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FINAL REPORT OF A MISSION
CARRIED OUT IN
TURKEY
FROM 14 OCTOBER TO 23 OCTOBER 2008
IN ORDER TO
ASSESS THE CONTROL SYSTEMS IN PLACE TO PREVENT MYCOTOXIN
CONTAMINATION IN HAZELNUTS, PISTACHIOS AND DRIED FRUIT
INTENDED FOR EXPORT TO THE EUROPEAN UNION

*Please note that factual errors in the draft report have been corrected in response to comments by the
Competent Authority.*

Executive Summary

This report describes the outcome of a mission carried out by the Food and Veterinary Office (FVO) in Turkey from 14 to 23 October 2008.

The objective was to evaluate the facilities and measures in place to control mycotoxin contamination in hazelnuts, pistachios and dried fruit intended for export to the European Union (EU). Additionally, the mission team followed up on action taken by the Competent Authorities (CAs) in response to the recommendations made by the FVO in report SANCO 8101/2006.

Amendments have been made to existing legislation since the last mission to meet EU requirements on sampling, on maximum limits for Ochratoxin A (OTA) and on HACCP principles.

Clear distribution of responsibilities and adequate communication between the relevant Competent Authorities (CAs) were seen. Staff are frequently trained and are well aware of the legislation requirements.

Training and advice is given on good agricultural practice. Research has been undertaken on reduction of mycotoxins in dried fruit and hazelnuts.

Measures have been implemented to prevent and reduce mycotoxin contamination. However, deficiencies mainly concerning the drying and storage of nuts and dried fruit were observed which were not in accordance with the relevant Codes of Practice for the Prevention and Reduction of Aflatoxin. Problems with regard to traceability back to the farmer were also identified.

The sampling procedures observed during the mission were in line with Commission Regulation (EC) No 401/2006.

Customs checks at the point of export did not require health certificates for certain CN codes included in Commission Decision 2006/504/EC.

Improvements have been made on accreditation of laboratories and analytical performance. However, no National Reference Laboratory has been established.

RASFF notifications are follow-up adequately by the competent authorities.

Overall, the CAs, together with the nuts and dried fruit sector, have made big efforts to control mycotoxin formation by implementing measures at all levels. Furthermore, most of the recommendations of the previous mission report have been addressed. However, the mission team found some shortcomings, mainly in drying and storage at farm level that could have an impact on mycotoxin formation.

The report makes a number of recommendations to the Competent Authorities of Turkey to address the deficiencies noted.

TABLE OF CONTENTS

1	INTRODUCTION.....	1
2	OBJECTIVES OF THE MISSION.....	1
3	LEGAL BASIS FOR THE MISSION.....	3
4	BACKGROUND.....	3
4.1	Overview of previous missions regarding aflatoxin contamination in foodstuffs	3
4.2	Background to the present mission.....	3
4.3	Food product information relating to public health issues.....	5
5	MAIN FINDINGS.....	6
5.1	Relevant national legislation.....	6
5.2	Competent Authorities.....	6
5.2.1	<i>General-Directorate of Protection and Control (GDPC)</i>	7
5.2.2	<i>Customs authorities</i>	7
5.2.3	<i>Other organisations</i>	7
5.3	Process Controls in the nut production chain.....	8
5.3.1	<i>Nut cultivation</i>	9
5.3.2	<i>Fruit cultivation</i>	10
5.3.3	<i>Nut and dried fruit processors visited</i>	11
5.4	Method of sampling for nut consignments.....	12
5.4.1	<i>Sampling procedure</i>	12
5.5	Procedure for exporting nuts to the EU	12
5.6	Laboratory services	13
5.6.1	<i>Laboratories visited</i>	14
5.7	Response to RASFF notifications.....	17
5.8	Follow-up to mission 8101/2006.....	17
6	CONCLUSIONS.....	18
6.1	Relevant national legislation.....	18
6.2	Competent authorities.....	18
6.3	Process controls in the nut production chain.....	18
6.4	Method of sampling for nut consignments.....	19
6.5	Procedure for exporting nuts to the EU	19
6.6	Laboratory services.....	19
6.7	Response to RASFF notifications.....	20

6.8 Follow-up to mission 8101/2006.....	20
6.9 Overall conclusion.....	20
7 CLOSING MEETING.....	20
8 RECOMMENDATIONS.....	21

ABBREVIATIONS & SPECIAL TERMS USED IN THE REPORT

Abbreviation	Explanation
AEA	Agean Exporters Association
AMC	Aflatoxin Monitoring Comitee
AOAC	Association of Analytical Communities
BGYF	Bright Greenish Yellow Fluorescence
BILGE	Customs Computer System
CA	Competent Authority
CCA	Central Competent Authority
CN	Combined Nomenclature
CRM	Certified Reference Material
DAP	Deutsches Akkreditierungssystem Prüfwesen GmbH (German accreditation body)
EU	European Union
FAPAS	Food Analysis Performance Assessment Scheme, UK
FBO	Food Business Operator
FVO	Food and Veterinary Office
GAP	Good Agricultural Practice
GDPC	General-Directorate of Protection and Control
HACCP	Hazard Analysis and Critical Control Points
HPLC	High Performance Liquid Chromatography
IAC	Immuno-Affinity Column
ISO	International Organisation for Standardization
LOD	Limit of Detection
LOQ	Limit of Quantification
MARA	Ministry of Agriculture and Rural Affairs
MS	Member States
OJ	Official Journal of the European Union

Abbreviation	Explanation
OTA	Ochratoxin A
PADs	Provincial Agricultural Directorates
PCL	Provincial Control Laboratory
RASFF	Rapid Alert System for Food and Feed
SANCO	Health and Consumers Directorate - General
SOP	Standard Operating Procedure
TÜBİTAK	Scientific and Technical Research Council of Turkey
TURKAK	Turkish Accreditation Body
UFT	Undersecretariat for Foreign Trade

1 INTRODUCTION

The mission took place in Turkey from 14 to 23 October 2008. The mission team comprised two inspectors from the Food and Veterinary Office (FVO) and a Member State expert.

The mission was undertaken as part of the FVO's planned mission programme.

The inspection team was accompanied during mission by representatives from the Central Competent Authorities (CCA), the General-Directorate for Protection and Control (GDPC) in the Ministry of Agriculture and Rural Affairs (MARA), and from the Undersecretariat for Foreign Trade (UFT).

An opening meeting was held on 14 October 2008 with the CCA, the GDPC. Representatives of the General-Directorate for Support and Organisation, the UFT, the General-Directorate for Agricultural Research, the Undersecretariat for Customs and the European Union (EU) Delegation in Turkey were also present.

During this meeting, the objectives of and itinerary for the mission were finalised and confirmed by the mission team.

2 OBJECTIVES OF THE MISSION

The objective of the mission was to evaluate, in the context of the import controls on food and feed of non-animal origin:

- To verify whether the control systems are in place to control mycotoxin contamination in hazelnuts, pistachios and dried fruit intended for export to the EU within the specified EU contaminant limits, complying with or being at least equivalent to Commission Regulation (EC) No 1881/2006.

Additionally, the mission team followed up on action taken by the Competent Authorities (CAs) in response to recommendations made by the FVO in the previous report DG (SANCO)/ 8101/2006.

To achieve these objectives, the following visits were carried out in accordance with the itinerary agreed between the GDPC and the FVO.

Competent Authority visits			Comments
Competent Authority	Central	2	GDPC and UFT
	Provincial	1	Trabzon Provincial Agricultural Directorate (PAD)
		1	Ordu PAD
		1	Aydin PAD
		1	Gaziantep PAD
		Customs office of Gemlik port	
Laboratory visits		4	
Public laboratories		1	Trabzon PCL
		1	Gaziantep PCL
Private approved laboratories		1	Private laboratory in Izmir
		1	Private laboratory in Gaziantep (only sample preparation)
Farmers			
Fig orchard		1	Aydin
Hazelnut orchard		1	Ordu
Vineyard		1	Manisa
Processing establishments			
Hazelnut processor/exporter		2	Trabzon and Ordu
Dried fig processor/exporter		2	Aydin and Izmir
Dried fig Wholesaler		1	Aydin
Dried vine fruit processor/exporter		1	Manisa
Pistachio processor/exporter		2	Gaziantep
Ports of export			
Bursa		1	Gemlik port
Other sites			
Undersecretariat for Foreign Trade		1	Presentation of

		research results on dry figs by Ege University
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3 LEGAL BASIS FOR THE MISSION

The mission was carried out in agreement with the MARA 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.

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

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, Brazil, India, the USA, Argentina and Ghana with the objective of evaluating official control systems for the prevention of aflatoxin contamination in foodstuffs originating from those countries. In addition, missions to assess controls on imported products of plant origin have been carried out in 18 Member States (MS): Austria, Belgium, Bulgaria, the Czech Republic, France, Germany, Greece, Hungary, Italy, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, the Slovak Republic, Spain and the UK. The reports on these missions are available on the DG Health and Consumers website at: http://europa.eu.int/comm/food/fvo/index_en.htm.

4.2 BACKGROUND TO THE PRESENT MISSION

Turkey's total national production in 2007 was 530 000 tonnes of hazelnuts, 73 416 tonnes of pistachios, 210 152 tonnes of figs and 882 940 tonnes of grapes.

Information on foodstuffs found to have public health implications is disseminated as notifications via the Rapid Alert System for Food and Feed (RASFF) to all MS and to the exporting country. From 2006 to the time of the mission a number of notifications relating to mycotoxins in hazelnuts, dried figs, pistachios and derived products from Turkey had been informed via the RASFF. The break-down of these notifications from 2006 to 2008 and the volume of imports into the EU are shown in Table 1. The main importing MS are indicated in brackets.

Table 1 : Imports of hazelnuts, pistachios, dried figs and dried grapes into the EU

TURKEY	Imports into the EU (tonnes)		Number of RASFF notifications		
	2006	2007	2006	2007	2008 (up to 10 Oct.)
In-shell hazelnuts (CN code 0802 21 00) Shelled hazelnuts (CN code 0802 22 00)	81 827 (DE, IT, EL)	79 367 (DE, IT, DK)	79	104	40
Pistachios (CN code 0802 50 00)	658 (IT, DE, UK)	873 (IT, DE, UK)	23	33	13
Dried figs (CN code 0804 20 90)	37 968 (FR, DE, IT)	29 011 (DE, FR, UK)	54	61	60 (including fig paste)
Dried grapes (CN code 0806 20 00)	198 541 (UK, DE, NL)	205 142 (UK, NL, DE)	1	2	0

Source: Eurostat database and EC RASFF database

Table 2 : Frequency of controls at import by MS for hazelnuts, pistachios, dried figs and dried grapes

	Year	Num. of consign. analysed	Num. of consign. compliant	Num. of consign. non-compliant	% of compliance	% of non-compliance	RASFF
DRIED FIGS	2006	378	331	47	88	12	54
	2007	298	250	48	84	16	59
	2008	61	52	9	85	15	49
HAZELNUTS	2006	728	656	72	90	10	79
	2007	489	423	66	86	14	104
	2008	143	131	12	92	8	32
PISTACHIOS	2006	45	33	12	73	27	21
	2007	78	62	16	79	21	33
	2008	16	12	4	75	25	10

Source: SANCO E3 and MS reports.

In view of the increasing number of notifications, the FVO decided to undertake a mission with the objectives set out above and to follow up of the recommendations made in report DG (SANCO) 8101/2006.

4.3 FOOD PRODUCT INFORMATION RELATING 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) in food and the aflatoxin B1 content. Maximum limits for aflatoxins in food have been set in legislation, taking into account the known possible effects of sorting, mixing or other physical treatment to reduce the aflatoxin content of peanuts. Under Annex I to Regulation (EC) No 1881/2006, the maximum admissible aflatoxin levels in groundnuts, nuts and dried fruit 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 µg/kg aflatoxin B1 content; and
4 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 µg/kg aflatoxin B1 content; and

15 µg/kg total aflatoxin content.

c) Nuts and dried fruit to be subjected to sorting, or other physical treatment, before human consumption or use as an ingredient in foodstuffs:

5 µg/kg aflatoxin B1 content; and

10 µg/kg total aflatoxin content.

Ochratoxin A (OTA) is a mycotoxin produced by several fungi (*Penicillium* and *Aspergillus* species) and occurs naturally in a variety of plant products such as cereals, coffee beans, beans, pulses and dried fruit all over the world. Investigations on the frequency and levels of occurrence of OTA in food indicate that foodstuffs are frequently contaminated. Maximum limits for OTA in food have been set in legislation.

Under Regulation (EC) No 1881/2006, the maximum level for OTA in dried vine fruits (currants, raisins and sultanas) is 10 µg/kg.

Sampling also plays a crucial part in determining mycotoxin levels, which are very heterogeneously distributed in any consignment. Therefore, Commission Regulation (EC) No 401/2006 established sampling procedures and general criteria to ensure that laboratories conducting the analysis use methods giving comparable levels of performance.

5 MAIN FINDINGS

5.1 RELEVANT NATIONAL LEGISLATION

Turkey's national legislation has been updated as follows since the last mission:

The Turkish Food Codex Communiqué No 2008/26 concerning Maximum Limits for Contaminants in Food lays down national maximum limits for OTA in dried vine fruit (10 ppb) which are equivalent to the EU limits. The national limits for aflatoxin in hazelnuts, pistachios and dried fruit (5 ppb for B1 and 10 ppb for total aflatoxins) have not changed since the last mission.

The Turkish Food Codex Communiqué No 2007/21 on the Criteria for Sampling, Sample Preparation, and Method of Analysis for the Official Control of the Level of Mycotoxins in Foodstuffs includes the sampling requirements of Regulation (EC) No 401/2006.

Regulation No 27009 on Inspection and Control of Food Safety and Quality (26/9/2008) lays down principles and procedures for food inspection. In particular, Article 8 requires food business operators (FBO) to implement and maintain procedures based on HACCP principles.

5.2 COMPETENT AUTHORITIES

There have been no changes concerning structure and responsibilities of the relevant CAs since the last mission.

5.2.1 General-Directorate of Protection and Control (GDPC)

The CCA is the GDPC in the MARA, responsible for issuing legislation and co-ordinating the PADs. Official controls of foodstuffs are implemented by 81 Provincial Control Divisions within the individual PADs. Provincial Control Divisions are responsible for controls on exports and imports and for monitoring foodstuffs, including inspections of premises dealing with nuts and dried fruit. 27 of the 81 PADs are authorised to issue health certificates for products subject to Commission Decision 2006/504/EC. All consignments of hazelnuts, pistachios and dried figs to be exported to the EU are sampled and analysed for aflatoxins. Health certificates are then issued accordingly. In the case of dried vine fruit they are analysed for OTA.

The mission team saw evidence of communication between the GDPC and the PADs visited such as, legislation and instructions in relation to official control activities, including export procedures for products subject to Decision 2006/504/EC.

Comprehensive information concerning in-service training was provided to the mission team, such as on new legislation and instructions, HACCP systems, the RASFF system, sampling and risk-based inspection, and import controls. The mission team examined the training files of the relevant inspectors and laboratory staff in the regions visited. Evidence of assistance to relevant training sessions was seen.

The Inspection Board Head Office within the MARA is responsible for auditing the food inspection authorities. The audits include food inspections and certification within the scope of this mission. Reports on these audits are not published. The mission team requested evidence of these audit reports, but these were not provided by the CAs.

Training for farmers on good agricultural practices (GAP) is organised at PAD level and coordinated by the General-Directorate for Support and Organisation.

The mission team was informed that a small percentage of hazelnut and pistachio farmers are not registered by the relevant PAD and, consequently, receive no training or advice. However, it was stated that they supply only the domestic market.

5.2.2 Customs authorities

There have been no changes in the structure and responsibilities since the last mission.

The mission team visited the Gemlik Customs Directorate which is under the Bursa Regional Customs Directorate. This local directorate is based in Gemlik port, from which approximately 3300 hazelnut consignments were shipped to the EU between January 2007 and October 2008.

5.2.3 Other organisations

UFT is under the Prime Minister and is responsible for carrying out quality controls on the basis of product standards. Exporters' associations are under the umbrella of the UFT. All exporters must be members of an exporters' association to be entitled to export. Furthermore, the UFT is a member of the Aflatoxin Monitoring Committee (AMC).

The AMC was established on the initiative of the Aegean Exporters Association (AEA) in order to evaluate the efficiency of the aflatoxin prevention procedures. The Committee members are from the AEA, Ege University and the regional office of the UFT. The AMC controls all fig processors in the region, at least twice during each season and has made available a list of minimum requirements such as traceability, management of aflatoxin control, requirements for the dark rooms for bright greenish yellow fluorescence (BGYF) screening and UV control.

Ege University carries out continuous research on mycotoxin contamination on figs. In collaboration with the AEA, the UFT and the relevant PADs, has organised several training activities on mould and mycotoxins risk, conditions favouring aflatoxigenic fungi and preventive measures to be applied in fig orchards. Several publications containing GAP are available to farmers and equipment, such as caprification bags, drying tray nets, trays and traps for pests has been distributed by the Association and the relevant PAD.

The mission team met representatives of the Scientific and Technical Research Council of Turkey (TÜBİTAK). TÜBİTAK acts as an advisory agency to the Turkish Government on science and research issues. Three research projects on hazelnuts have been carried out, one on determination of the factors affecting the levels of aflatoxins, another on sampling for aflatoxin analysis and the last on the effect of further processing (roasting, blanching and sorting) on reduction of aflatoxin contamination.

5.3 PROCESS CONTROLS IN THE NUT PRODUCTION CHAIN

In relation to mycotoxin contamination, inspections including sampling are carried out as part of the National Aflatoxin Monitoring Project in provinces where production and exports of hazelnuts, pistachios and dried fruit are high. The sampling programme is established every year at GDPC level with the involvement of the Domestic Food Control and Nutrition Section and the relevant laboratories. Samples are taken by food inspectors, 80% from retailers and 20% from producers after harvesting. Sampling frequency and regional distribution depend on production volumes, the harvesting and export season, export activity and previous results.

Concerning aflatoxin and OTA contamination, 766 samples (hazelnuts, pistachios, dried figs and dried vine fruit) were taken in 2007, of which 28 were non-compliant (3.6%). In 2008, 698 samples were taken, of which 27 were non-compliant (3.8%). The percentage on non-compliant samples is similar in both years but higher than in 2005 (1.5% according the data provided in the previous report).

In addition, the "Domestic Inspection Programme", prepared at provincial level, covers different hazards in all kinds of foodstuffs including mycotoxin analysis in nuts and dried fruit.

A fig monitoring programme carried out by the AMC is in place. Random samples of figs are taken from all processors twice a year to monitor yearly aflatoxin incidence in Izmir and Aydin.

5.3.1 Nut cultivation

The main hazelnut-growing areas in Turkey are the eastern Black Sea and Duzce regions. The level of production in 2007 was 530 000 tonnes, of which approximately 15% were imported into the EU. The main export ports are Trabzon and Gemlik.

The mission team visited the Black Sea region which accounts for the majority of production and exports to the EU. In the region visited, hazelnut farmers generally own small orchards with low volumes of production. All hazelnuts are purchased either by "middlemen" or by a State agent who, in turn, sells them on to the processing plants for either cracking or processing.

Traceability is possible up to the middleman but not back to the individual farmer as recommended in point 33 of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Tree Nuts (CAC/RCP 59-2005, REV: 1-2006).

A 4.1 hectare hazelnut orchard with a production of around 8 tonnes a year was visited. The farmer said that he regularly receives guidance on GAP from the PAD intended to avoid aflatoxin contamination in hazelnuts at various stages of growing, harvesting and storage (by means of meetings, announcements on loudspeakers in villages, TV, radio, SMS etc.).

Harvesting takes place from July to September. Hazelnuts can be harvested by picking the nuts from branches or off the ground. They are then pre-dried in the sun until their cover leaves turn brown. After this initial drying process, the hazelnuts are separated from their cover leaves and then left on the covered floor where the main sun-drying process takes place. The hazelnuts are protected from the rain by plastic covers. Depending on the weather conditions, the total drying span, including the pre-drying process, takes one week. The sun-drying process finishes when the farmer considers that the hazelnuts are dry enough after breaking the kernels with the fingers. The hazelnuts are then sorted.

The mission team noted that no instrument is used to determine the level of moisture as recommended in points 35 and 36 of the abovementioned Code of Practice.

In this particular farm, the mission team was informed that hazelnuts could be stored for at least four months before being sold. This depends on the market prices and on the date of the appointment with the State agent who buys the products on behalf of the government to keep market prices. The farmer visited had an appointment with the State agent on 24 December 2008. Hazelnuts stored were not properly insulated from the floor to avoid moisture build up and were not sufficiently protected against insects, birds or rodents as recommended in point 45 of the relevant Code of Practice.

The main pistachio growing area is Gaziantep and the main port of export is Mersin. The Gaziantep PAD was visited by the mission team.

With few exceptions, pistachio orchards are generally small and with low volumes of production. Pistachios are purchased directly by the processors or middlemen. The mission team was informed that traceability back to the farmer is possible. Registered farmers are frequently advised about GAP.

Harvesting takes place between August and September. The mission team was informed that, in the past, pistachios used to be sun-dried with the hull by the farmers and bought by the processors when they were dry. They were then cracked or de-hulled by re-wetting. Currently, a new system is being introduced where pistachios are no longer sun-dried by the farmer, but are collected by the processor immediately after harvesting. At the processing facilities the pistachios are de-hulled, dried and/or cracked and roasted.

Concerning table 2 (page 8), the CAs from the Gaziantep PAD informed the mission team that the rejection rate for pistachios indicated cannot be considered as valid statistically because it is calculated over a small sample of consignments which is not representative enough. There is a difference in varieties with Siirit/Antep being more frequently contaminated than Gaziantep. It was also pointed out that in 2007, the volume rejected at EU level represented approximately 3 % of the total volume exported and that this percentage is lower than in previous years.

5.3.2 Fruit cultivation

The main fig growing and fig drying areas are around Izmir and Aydin provinces which account for 66% of the total production (139 121 tonnes of fresh figs). The main port of export is Izmir.

In the region visited, fig farmers generally own small orchards with low volumes of production. Around 50% of figs are purchased directly by the processors and the other 50% by middlemen or by a State agent who in turn sells them on to the processors. The mission team was informed that traceability back to the farmer is possible. Irrigation is not possible in the production area.

Climate change has had an influence on the fig production. Draught, irregular precipitations, very high temperatures, humidity levels and their influence on the soil composition have halved the production and triggered the aflatoxin formation. These adverse climate conditions have caused 50% losses for the last two years which have affected the quality of the figs and caused problems with aflatoxins.

A 15-hectare fig orchard was visited by the mission team in Aydin. The farmer explained that caprification bags are used and collected after 10 to 15 days when pollination has finished. Harvesting takes place in August and September.

Figs are harvested manually by picking them from the ground twice a day and they are sun-dried in drying beds protected from the rain. The sun-drying process finishes when the farmer considers that the figs are dry enough, based on manual and visual checks. Subsequently, the figs are sorted, collected in crates or trays, fumigated and stored until being sold or immediately collected by the processor or middleman.

The mission team observed that no instrument is used to determine the level of moisture and water activity at farm or middleman level as recommended by points 38 and 43 of the Code of Practice for the Prevention and Reduction of Aflatoxin contamination in dried figs (ALINORM 08/31/41 Appendix XI).

The farmer visited has his own interim store which was empty at the time of the visit. The storage time could vary from a few to forty days.

The mission team observed that the facilities were built with adequate materials but did not allow optimum storage conditions for dried figs at temperatures of 5 to 10C and relative humidity less than 65% as recommended in point 46 of the Code of Practice above-mentioned.

Grape farms are generally small with low volumes of production. Grapes are purchased directly by the processors or middlemen. Traceability back to the farmer is possible.

A 20-hectares vineyard with an average production of 110 tonnes of grapes a year was visited by the mission team in Manisa. The farmer described the production system as follows: grapes are sun-dried after harvesting (which starts at the end of August) on a sheet spread over the ground. The sun-drying process lasts 7 or 8 days. Subsequently, the grapes are stored for a period that could last 6 to 7 months.

The mission team noted that grapes are not protected against the rain during sun-drying. The storage facility visited was not sufficiently protected against pests; Sacks containing dried grapes were stored in high piles against the walls, which could cause heat built-up and moisture accumulation. Facilities were not kept in good repair and hygiene conditions were not adequate (Regulation (EC) No 852/2004, part A, point 15 Annex I).

5.3.3 Nut and dried fruit processors visited

The mission team visited eight food premises (1 warehouse and 7 companies exporting and processing nuts and dried fruits) and also examined inspection procedures there. All the companies were subjected to a systematic documented inspection and 6 out of 7 processing companies have food safety procedures based on HACCP principles. The other one has recently moved to new premises and it is in the process implementing these. In addition, 4 out of the 7 have their own laboratories for auto-control purposes. All the companies visited had been notified by the RASFF system and investigations had been undertaken by the PAD. Evidence of these visits was shown to the mission team.

At the hazelnut processors visited, in-house checks were performed on moisture, rotten mouldy level and mycotoxin analysis at reception and in the final product. In the process, hazelnuts were sorted and handpicked to remove damaged and mould- affected kernels.

At the fig processors visited, in-house checks were regularly performed on moisture and BGYF for aflatoxins at reception. During the process, occurrence of potential OTA producers was checked by visually identifying figs affected by black *Aspergillus*. Moisture content and aflatoxin screening were carried out on the final product.

The mission team noticed that the moisture content was checked after the washing step, at the end of the process. An example of checks examined showed that the initial

moisture content was 18% and 21% after washing. However, this figure represented an average of the whole fig and point 51 of the Code of Practice recommends re-drying again after this washing step. Facilities for such drying were available but not generally used.

At the dried grape processor visited, incoming products were checked for moisture level and mouldy level. Moisture content determination was carried out in the final product.

At the Pistachios processors visited, visual controls were carried out on each lot at reception. In one of the establishments, it was noticed that at reception, the level of moisture was not determined as recommended in points 35 and 36 of the Code of Practice for tree nuts. Moreover, determination of aflatoxin levels and moisture content before products are released from the processing facilities is not carried out as recommended by point 42 of the Code of Practice for tree nuts.

One of the pistachio processors had an optical sorting system using a modern laser technique.

5.4 METHOD OF SAMPLING FOR NUT CONSIGNMENTS

5.4.1 Sampling procedure

Sampling procedures are described in Turkish Food Codex Communiqué No 2007/21 on the Criteria for Sampling, Sample Preparation and Method of Analysis for the Official Control of the Level of Mycotoxins in Foodstuffs.

The mission team evaluated two sampling demonstrations, one for a consignment of dried figs, the other for a consignment of hazelnuts.

The net weight of the consignment of figs was 2 000 kg. Staff from the PAD took 40 incremental samples of 300 g each from 40 selected boxes to produce an aggregate sample of 12 kg. This was then, divided into two equal parts of 6 kg each. The two subsamples were taken to the laboratory, ground and then re-divided into 2 subgroups as A1-A2, B1-B2. Samples from each sub-group were separated, labelled and sealed. Sample A1-B1 was kept for analysis and the replicate sample (A2-B2) was kept in a cold storage on the premises of the PAD.

The net weight of the consignment of hazelnuts was 10 000 kg. Staff took 80 incremental samples of 300 g each from 80 selected sacks to produce an aggregate sample of 24 kg which was mixed, labelled and sealed and taken to the laboratory. This was then divided into three equal parts of 8 kg each, ground and then re-divided into 2 subgroups (A1-A2, B1-B2 and C1-C2). Samples from each sub-group were separated, labelled and sealed. Sample A1-B1-C1 is sent to the laboratory. A replicate sample A2-B2-C2 is kept on the premises of the PAD.

5.5 PROCEDURE FOR EXPORTING NUTS TO THE EU

The export procedure starts when a customs declaration is lodged with the Customs

office either by a legal person on behalf of the exporter or by a Customs broker. The customs officers then check the documents presented against the information provided by the exporter in the BILGE system. The mission team was informed that when data referring to a commodity covered by Decision 2006/504/EC is entered in the BILGE system, the system identifies that a health certificate and the relevant analysis report are required before export. Once the documents are presented they are checked against the declaration and the BILGE system then determines on the basis of the type of product, if further checks are needed, such as additional documentation (yellow channel) or identity checks (red channel). Finally, the goods remain in the customs area until they are loaded into the container under customs supervision.

The mission team observed a demonstration of this Customs system in operation and identified that the information available in the system was incomplete, as it did not require health certificates for certain CN codes (e.g. CN code 11063090 for flour, meal and powder of hazelnuts, figs and pistachios and CN code 20079998 for fig paste and hazelnut paste).

A recommendation on this issue was made in the previous report but had not been fully addressed by the time of this mission due to a misunderstanding between the customs and the UFT. After the mission, the UFT informed the mission team that a letter had been sent to the customs authorities informing them about the CN codes to be included in BILGE.

Returned consignments from the EU are considered imports. When products arrive, the exporter notifies the relevant PAD concerned which in turn, takes samples and performs the relevant analysis. If the products comply with the Turkish legislation, the customs authorities release them and they are returned to the exporting company. Foodstuffs over the legal limit, products are not allowed to be released and the exporter is required to declare their final destination.

5.6 LABORATORY SERVICES

More private and public laboratories have been approved since the last mission. 26 PCL and 10 private laboratories are authorised to perform mycotoxin analysis at the moment.

Since the last mission, improvements have been made on accreditation to EN ISO /IEC 17025 either by the Turkish Accreditation Agency (TURKAK) or by the German accreditation body (DAP). Currently, there are 15 PCLs where the method used for analysis of aflatoxins and/or for OTA in nuts and dried fruit is included in the scope of the accreditation. All private laboratories are accredited and the relevant method is included in their accreditation.

The mission team was informed that 23 PCLs participated in proficiency tests during 2007 and 2008.

The previous report stated that a National Reference Laboratory would be set up and would have several responsibilities such as organisation of proficiency testing schemes and training and analysis of replicate samples. However, this laboratory had not yet been established by the time of this mission. Currently, the reference capability is provided

jointly by Ankara, Mersin, Gaziantep and Izmir PCLs.

The mission team visited three authorised laboratories: two PCLs and one private laboratory. Another private laboratory was visited but only to assess the sampling preparation procedure and to follow-up Recommendation number 1 of report SANCO 8101/2008.

5.6.1 Laboratories visited

A summary of the performance of the three laboratories visited is set out in tables 3 and 4 below. Trabzon and Gaziantep are PCLs, whereas Izmir is a private laboratory.

Table 3: Mycotoxin analysis performed in 2007 for export purposes

Laboratory	No of samples for export		Non-compliant	
	2007	2008	2007	2008
Trabzon	6370	3592	139	40
Izmir	963	642	117	129
Gaziantep	100	230	18	10

Source: Laboratories visited

Table 4: Summary of Laboratory performance of the 3 laboratories visited

	Trabazon PCL	Private laboratory Izmir	Gaziantep PCL
Accreditation	By TÜRKAK 16/10/2006 <i>Determination of Aflatoxin B1,B2,G1 and G2 (hazelnuts)</i> <i>AOAC Official Methods 991.31:1994 (modified)</i>	By TÜRKAK 18/06/2008 <i>Determination of Aflatoxin B1,B2,G1 and G2(figs)</i> <i>AOAC 999.07:2005</i> <i>Determination of Ochratoxin A (dried vine fruit)</i> <i>KAL-SOP-098/01 (in-house method*)</i>	By TÜRKAK 16/10/2006 <i>Determination of Aflatoxin B1,B2,G1 and G2(dried fruit, paprika)</i> <i>AOAC Official Methods 999.07:2000</i>
Validation	Validation of LOD, LOQ, precision, linearity, recovery, accuracy etc., including estimation of measurement uncertainty was observed.	Validation of LOD, LOQ, precision, linearity, recovery, accuracy etc., including estimation of measurement uncertainty was observed.	Validation of LOD, LOQ, precision, linearity, recovery, accuracy etc., including estimation of measurement uncertainty was observed.
SOP for method	SOP developed	SOP developed	SOP developed
Premises	Adequate	Adequate	Adequate
Method and equipment	Extraction and IAC clean-up procedure. Determination using HPLC coupled with post-column derivatisation and fluorimetric detection.	Extraction and IAC clean-up procedure. Determination using HPLC coupled with post-column derivatisation and fluorimetric detection for Aflatoxins determination and HPLC with fluorimetric detection for OTA.	Extraction and IAC clean-up procedure. Determination using HPLC coupled with post-column derivatisation and fluorimetric detection.
Quality assurance (references, spikes, etc.)	Laboratory participated in FAPAS and TUBITAK proficiency tests	Laboratory participated in FAPAS with acceptable results.	Laboratory participated in FAPAS with good results.

	with good results. Reference materials (FAPAS) are used for internal control of accuracy and precision. Calibration curve is checked regularly. Control charts are used for assuring the quality of tests	Reference materials (FAPAS) are used for internal control of accuracy and precision. Calibration curve is checked regularly. Control charts are used for assuring the quality of tests	Reference materials (In-house) are used for internal control of accuracy and precision. Calibration curve is checked regularly. Control charts are used for assuring the quality of tests
Analytes	Aflatoxin B1 and total aflatoxins (B1, B2, G1, G2)	Aflatoxin B1 and total aflatoxins (B1, B2, G1, G2) OTA	Aflatoxin B1 and total aflatoxins (B1, B2, G1, G2)
Sample management	Generally adequate (kept in transparent plastic bags)	Generally adequate Homogenisation procedure needs to be checked using natural contaminated sample	Generally adequate
Calibration standards	Certified stock standards obtained from Supelco (aflatoxin mix kit-m)	Certified stock standards obtained from Supelco (aflatoxin mix kit-m)	Certified stock standards obtained from Supelco (aflatoxin mix kit-m).
Recovery (%)	Recovery factors are calculated in accordance with EU legislation and not applied to results but indicated in report	Recovery factors are calculated in accordance with EU legislation and applied to results and indicated in report	Recovery factors are calculated in accordance with EU legislation and applied to results and indicated in report
Calibration Curve	5-point calibration ran weekly and regularly checked on a per-batch basis	5-point calibration ran twice a month and regularly checked on a per-batch basis	7-point calibration ran monthly and regularly checked on a daily basis
LOD and LOQ	LOD and LOQ validation calculated	LOD and LOQ validation calculated	LOD and LOQ validation calculated

	statistically using replicate analysis. LODs and LOQs all below EU limits	statistically using replicate analysis. LODs and LOQs all below EU limits	statistically using replicate analysis. LODs and LOQs all below EU limits
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* McDonald S. et al., 2003: *Journal of AOAC* 86 (6) 2003, 1164 (interlaboratory study).

The analytical reports include information on recovery rate (result corrected or not corrected, depending on the laboratory) and measurement of uncertainty.

Training files with regard to assistance to relevant training sessions by the staff directly involved with the mycotoxins analysis were examined by the mission team in all the laboratories visited.

Samples were usually analysed on the same day that they were brought to the laboratories. Homogenisation of samples was carried out by dry grinding in all the laboratories. Validation reports on homogenisation procedures were examined by the mission team (see sample management section of table 4).

In addition to these three laboratories, the team also made a short visit to a private laboratory in Gaziantep which performed most of the official analyses of pistachios from that province. This laboratory has changed its homogenisation procedure since the last mission and is currently using slurry with water (1:1.5). Results of homogeneity tests were good and have been accurately tested using a natural contaminated sample.

5.7 RESPONSE TO RASFF NOTIFICATIONS

The GDPC receives RASFF notifications from the EC and forwards them to the PAD concerned along with the relevant instructions. Subsequently, the PAD conducts an inspection, sampling and checks on the returned consignment and the outcome is notified to the GDPC.

The mission team selected a number of RASFFs notifications and requested the relevant files in each PADs visited. The food inspectors showed instructions from the GDPC, such as the requirement to check the existence of any product with the same lot number, to inform the other PADs in the event of further distribution, to increase the inspection frequency at the FBO concerned and to take samples, identify the suppliers or farmers and carry out controls and training as necessary. Evidence of such actions was shown to the mission team.

5.8 FOLLOW-UP TO MISSION 8101/2006

The FVO undertook a mission in Turkey in February 2006 to verify the facilities and measures in place to control mycotoxin contamination in foodstuffs, with regard to hazelnuts, pistachios and dried fruits and to verify the facilities and measures in place to control the use of additives in dried fruit. This report made a series of recommendations that required attention by the Turkish authorities.

The recommendations, the response of the Competent Authority and the follow up on current situation are summarised in Annex 2.

6 CONCLUSIONS

6.1 RELEVANT NATIONAL LEGISLATION

- New legislation has been approved since the last mission setting criteria for sampling in line with Regulation (EC) No 401/2006, requiring all FBOs to implement and maintain procedures based on HACCP principles and setting maximum limits on OTA in line with Commission Regulation (EC) 1881/2006.

6.2 COMPETENT AUTHORITIES

- The structure and organisation of the CAs including customs, has not changed since the last mission. Responsibilities are clear and communication is good at all levels.
- Staff met by the mission team were well trained and showed good knowledge of the relevant legislation and instructions.
- The mission team was informed that supervision of the official controls is regularly carried out. However, no evidence was provided to the mission team.

6.3 PROCESS CONTROLS IN THE NUT PRODUCTION CHAIN

- In the area of cultivation, measures have been taken to promote GAP and training of farmers is in progress.
- Several activities and research have been implemented to prevent and reduce aflatoxin and OTA contamination in nuts and dried fruit with the participation of the CAs and other organisations. Necessary equipment has been provided to farmers to facilitate the implementation of GAP.
- As regards mycotoxin contamination controls, there are two national monitoring programmes. In addition, a regional aflatoxin mapping project is in place to determine the level and frequency of aflatoxin contamination in figs.
- Traceability of hazelnuts back to the individual farm is not possible which is not in line with recommendation 33 of the Code of Practice for the Prevention and Reduction of aflatoxin contamination in tree nuts - CAC/RCP 59-2005, REV: 1-2006. CAs stated that traceability back to the individual fig farm is possible.

- Determination of the level of moisture in hazelnuts and dried figs before storage is not adequate and it is not in line with the relevant codes of practices (points 35 and 36 of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Tree nuts and points 38 and 43 of the Code of Practice for the Prevention and Reduction of aflatoxin contamination in dried figs).
- The storage conditions of hazelnuts and dried fruit are not adequate to avoid further re-absorption of moisture leading to fungal growth and formation of mycotoxins as recommended in the relevant codes of practices (point 45 of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Tree nuts and point 46 of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Dried Figs and in Regulation (EC) No 852/2004, part A, point 15 Annex I.
- All the nut and dried fruit processors visited were subject to official control. Most of the companies visited have implemented food safety procedures based on HACCP principles.
- In terms of mycotoxin control, adequate in-house checks were undertaken by the processors with one exception where determination of aflatoxin levels and moisture content was not carried out as recommended in point 42 of the Code of Practice for tree nuts.

6.4 METHOD OF SAMPLING FOR NUT CONSIGNMENTS

- The sampling procedures for hazelnuts and dried figs, which were evaluated, followed the requirements of Commission Regulation (EC) No 401/2006.

6.5 PROCEDURE FOR EXPORTING NUTS TO THE EU

- The control system in place for exported consignments is properly implemented with the exception that Customs does not require health certificates for some products covered by Commission Decision 2006/504/EC (e.g. CN code 11063090 for flour, meal and powder of hazelnuts, figs and pistachios).

6.6 LABORATORY SERVICES

- More laboratories have been authorised since the last mission. Significant improvements have been made with regard to their accreditation. However, 14 out of 26 PCL are still not accredited.
- No National Reference Laboratory has yet been established that would have several responsibilities such as organisation of proficiency testing schemes and training and

analysis of replicate samples.

- The laboratories visited had a good quality management and laboratory performance was adequate.
- Studies of sample homogeneity after sample preparation using repeat analysis were presented to the mission team in the four laboratories visited. Except in one case, the studies were adequate.

6.7 RESPONSE TO RASFF NOTIFICATIONS

- Adequate investigations had been carried out in the companies notified via the RASFF and also on the returned consignments.
- Concerning the analysis of returned consignments adequate communication was observed between the PADs involved.

6.8 FOLLOW-UP TO MISSION 8101/2006

Four recommendations have been fully addressed and three partly addressed with major improvements made in the relevant areas.

6.9 OVERALL CONCLUSION

Overall, Turkey has an adequate set of legislation in place along with a good CA structure and channels of communication to perform official controls. The Turkish exporters of nuts and dried fruit together with the relevant CAs have made big efforts to control mycotoxin formation by implementing measures at all levels. Furthermore, most of the recommendations from the previous mission report have been addressed. However, the mission team found some shortcomings, mainly related to the drying and storage at farm level that could have an impact on mycotoxin formation.

7 CLOSING MEETING

A closing meeting was held on 23 October 2008 with the central competent authority, MARA and the UFT. At this meeting, the main findings and conclusions of the mission were presented by the inspection team.

The representatives of the MARA did not express any disagreement with these findings and conclusions.

8 RECOMMENDATIONS

To the Competent Authorities of Turkey

An action plan in response to the recommendations should be forwarded to the Commission within 25 days of receipt of the report. This action plan should clearly set out the manner and deadline by which the competent authorities will address each of the following recommendations:

No.	Recommendation
1	Consider reinforcing controls at all stages to prevent aflatoxin contamination in hazelnuts, pistachios and dried figs, following the recommendations made in the relevant Codes of Practice (Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Tree Nuts-CAC/RCP 59-2005, REV: 1-2006, in particular points 35, 36, 42 and 45 of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Dried Figs-ALINORM 08/31/41 Appendix XI, in particular points 38, 43 and 46).
2	Ensure that storage facilities for nuts and dried fruit are in line or at least equivalent with the requirements of Regulation (EC) No 852/2004, part A, point 15 Annex I.
3	Ensure that Customs procedures include the control of the health certificate required in all products included in Article 1 of Commission Decision 2006/504/EC.
4	Consider accreditation to ISO 17025 or to extend the scope of accredited approved laboratories to ensure their equivalence with Article 18 of Regulation (EC) No 2076/2005 and that these laboratories provide reliable analytical results. Equivalence to Article 12 (2) of Regulation (EC) No 882/2004 should be demonstrated by January 2010.

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

http://ec.europa.eu/food/fvo/ap/ap_turkey_7858_2008.pdf

ANNEX 1 - LIST OF LEGISLATION REFERENCED IN THE REPORT

Reference	OJ Ref.	Detail
Regulation (EC) No 882/2004	OJ L 165, 30.4.2004, p. 1, Corrected and re-published 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
Regulation (EC) No 852/2004	OJ L 139, 30.4.2004, p. 1, Corrected and re-published 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 2076/2005	OJ L 338, 22.12.2005, p. 83–88	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 of the Council and amending Regulations (EC) No 853/2004 and (EC) No 854/2004
Regulation (EC) No 178/2002	OJ L 31, 1.2.2002, p. 1–24	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
Regulation (EC) No 315/93	OJ L 37, 13.2.1993, p. 1–3	Council Regulation (EEC) No 315/93 of 8 February 1993 laying down Community procedures for contaminants in food
Regulation (EC) No 1881/2006	OJ L 364, 20.12.2006, p. 5–24	Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs
Regulation (EC) No 401/2006	OJ L 70, 9.3.2006, p. 12–34	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
Decision 2006/504/EC	OJ L 199, 21.7.2006, p. 21–32	2006/504/EC: Commission Decision of 12 July 2006 on special conditions governing certain foodstuffs imported from certain third countries due

Reference	OJ Ref.	Detail
		to contamination risks of these products by aflatoxins