it from the local market.

Harvesting begins after the rainy season, on average 125 days after a period of cultivation, which usually goes from April to September, depending on the variety and climate conditions. On average, harvested plants are left in the fields for direct sun drying for 3-7 days or even more in some instances.

After drying, the pods are separated from the plants manually and carried from the field back to the community where they are exposed to further sun drying. Harvested peanuts are either stored in sacks or in storage facilities made from thatch where they can be stored for up to a year, if necessary, depending on the market price.

In general, peanuts are manually shelled and partially sorted shortly before being sold. After shelling, peanuts are bagged in either jute or polypropylene sacks and brought to the market. They can also be sold in-shell.

The mission team was informed by the MOFA that periodic meetings and spot visits to the communities are organised by extension officers to provide farmers with information regarding production, harvesting and storage of peanuts. However, it was stated by MOFA staff that this advice is not always followed by the farmers. No evidence was available of the meetings organised by the extension officers of the MAF with farmers.

Peanuts from different communities are gathered in storage facilities at the local markets. There peanuts are sieved, graded and stored. No sorting operations to remove damaged kernels take place at this stage. In some instances, kernels are exposed to final sun drying on the market streets if considered convenient. The mission team noted that no labelling takes place at this stage and no selling registers are kept, which is not in compliance with Article 18 (4) of Regulation (EC) No 178/2002. The peanuts are then sent to Accra where they are processed and /or exported.

Market storage facilities were built with materials that do not permit adequate cleaning and maintenance and were not sufficiently protected against rain and pests. Facilities were not kept in good repair and condition and hygiene conditions were not adequate. This is not in accordance with Regulation (EC) No 852/2004, Chapter I and II, Annex I.

Sacks containing peanuts were stored in piles, which could cause heat built-up and moisture accumulation. In some instances, they were left in direct contact with the floor.

This is not in accordance with the requirements of point 3.5 of the Codex Alimentarius "Code of practice for the prevention and reduction of Aflatoxin contamination in peanuts - CAC/RCP 55-2004" and Regulation (EC) No 852/2004, Annex I and Chapters I and II of Annex II.

5.3.2. Nut processing

The mission team was informed by the GSB that the number of peanut processing companies that are exporting to the EU is not known. It was also stated that it is not

possible to contact the operators mentioned in the RASFF notifications due to difficulties in identifying their location. For the same reason the mission team could not visit any of the establishments involved.

In practice only 4 companies are certified by the GSB as exporters. It is important to highlight that according to the RASFF system database (2005-October 2007), there have been at least 20 companies involved in RASFF notifications up to now.

Small-scale production of peanut products was observed by the mission team in Tamale. All operations in the production of peanut products were carried out manually (with the exception of milling) and in the open air. The hygiene conditions were not appropriate and the utensils used were not made of corrosion-resistant materials. This is not in compliance with Regulation (EC) No 852/2004, Chapter II, Annex II. The mission team was informed that all products manufactured under such conditions are for the internal market only. No evidence could be seen by the mission team of any controls applied at this level that would ensure that these products could not be exported.

Two establishments were visited by the mission team, both producing roasted peanuts and one also manufacturing peanut butter. Both companies are certified by the GSB but only one is exporting peanuts to the EU at present. This company has exported 5 consignments to the EU and all were certified by the GSB.

In both companies visited some of the working facilities were built with materials that do not permit adequate cleaning and maintenance and some utensils used were not made of materials able to be clean and disinfected, which is not in compliance with Regulation (EC) No 852/2004, Chapter I and II, Annex II. Inspection files were not available during the visits.

The mission team noted that none of the companies had implemented Good Manufacturing Practices (GMP) and had put in place a procedure based on the HACCP principles, as required by Articles 5 and 10 of Regulation (EC) No 852/2004.

On reception, the quality of peanuts supplied is not monitored and specifications for the purchase of peanuts intended for further processing are not available. Aflatoxin analyses before raw peanuts are accepted for processing are not carried out and no assistance is given to suppliers by processors. This is not in line with point 46-48 of the Codex Alimentarius "Code of practice for the prevention and reduction of Aflatoxin contamination in peanuts - CAC/RCP 55-2004".

Blanching and manual sorting before and after roasting took place in both companies. In one of the companies, aflatoxin analysis was sometimes carried out on final products.

Traceability back to suppliers was not possible because raw peanuts have no label when received and registers of raw materials are not kept at reception.

5.3.3. Non-conforming products

No rejected consignments of peanuts and peanut products exported to the EU from Ghana have been received to date. However, it was stated that in such cases they would be considered to be imports.

5.4. Method of sampling for peanut consignments

The sampling procedure for checking the presence of aflatoxins in peanuts intended for export to the EU was not seen in practice. The mission team had the opportunity to attend a quick explanation given by GSB staff of the procedure followed in the facilities of one of the establishments visited. The GSB representative made a random selection of 6 plastic bottles containing shelled peanuts, taken from a batch of 114 boxes containing 24 bottles of 350 g net weight each. The net weight of the lot was 957 kg.

The sampling procedure followed by the GSB is based on GS 60: 1990 "Method of sampling of cereals (as grain)". Pursuant to Annex A (sampling scheme for consignments of more than 100 units – bags or cases), for consignments larger than 100 units the referred number of units to be sampled are approximately the square root of the number of units in the consignment.

5.5. Procedure for exporting nuts to the EU

According to the GSB (source of data: GEPC), in 2006, about 6330 tonnes of peanuts and peanut products were exported to the EU from Ghana, 22.4 tonnes of which was peanut butter. According to Eurostat, 3295 tonnes were imported from Ghana, of which 2.9 tonnes was peanut butter.

The mission team noted that, in terms of the volumes of peanuts and peanut products exported to the EU, there are significant differences between the data obtained from Eurostat and the data provided by the GSB. No reasons for these differences could be identified by the GSB when informed.

At present, the export procedure at the visited port of Tema commences when the forwarding agent enters data on the consignment into the customs database, GCNET. The data is then printed on a customs declaration form and presented with the invoice for the consignment at the verification office of the CEPS. Customs check that the information on the declaration is compatible with the invoice and the data in GCNET. The customs declaration is then signed and returned to the forwarding agent.

The forwarding agent requires for a phytosanitary certificate to the PPRSD inspectors located at the port. This certificate is issued after a visual inspection of the consignment and it is a compulsory requirement by customs in order to be able to export. The documentation is then presented to the export office of the CEPS.

The documentary and identity check of the consignment takes place at the export office of the CEPS as a rule and the consignment is sealed. However, in the case of peanuts this check is done at the premises of the exporter and seal controls take place at the port. Finally, the consignment is handed over to the forwarding agent and customs cleared.

At the airport, the exporter needs to apply for an "instruction for dispatch of goods" (IDG) to the aviation company and for a phytosanitary certificate. Documents are then handed over to customs for customs clearance. In the case of perishable foods, the Customs declaration is done after the consignment is cleared.

Customs officials stated that food consignments below 50 kg can be cleared without being submitted to customs control.

The mission team noted that the only certificate required by customs with regard to consignments of peanuts and peanut products for export to the EU is the phytosanitary

certificate issued by PPRSD. No certification issued by GSB is required for processed peanuts and no certification issued by PPRSD is required for raw peanuts. Furthermore, customs does not notify the export of these consignments to the GSB or PPRSD.

The mission team was informed that the total number of consignments exported to the EU to date is unknown. It was observed that, until now, only 5 consignments of processed peanuts have been submitted to official control by the GSB and sampled and analysed for aflatoxins prior export to the EU. No consignments of raw peanuts have been submitted to official control by PPRSD. It is important to highlight that according to the RASFF system database (2005-October 2007), 37 consignments have been rejected by MS and notified through the RASFF system up to now.

No enforcement actions had been taken by the GSB against operators exporting consignments without having the Ghana Standards Certification and without having the necessary consignment export certificate issued when exporting.

The mission team noted at the Accra airport that some peanut consignments presented to the PPRSD for phytosanitary certification were not properly labelled.

It was also noted that most of the peanut consignments cleared at Accra airport are small consignments and usually mixed with perishable vegetables, although this is not clearly detailed in any of the accompanying documents. It was observed that in the relevant RASFF notifications and accompanying documents available in the Commission RASFF database, most of the consignments are referred in the airway bills or bills of lading either as "food items", "fresh vegetables" or "produce of the soil".

The mission team was informed that a new export procedure for the processed food industry (which includes peanut paste and peanut butter) has been drafted by the relevant CA. This new system is not in place yet, but CAs are planning for it to be operational in November 2007.

Under the proposed new procedure exporters of processed peanuts have to be registered by the GEPC and to have an "Exporter Registration Certificate" issued by the GSB. To be able to export a particular consignment to the EU exporters have to have an "Exporter Consignment Certificate".

Each peanut and peanut product consignment intended for export to the EU will have to be sampled and analysed for aflatoxins before export by the GSB. Based on the results of the analysis and the labels submitted, the GSB will issue an export certificate. Exporters will then present the export certificate to Customs at the point of exit.

The mission team was informed by the GSB that this new procedure will mean better communication with the CEPS, presence of the GSB at export points, application of sanctions for non-compliance and greater analytical capability with the participation of two further laboratories in the analysis of aflatoxins in samples intended for export. Furthermore, the GEPC is registering all processed food exporters.

A list of 28 companies, whose locations have been geographically mapped, has been sent to the GSB for them to proceed with premises inspection.

It is planned that the new procedure will also include export controls on raw peanuts by PPRSD but no written evidence was seen. It was also noted that none of the customs agents or PPRSD inspectors interviewed at the port and airport was aware of the new procedure.

5.6. Laboratory services

5.6.1. Laboratories visited

The mission team visited the CSIR Food Research Institute in Accra, which is currently the only laboratory carrying out analyses of aflatoxins in peanut and peanut products intended for export to the EU.

Analyses of aflatoxins are performed in the Toxicology - Mycotoxins Unit of the Food Chemistry Division, which employs 4 staff, 3 of them graduates. The laboratory carries out aflatoxin analyses not only for the GSB but also for private companies and research purposes.

The mission team was informed that in 2006 a total 122 samples were analysed for aflatoxin in different foodstuffs; (13 official samples from GSB). Out of this number, 38 were peanut samples. In 2007 (as at 14th September) a total of 114 samples had been analysed; of which 28 were peanut samples (6 official samples from GSB). For both years (2006 and 2007), 14 out of the total of 236 samples analysed had above 20 µg/kg for total aflatoxin.

The FRI laboratory has already been accredited by the South African National Accreditation System (SANAS) for a number of tests/properties (moisture, protein, fat and ash in food and feed, and 11 microbiological determinations) but not yet for aflatoxins.

The laboratory has a quality manager and quality control schemes in place and intends to apply for accreditation in aflatoxin analysis after adoption and in-house validation of a new analytical procedure. This is not planned to be effective before next year. Sufficient documentation was presented to the mission team in general, in particular in relation to regular internal audits. Any shortcomings that were found had to be rectified and reported.

The staff are well aware of the operations described in the analytical SOP. Training records of some of these staff were shown to the mission team and were adequate.

The laboratory is well organised and the premises and equipment are adequate, except for the mill for grinding samples, which was not suited to preparing samples taken from large consignments pursuant to Annex I.D of Regulation (EC) No 401/2006. The mission team was informed that the average sample size received in this laboratory was 1 kg, approximately. The laboratory had the necessary equipment in place to homogenise peanut samples of that size.

The analytical procedure was based on the method published in JAOAC, Vol. 62 (1979), pages 586-594. Extraction from the sample was performed with methanol, followed by a number of clean-up steps (two of them by column chromatography with cellulose and silica gel, respectively), and determination using HPLC with fluorescence detection after post-column derivatisation with iodine for the determination of toxins. The method uses a single standard concentration to estimate the toxins levels rather than calibration curves, which do not comply with the criteria established in point 1(k) of Annex III to Regulation (EC) No 882/2004.

The in-house validation of the analytical procedure was performed on maize rather than peanuts. In addition, the recovery rate was estimated at only one level and the LOQ was not checked as the lowest validated concentration. The repeatability tests were carried out

(on maize) at two levels: 1 µg / kg and 100 µg / kg for aflatoxin B1. The in-house validation was not in compliance with the requirements of the IUPAC Technical Report on “Harmonized guidelines for single-laboratory validation of methods of analysis” as published in Pure Appl. Chem., vol 74, n° 5, pp 835 – 855, (2002) and section 4.3.1, Annex II to Regulation (EC) No 401/2006.

The laboratory participates once every two years in international proficiency tests for aflatoxins in peanuts with satisfactory results (z-score < 2). The laboratory uses a sample of naturally contaminated maize as reference material for internal quality control; an aliquot of that sample is analysed for recovery checking every 20 samples, control charts being used.

As regards traceability, two analytical reports (one positive for aflatoxins and one negative) were checked. The reported LOD in the case of the negative sample were 0.04 and 0.06 µg/kg for aflatoxin B1, B2 and G1, G2, respectively. Recovery rates and measurement uncertainties of the analytical results were not reported, which is not in compliance with section 4.4, Annex II to Regulation (EC) No 401/2006.

Table 2: Summary of laboratory performance for the laboratory visited

	Laboratory of the CSIR Food Research Institute
Accreditation	Not accredited to ISO 17025 for the determination of aflatoxins
Validation	The method was in-house validated on maize. Method-specific in-house validation documentation in place. Recovery was tested by spiking at just one level.
Premises:	Clean, tidy, clearly arranged. Overall appearance of the laboratory fulfil the requirements of ISO 17025
Method and Equipment	Equipment meets requirements except the mill for preparing samples taken from large consignments. Extraction: JAOAC, (1979), 62, 586-594 Clean-up: cellulose and silica gel column chromatography Determination: HPLC-FLD after iodine post-column-derivatisation aflatoxins standard : Liquid, Biopure AF Mix, ref. BRM 002021
Quality Assurance (References, Spikes, etc).	Proficiency tests: once every 2 years (international). Two results up to now with z-score < 2. Internal audits: yes Use of internal reference material (naturally contaminated maize material): once every 20 samples.
Analytes	Aflatoxin B1, B2, G1, G2 and total
Sample Management	The documentation system provided good traceability.
Calibration Standards	Certified stock-standard solution of an aflatoxins mixture (ready to use). Certificate available.
Calibration Curve	Calibration curve was not used. A single-point calibration was used.

Recovery (%)	Rates at one level (5 µg/kg for aflatoxin B1 and G1, 1.5 µg/kg for aflatoxin B2 and G2) were in accordance with the performance criteria establish in Annex II (section 4.3.1) to Regulation (EC) No 401/2006, except for aflatoxin G2, which was <70%.
Analytical uncertainty	The expanded measurement uncertainty was calculated once every year. Its estimation was based on in-house validation data for repeatability and recovery.
LOD	0.04 µg/kg for Af B1 and B2; 0.06 µg/kg for Af G1 and G2 (The LODs were estimated by dilution of standards until not detectable)
LOQ	Not calculated.

Two additional laboratories were visited by the mission team, the GSB laboratory and the FDB laboratory. None of these laboratories perform at this moment aflatoxins analysis.

The GSB laboratory had the necessary equipment except the derivatization cell which is expected to be received soon and has the intention of starting analyses for aflatoxins in December 2007.

The FDB laboratory had the instrumental equipment although aflatoxins standards were not available yet. They expressed the intention to be ready for aflatoxin analysis after moving to the new premises which is planned for December this year.

5.7. Response to RASFF notifications

From 2005 to October 2007, 36 RASFF notifications of peanuts and peanut products have been notified by MS through the RASFF system. In 11 of the notifications the detected levels for aflatoxin B1 were above 50µg/kg.

No routine procedure has been established for RASFF follow-up to date and no RASFF follow-up has taken place.

The GSB informed the mission team that it is difficult to identify exporters that have been involved in RASFF notifications (see also section 5.3.2).

6. CONCLUSIONS

6.1. Relevant national legislation

- (1) The relevant legislation provides for enough legal powers for consignments to be certified and for compliance with the standards of the country of destination to be required. However, in most cases this legislation is not enforced.
- (2) Provisions on traceability, HACCP principles and accreditation of laboratories against ISO 17025, are not included in Ghanaian Standards for export.

- (3) The Ghana Standards 60:1990 "Method of sampling of cereals" applied by the inspectors to sample peanut and peanut products intended for export to the EU for the purpose of testing for aflatoxins is not in line with or equivalent to the requirements of Regulation (EC) No 401/2006 as regards to sampling frequency.

6.2. Competent authorities

- (4) The competent authorities are clearly defined.
- (5) There is no cooperation between CAs.
- (6) Enforcement in the case of infringements of the Ghanaian legislation with regard export of consignments is not carried out.
- (7) There are some recommendations available for farmers with regard to the GAP. However, no standards or comprehensive guidelines have been developed by the MOFA.
- (8) GSB and PPRSD staff training with regard to official control of export of peanut and peanut product consignments is not sufficient.
- (9) Some research is ongoing, but the practical outcome of this research was not demonstrated to the mission team.

6.3. Process controls in the peanut production chain

- (10) The nature of peanut production and the absence of appropriate implementation of agricultural practices to minimise fungal infection and insect damage make peanuts more susceptible to fungal infection and can lead to aflatoxin production. Most of the requirements set out in point 3 of the Codex Alimentarius "Code of practice for the prevention and reduction of aflatoxin contamination in peanuts - CAC/RCP 55-2004" are not implemented.
- (11) Most peanut processors exporting to the EU are not subjected to any official control by the GSB.
- (12) The storage conditions and facilities visited are not in compliance with the requirements of point 3.5 of the Codex Alimentarius "Code of practice for the prevention and reduction of aflatoxin contamination in peanuts" and Regulation (EC) No 852/2004, Annex I and Chapters I and II of Annex II.
- (13) The hygiene conditions of traditional peanut butter processing were not in compliance with the requirements set out in Annex II to Regulation (EC) No 852/2004.
- (14) In both companies visited, some deficiencies were noted with regard to the general requirements for food premises as established in Chapter I and II, Annex II to Regulation (EC) No 852/2004 and with points 46-48 of the Codex Alimentarius "Code of practice for the prevention and reduction of aflatoxin contamination in peanuts"

- (15) None of the peanuts processors visited had implemented GMP or established a system of control based on HACCP principles as required by Article 10 together with Article 5 of Regulation (EC) No 852/2004.
- (16) Traceability, linking final products to the grower/district of production, is not possible.

6.4. Method of sampling for peanut consignments

- (17) The sampling procedure followed is not in compliance with or at least equivalent to the requirements of Regulation (EC) No 401/2006.

6.5. Procedure for exporting nuts to the EU

- (18) The system in place to control aflatoxin contamination in processed peanuts intended for export to the EU in most cases is not applied. There is no system in place for raw peanuts. In consequence, the export of most of peanut and peanut product consignments to the EU takes place without official control.
- (19) Certification of export consignments in line with national requirements, when issued, is not reliable as sampling and analysis are inadequate.
- (20) The relevant CAs have planned to establish a new export procedure, which is scheduled to be in place in November 2007. Communication on the new export procedure still needs to be improved within and between the different CAs.
- (21) The mission team noted that consignments of peanuts and peanut products exported from Accra airport to the EU are not properly identified. This could compromise the correct identification of the item at the country of destination.

6.6. Laboratory services

- (22) Although at the moment there is only one laboratory carrying out official analyses of aflatoxins in peanuts, there are plans to include two additional laboratories in the future.
- (23) At FRI, the analysis of aflatoxins is not included in the scope of accreditation. The laboratory has not yet initiated the necessary accreditation procedures on this regard and does not provide the necessary guarantees that quality control schemes for the analyses of aflatoxins are in place. This is not in accordance with Article 12(2) of Regulation (EC) No 882/2004 and Article 18 of Regulation (EC) No 2076/2005.
- (24) The method of analysis used did not comply with the criteria of Section 4.3.1, Annex II to Regulation (EC) No 401/2006 or the criteria set out in Annex III to Regulation (EC) No 882/2004.

- (25) The equipment for grinding samples is not suited to preparing samples taken from large consignments pursuant to Annex I.D of Regulation (EC) No 401/2006.
- (26) The analytical certificates issued by the FRI laboratory were not in line with the requirements of section 4.4, Annex II of Regulation (EC) No 401/2006 regarding the reporting of recovery and measurement of uncertainty.
- (27) The 2 laboratories that are to be included for the analysis of aflatoxins are currently not able to comply with Article 12(2) of Regulation (EC) No 882/2004 and Article 18 of Regulation (EC) No 2076/2005.

6.7. Response to RASFF notifications

- (28) There has been no RASFF follow-up to date.

6.8. Overall conclusion

- (29) The system in place to control aflatoxin contamination in processed peanuts intended for export to the EU is not applied in most of the cases. No system is in place for raw peanuts. Further shortcomings were found with regard to cooperation with the relevant CAs, sampling, laboratory performance, traceability, identification of exported consignments, RASFF follow-up, GAP, GMP and HACCP implementation. Therefore it cannot be ensured that peanuts exported to EU comply with or are at least equivalent to the relevant requirements as regards aflatoxin. A new export procedure is being drafted and laboratory capability is planned to be increased. However, laboratories will not be in line with EU requirements until a later stage.

7. CLOSING MEETING

A closing meeting was held on 20 September 2007 at the premises of the GSB. Representatives from the GSB, FDB, GEPC, CEPS and CSIR were present. At this meeting, the main observations and initial conclusions were presented by the mission team. The representatives of the competent authorities made initial comments and provisionally accepted the preliminary findings.

8. RECOMMENDATIONS

The Competent Authorities of Ghana should:

- (1) Ensure that an export control system is developed for raw peanuts and ensure that the current export control system for processed peanuts is fully applied, to guarantee that exported consignments to the European Union are in line with EU standards regarding aflatoxins as specified in Regulation (EC) No 1881/2006.

- (2) Improve cooperation between the Competent Authorities involved to ensure that consignments of peanuts and peanut products intended for export to the EU are adequately monitored and identified.
- (3) Ensure that sampling of consignments of peanuts and peanut products for the analysis of aflatoxins is carried out in accordance or at least equivalent the standards set out in Regulation (EC) No 401/2006.
- (4) Ensure that food business operators exporting peanuts and peanut products to the EU implement standards at least equivalent to Article 5 of Regulation (EC) No 852/2004 on food safety procedures based on HACCP principles.
- (5) Consider that the traceability of the exported lot is established in line with Article 18 of Regulation (EC) No 178/2002.
- (6) Consider that officials responsible for official control receive appropriate training for their area of competence.
- (7) Ensure that storage and processing activities and facilities are in line with the requirements of the Codex Alimentarius "Code of practice for the prevention and reduction of Aflatoxin contamination in peanuts" and Regulation (EC) No 852/2004, Annex I and II.
- (8) Ensure that all laboratories undertaking official control analysis for aflatoxins make the necessary arrangements to extend the scope of their accreditation, in line with Article 12 of Regulation (EC) No 882/2004 and Article 18 of Regulation (EC) No 2076/2005.
- (9) Ensure that the laboratory has the necessary equipment for grinding samples taken from large consignments in line with Annex I.D of Regulation (EC) No 401/2006.
- (10) Ensure that the method of analysis used for aflatoxins in peanuts and peanut products includes the criteria, or equivalent to the criteria set out in Annex III to Regulation (EC) No 882/2004 and criteria of Annex II to Regulation (EC) No 401/2006.
- (11) Ensure that recovery and measurement of uncertainty in the analytical reports are reported in line with Regulation (EC) No 401/2006.
- (12) Consider systematic follow-up of notifications issued within the European Union Rapid Alert System for Food and Feed involving peanuts and peanut products from Ghana.
- (13) Consider the possibility of developing and implementing GAP and GMP standards in the area of peanut cultivation and processing.

9. COMPETENT AUTHORITY RESPONSE TO RECOMMENDATIONS

The competent authority's response to the recommendations can be found at:

http://ec.europa.eu/comm/food/fvo/ap/ap_ghana_7198_2007.pdf

as soon as this report is published.

ANNEX 1

European Legislation	Official Journal	Title
Regulation (EC) No 882/2004.	OJ L 165, 30.4.2004. Corrected and republished in OJ L 191, 28.5.2004, p. 1.	Regulation (EC) No 882/2004 of the European Parliament and of the Council of 29 April 2004 on official controls performed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules.
Commission Regulation (EC) No 2076/2005	OJ L 338, 22.12.2005 p. 83.	Commission Regulation (EC) No 2076/2005 of 5 December 2005 laying down transitional arrangements for the implementation of Regulations (EC) No 853/2004, (EC) No 854/2004 and (EC) No 882/2004 of the European Parliament and the Council and amending Regulations (EC) No 853/2004 and (EC) No 854/2004.
Regulation (EC) No 852/2004	OJ L 139, 30.4.2004. Corrected and republished in OJ L 226, 25.6.2004, p. 3.	Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs.
Regulation (EC) No 178/2002.	OJ L 31, 1.2.2002, p. 1.	Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety.
Council Regulation (EEC) No 315/93.	OJ L 37, 13.2.1993, p. 1.	Council Regulation (EEC) No 315/93 of 8 February 1993 laying down Community procedures for contaminants in food.
Commission Regulation (EC) No 1881/2006.	OJ L 364, 20.12.2006, p. 5.	Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs.
Commission Regulation (EC) No 401/2006.	OJ L 70, 9.3.2006, p. 12.	Commission Regulation (EC) No 401/2006 of 23 February 2006 laying down the methods of sampling and analysis for the official control of the levels of mycotoxins in foodstuffs.