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Directorate F - Food and Veterinary Office

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FINAL REPORT OF A MISSION

CARRIED OUT IN

THAILAND

FROM 03 TO 11 MARCH 2010

IN ORDER TO EVALUATE CONTROLS SYSTEMS FOR PESTICIDES IN FOOD OF PLANT ORIGIN AND TO PREVENT MICROBIOLOGICAL CONTAMINATION IN FRESH HERBS AND SPICES INTENDED FOR EXPORT TO THE EUROPEAN UNION

In response to information provided by the Competent Authority, any factual error noted in the draft report has been corrected; any clarification appears in the form of a footnote.

Executive Summary

The objective of the mission was to follow-up on action taken by the competent authorities of Thailand in response to recommendations made in reports of two previous missions in 2007 and 2008. These missions had evaluated control systems in place to prevent microbiological contamination in fresh herbs and spices, and pesticide residues in fresh fruit and vegetables intended for export to the EU. It was decided to carry out this follow-up mission to Thailand in view of the continued notifications of microbiological contamination and unacceptable levels of pesticide residues in food of plant origin from Thailand within the EU Rapid Alert System for Food and Feed (RASFF).

Since the last missions, the national legislation has been revised. Export certification now covers most, but not all, of the commodities and pesticides involved in EU RASFF notifications.

No adequate information was provided to the visited farmers on which Good Agricultural Practices to follow in order to conform with EU maximum residue levels (MRLs). The information distributed by the competent authority and the pack-houses was not adequate to prevent the presence of pesticide residues exceeding EU MRLs. Not all non-conformances with EU standards for pesticide residues and microbiological contamination are detected during export certification, since the sampling and analysis covers only a part of the consignments exported to the EU. Significant improvements have been made regarding the GMP certification of pack-houses since the last mission. Although the number of HACCP certified companies have increased since the last mission more than 50% of the pack-houses have no procedures based on HACCP principles. Not all the HACCP principles were adequately put in place and implemented by one of the pack-house visited.

Follow-up to EU RASFF notifications by competent authorities has improved, and now includes on-site visits at the pack-houses.

Regarding microbiological analysis, the scope of the accreditation of the current designated private laboratory responsible for official analysis was extended to include the determination of Salmonella, but the QSP laboratory, which is responsible for the monitoring program, has not yet been accredited to ISO 17025 (point 41 of CAC/GL 26-1997 and point 3 of CAC/GL 27-1997). Verification of the standard methods was not always undertaken. The number of sub-samples analysed for Salmonella and E.coli is not equivalent with the requirements laid down in Regulation (EC) No 2073/2005 and Codex Guideline CAC/GL 50-2004.

Regarding pesticide residue analysis, there were improvements in the visited designated laboratories. However, the range of pesticides covered by both visited laboratories in routine analyses is small compared to the number of authorised pesticides, and does not include all pesticides detected in the EU and notified through the RASFF system, in particular fungicides. The sampling procedure for pesticide residues demonstrated to the mission team was not in line with the respective Codex Guidelines CAC/GL 33.

Of the 11 recommendations of the reports for the two missions, 6 have been fully addressed. Work is in progress for the further five recommendations.

It is concluded that although there are further improvements since the last missions, including the export certification, follow-up of EU RASFF notifications, implementation of HACCP, and in the laboratories, the current control system cannot satisfactorily guarantee that food of plant origin exported to the EU will conform with EU standards for pesticide residues and microbiological contamination, due to the identified shortcomings, in particular regarding laboratories and pack-houses.

The report contains recommendations to Thailand to address the shortcomings identified.

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Abbreviations and definitions used in this report

Abbreviation	Explanation
APSRDO	Agricultural Production Sciences Research & Development Office
CA	Competent Authority
CCA	Central Competent Authority
CCG	Certification Coordinating Group
CEICAP	Centre of Export Inspection and Certification for Agricultural Products
CODEX	Codex Alimentarius Commission of the Food and Agriculture Organization of the United Nations and World Health Organization
DG SANCO	Directorate-General for Health and Consumers of the European Commission
DOA	Department of Agriculture
DOAE	Department of Agricultural Extension
EU	European Union
FVO	Food and Veterinary Office
GAP	Good Agricultural Practices
GC-MS	Gas Chromatograph - Mass Spectrometry
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis Critical Control Points
ISO	International Organisation for Standardisation
LC-MSD	Liquid Chromatograph – Mass Spectrometry Detector
LC-MS/MS	Liquid Chromatograph – Tandem Mass Spectrometry

LOD	Limit of Detection
MOAC	Ministry of Agriculture and Cooperatives
MRL	Maximum Residue Level
OAR	Office of Agricultural Regulation
OARD	Office of Agricultural Research & Development
PIS	Plant Product Inspection System Service
PPP	Plant Protection Product
PPRDO	Post-Harvest and Processing Research and Development Office
PSCG	Plant Production Standards and Certification Group
PSCO	Plant Standard and Certification Office
QSP	Quality Control System for Plant Products
RASFF	Rapid Alert System for Food and Feed
SOP	Standard Operating Procedure
SPS	Sanitary and Phytosanitary Measures Committee of the World Trade Organisation
TOSS	Technical One Stop Service Center

1 Introduction

The mission took place in Thailand from 3 to 11 March 2010. The mission team comprised two inspectors from the Food and Veterinary Office (FVO) and one national expert.

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

The inspection team was accompanied during the whole mission by representatives from the central competent authority (CCA), the Department of Agriculture (DOA) of the Ministry of Agriculture and Cooperatives (MOAC).

An opening meeting was held on 3 March 2010 with the DOA. At this meeting, the objectives of, and itinerary for, the mission were confirmed by the inspection team.

2 Objectives Of The Mission

The objective of the mission was to follow-up on action taken by the competent authorities (CA) in response to recommendations made in reports

- DG(SANCO)/2007-7181 to assess the official control systems in place on fresh herbs and spices for export into the European Union, and
- DG(SANCO)/2008-7840 to evaluate the controls of pesticides in food of plant origin intended for export to the European Union.

The mission was carried out under the terms of the following regulations:

- Regulation (EC) No 178/2002;
- Regulation (EC) No 882/2004;
- Regulation (EC) No 852/2004;
- Regulation (EC) No 396/2005.

A full list of the legal instruments referred to in this report is provided in Annex 1. Legal acts quoted in this report refer, where applicable, to the last amended version.

In pursuit of these objectives, the following sites were visited:

Visits/meetings		Comments
Competent Authorities		
Central	1	Department of Agriculture
Regional	1	Office of Agricultural Research and Development Region (OARD) 5 (Suphanburi province)
Laboratories		
Private laboratory	1	Microbiological analysis of herbs and spices and analysis of pesticide residues in fruit and vegetables for export certification
Laboratory of the		

Quality Control System for Plant Products (QSP, former CEICAP)	1	Microbiological analysis of herbs and spices as part of the monitoring system
Laboratory of the Agricultural Production Sciences Research & Development Office (APSRDO)	1	Analysis of pesticide residues in fruit and vegetables for export certification
Inspection or site visits		
Packing houses / Exporter	2	Nakornpathom province and Ratchaburi province, the pack-houses were involved in notifications in the EU RASFF systems for pesticide residues and microbiological contamination;
Farmers	3	Nakornpathom province and Ratchaburi province, growers of holy basil, yard-long beans and Thai broccoli, one of the farmers was involved in a RASFF notification for microbiological contamination, size of the visited farms was between 0.2 and 0.64 hectares;
Other sites (specify)		
Export point	1	Export Plant Quarantine Service, Office of Agricultural Regulation (OAR), Suvarnabhumi airport in Bangkok

3 Legal Basis for the Mission

The mission was carried out under the general provisions of Community legislation, in particular Article 46 of Regulation (EC) No 882/2004, and in agreement with the competent authorities (CA) in Thailand.

4 Background

4.1 Background to present mission

This was a follow-up mission to the visit DG(SANCO)/2007-7181 on microbiological contamination in herbs and spices and to the visit DG(SANCO)/2008-7840 on controls on pesticides in food of plant origin. The reports of these missions can be found on the DG SANCO Internet site: http://ec.europa.eu/food/fvo/ir_search_en.cfm

The previous missions had been organised following infringements of EU maximum residue levels (MRLs) and detections of microbiological contamination in food imported from Thailand, reported

through the EU Rapid Alert System for Food and Feed (RASFF). The reports of the missions contained recommendations to the Thai authorities, and action plans were received, which were considered satisfactory to address the recommendations of the reports.

Since the last missions, the numbers of EU RASFF notifications relating to pesticide residues and microbiological contamination in food from Thailand have not decreased. Regarding pesticide residues, there were 25 RASFF notifications in 2009 and another 26 in 2008. These are the second highest numbers of RASFF notifications for pesticide residues in food from Third Countries. Regarding microbiological contamination, there were 40 RASFF notifications in 2009 and another 29 in 2008, as well as 31 notifications in 2007. These are the highest numbers of EU RASFF notifications for microbiological contamination in food of plant origin imported from Third Countries. The number of notifications is of particular concern in view of the smaller volume of imports from Thailand (25,000 tonnes of fresh fruit, vegetables, herbs and spices), compared to imports from other Third Countries. The high concentrations of pesticide residues (e.g. up to 16 mg/kg of omethoate in fresh basil, 9.5 mg/kg of ethion in fresh coriander), and the presence of microbiological contamination, are of possible concern for consumer health. They also indicate infringements of Good Agricultural Practices (GAP). The pesticide EPN, which was never authorised in the EU, was detected in 7 samples in 2009, and 9 samples in 2008.

4.2 Production and trade information

According to data of the DOA, some 3,500,000 metric tons of vegetables are grown in Thailand on around 375,000 hectares. Some 5,300,000 tonnes of fruit (excluding coconuts) are grown on 835,000 hectares. The DOA informed the mission team that in 2008 some 18,000 tonnes of fresh vegetables, herbs and spices, in addition to 7,839 tonnes of fresh fruit, were exported to the EU.

There are 2,055 GAP certified plots producing for export to the EU. The numbers of registered exporters and certified pack-houses has increased since the last missions. As of March 2010, 81 GMP (Good Manufacturing Practice) certified pack-houses and 212 registered exporters are involved in exports to the EU.

5 Findings And Conclusions

5.1 Legal Requirements

Article 11 of Regulation (EC) No 178/2002 requires that food and feed imported into the Community for placing on the market within the Community shall comply with the relevant requirements of food law or conditions recognised by the Community to be at least equivalent thereto.

Article 18 of Regulation (EC) No 396/2005 requires that products covered by Annex I of the same Regulation shall not contain, from the time they are placed on the EU market as food or feed, any pesticide residue exceeding EU maximum residue levels (MRLs), or 0.01 mg/kg for those products for which no specific MRL is set.

Article 10 of Regulation (EC) No 852/2004, in conjunction with Article 4.1 and Annex I, Part A.III of the same Regulation, requires that food business operators producing or harvesting plant products are, in particular, to keep records on any use of PPPs. In conjunction with Article 4(2) of the same Regulation , it requires that food business operators carrying out any stage of production, processing and distribution of food subsequent to primary production and associated operations must comply with the general hygiene requirements laid down in Annex II to that Regulation. In conjunction

with Article 4(3) of the same Regulation , it requires that food business operators must comply with microbiological criteria for foodstuffs which is laid down in Commission Regulation (EC) No 2073/2005. In conjunction with Article 5(1) of the same Regulation, it requires that food business operators put in place, implement and maintain a permanent procedure or procedures based on HACCP principles. In conjunction with Article 6 of the same Regulation, it requires that every food business operator shall notify the appropriate CA of each establishment under its control that carries out any of the stages of production, processing and distribution of food, with a view to the registration of each such establishment.

Commission Directive 2002/63/EC, which is based on Codex Guideline CAC/GL 33-1999, established sampling methods for official pesticide residue controls.

Relevant Guidelines of the Codex, in particular CAC/GL 26-1997 for the design, operation, assessment and accreditation of food import and export inspection and certification systems and CAC/GL 27-1997 for the assessment of the competence of testing laboratories involved in the import and export control of food.

5.2 Relevant national legislation

Findings

Since the last mission, the Plant Quarantine Act of 1964 has been amended as published on 1 March 2008. The Act provides the legal basis for the compulsory issuance of health certificates for specifically controlled commodities. The notifications of the MOAC of 23 February and 4 August 2009 specify the commodities requiring health certificates, and the micro-organisms and pesticides covered by the health certificates. Since the last missions, 5 additional commodities require export certification for pesticide residues (yard-long beans, Chinese cabbage, kale, Thai coriander, egg plants), and the list of pesticides covered has been extended by the carbamates group. These additional commodities and pesticides have been involved in many of the RASFF notifications in the recent years. However, some further commodities have been notified through the EU RASFF, and are not covered by the health certification requirements: these include pandang leaf and banana leaf regarding micro-organisms, as well as basil and celery for pesticides.

The Notification of the DOA of 9 July 2009 specifies criteria, procedures, and conditions for the application and issuance of Health Certificates.

The Notification of the MOAC of 1 December 2008 and the notification of the DOA of 14 October 2009 provide implementing provisions for the Hazardous Substances Act, which was revised on 25 February 2008. The provisions relate to the criteria and procedures for the authorisation of plant protection products. Authorizations granted under the previous requirements will expire in 2011.

In addition, new MRLs have been proposed for the Thai Agricultural and Food Standard. They are based on Codex MRLs, and supervised field trails in Thailand for those tropical commodities, for which no Codex MRLs exist. The new MRLs have been notified to the Sanitary and Phytosanitary Measures Committee (SPS) of the World Trade Organisation, but are not adopted yet.

Conclusions

The national legislation has been revised. Export certification now covers most, but not all, of the commodities and pesticides involved in EU RASFF notifications. New legislation on the authorisation of plant protection products (PPP) is expected to reduce the number of such products on the market.

5.3 COMPETENT AUTHORITIES

Findings

The central competent authority has not changed since the last mission. It is the DOA of the MOAC. There are some changes regarding the organisational structure. The Post-Harvest and Processing Research and Development Office (PPRDO) has no longer responsibilities in the context of this mission. Currently, the 4 main offices involved are the Office of Agricultural Regulation (OAR), the Agricultural Production Sciences Research & Development Office (APSRDO), the Plant Standard and Certification Office (PSCO) and the Regional Offices of Agricultural Research and Development (OARD). The PSCO was established in 2008, and is mainly responsible for inspection and certification. There are 5 groups under PSCO, in addition to the administrative sub-division:

- Certification Coordinating Group(CCG, former TOSS):
  - Coordinate and manage data and documents on inspection and certification;
  - Issuance of health certificates;
  - Register exporters as set out by DOA's notifications or other notifications involved.
- Plant Production Standards and Certification Group (PSCG):
  - Research and Development on inspection and certification of GAP;
  - Setting standards for production and inspection;
  - Coordinate with other involved bodies for standard setting and certification.
- Plant Product Inspection System Service (PIS, former QPSIG):
  - Research & Development on inspection and certification system of GMP standards.
  - Inspection and certification of GMP and Hazard Analysis Critical Control Points(HACCP).
- Quality Control System for Plant Products (QSP, former CEICAP):
  - Research & Development on analysis
  - Analysis for micro-organisms within the monitoring programme, extension of scope to pesticide residues in planned;
  - Provide training and advice on quality system to laboratories within the DOA.
- Food Safety:
  - Study, analyse, and monitor regulations of major importing countries and international standards;
  - Follow-up of RASFF notifications;
  - Coordinate and negotiate technical measures and standards with competent authorities of importing countries.

Sampling and analysis for health certification are currently delegated to one private laboratory for microbiological analysis. For pesticide residues, this private laboratory and also the APSRDO and three laboratories of the Office of Agricultural Research & Development (OARD) perform analysis, as specified in the previous mission report.

There was evidence for regular and adequate co-ordination and cooperation between the above

offices, including the follow-up to EU RASFF notifications. There is a sufficient number of staff, and there was evidence for regular training of staff. The DOA carries out official controls in accordance with documented procedures which include information and instruction for staff.

Conclusions

Competent authorities are clearly defined, there is good co-operation and sufficient numbers of trained staff.

5.4 Implementation of Controls

Findings

5.4.1 Controls of the Producers and Good Agricultural Practice (GAP) certification

Regulation (EC) No 396/2005 requires that food, from the time it is placed on the EU market, shall not contain any pesticide residue exceeding the limits established in relevant EU legislation. Consequently the application rates of the pesticides and the pre-harvest intervals for the different commodities (Good Agricultural Practices or GAPs) followed by farmers in Thailand are relevant for the possible existence of pesticide residues in food to be exported to the EU.

Plant protection products containing substances on the EU positive list, Annex I to Council Directive 91/414/EEC can be authorised and marketed by EU Member States.

The mission team visited 3 farms producing for export to the EU. No adequate information was provided to the visited farmers on which GAPs to follow in order to comply with EU MRLs:

- The GAP manuals of the DoA, which were developed within the DOA certification process to GAP, are not linked to EU MRLs, but relate to PPPs, which are authorised in Thailand.
- Following mission DG(SANCO)/2008-7840, the DOA has circulated information on pesticides included in the EU positive list, and on those not included, to exporters of fresh fruit and vegetables, and to OARD inspectors. Some of the EU RASFF notifications relate to pesticides, which are included in the positive list, such as carbendazim and dimethoate, while others relate to pesticides, which are not included, such as triazophos. The pesticide EPN, which was involved in many RASFF notifications, was never evaluated in the EU, and does not appear on the positive or negative list.
- Although the pack-houses provided lists of pesticides to be used by their supplying farms, one of these lists contained dinotefuran, which has never been authorised in the EU, and no residues of dinotefuran are allowed in food placed on the EU market. Also, the GAP (commodities, application rates, pre-harvest intervals) for other pesticides recommended by the pack-houses, such as carbendazim and fipronil, is not sufficiently described on the lists provided by pack-houses. The mission team noted the recorded use of carbendazim by one farmer in basil, which may lead to presence of residues exceeding EU MRLs, because the EU MRL for carbendazim in basil is set at the Limit of Determination (LOD) of 0.1 mg/kg.
- In addition, farmers used other pesticides than recommended by the pack-houses, although they were not fully aware of EU MRLs.
- Finally, one of the farmers did not follow the GAPs authorised in Thailand, and described on the labels of two pesticides.

No adequate information was provided to one of the visited GAP certified farmers on microbiological hazards. This farmer is using an organic fertiliser based on manure from the local

market, but had not been informed about the associated risk by the pack-house or the DOA.

Training of farmers is organised by the local and regional administration and the DOAE, with the participation of DOA staff as trainers.

Updated data on GAP certification in the visited provinces was provided by the OARD. The mission team visited a provincial office of OARD 5, which covers two provinces, which are important growing areas for export to the EU. According to the data provided, the number of GAP certified plots has increased significantly in one of the provinces, but dropped considerably in the other province.

5.4.2 Controls of the Pack-houses and Good Manufacturing Practice (GMP) certification

Unlike the previous mission regarding microbiological contamination, all pack-houses (81) are now GMP certified and supplied by GAP farms. In addition, the number of HACCP certified pack-houses has increased from 2 to currently 28, and additionally 21 pack-houses are in the process of HACCP certification.

The mission team visited two pack-houses, which were involved in several EU RASFF notifications. These two pack-houses were HACCP certified. The temperature of the commodity intended for export to the EU is checked by both pack-houses when loading into the polystyrene box at the company and upon arrival at the point of export. Following the RASFF notifications both pack-houses contacted the farmers concerned and the traceability system is able to trace back to individual plots. Both pack-houses participated in the HACCP training sessions organised by the DOA in December 2009. Both pack-houses are inspected once a year regarding the GMP certification by the PIS of the DOA.

The first visited pack-house has its own farm with one GAP plot. The company is also supplied by a number of GAP farms which have formal contracts with the pack-house since June 2009. The company was GMP certified by the DOA two years ago and HACCP certified by a private certifying body in November 2009. The raw material specifications regarding pesticides and microbiological contamination were documented and formally agreed with the farmers in these contracts.

The HACCP plan in this company did not include the microbiological hazards despite the fact the company was notified through the RASFF system for Salmonella. In addition, further deficiencies in the HACCP plan (e.g. lack of validation of the washing step) were observed by the mission team. Regarding the RASFF investigation on the presence of Salmonella in sweet basil made by the PIS of the DOA, inspection and sampling were undertaken and the results of the investigation were notified to the company. In one of the samples taken by the PIS, Salmonella was detected after the washing step but no further actions were taken.

The exporter registration of the company was suspended by the DOA for two months as a result of one RASFF investigation. In this case, the company had exported without GAP certification of the plot. In another RASFF notification, the same pack-house suspended the contract with its supplier after own investigations

The second visited pack-house has a farm with 15 GAP plots. The company is also supplied by more than 20 GAP farms. The majority of the supplying farmers have no formal contracts (only verbal agreement) with this company. The company was GMP certified by the DOA in 2006 and HACCP certified by a private certifying body in 2007.

The HACCP plan in this company did include the microbiological hazards and the validation of the washing step was documented.

The company has been notified through the RASFF system 10 times between 2008 and 2009 and no enforcement actions have been taken as no major problems have been identified by the DOA.

5.4.3 Certification of exports

In EU legislation, certification for pesticide residues in food of plant origin is not required, but the CA have established a system for export certification, which was described in the reports of the previous two missions.

Since September 2009, the export certification procedures have changed. The notification of the DOA of 9 July 2009 specifies that for the issuance of health certificates, exporters must be registered, farmers must be GAP certified and processors GMP certified. The requirements relate to 22 commodities regarding micro-organisms, and 15 commodities regarding pesticides. According to the notification, there are two types of procedures: The first one under point 4.1 of the Notification is applicable for GMP certified packing houses which either have their own GAP certified plots or have a contract with a farmer who has GAP certified plots. The procedure starts by presenting an application for one or more commodities to the DOA. In this case no sampling and analysis is required, and a health certificate is issued which allows the exporter to ship different consignments of the same commodity up to 30 days. The export certificate contains, among other information, the GAP and GMP number, the lot number and lot size, the consignee, the country of destination, and the type of commodities. Before exporting to the EU, OAR staff perform a systematic documentary and identity checks of the consignments listed in the Notification. Sampling for micro-biological contamination is performed as part of the monitoring program. If no non-compliances are found, the products go through Customs who in turn release the consignment.

The second procedure under point 4.2 of the Notification only applies to GMP certified companies who have no formal contracts with farmers. The produce must also originate from GAP certified plots, but unlike in the first system, samples are taken for each health certificate. Samples are taken from one consignment at pack-houses by the designated laboratory staff, and subsequently analysed. If the sample complies with the criteria for pesticides and micro-organisms, the health certificate is issued by PSCO. The health certificate is valid for the production of the sampled commodity from different specified GAP plots for up to 30 days. The different consignments covered by the health certificate can originate from several GAP plots, although only the first consignment is sampled.

At the time of the mission, 7 pack-houses have been notified by PSCO that they can follow the procedure under point 4.1 of the Notification. These pack-houses were not involved in EU RASFF notifications in 2009 and 2010.

The sampling procedure for pesticide residues demonstrated to the mission team generally complied with the respective Codex Guidelines CAC/GL 33-1999 and Commission Directive 2002/63/EC. However, where a consignment consists of several lots from different producers, the lots are not considered separately as required by Annex I of the Guidelines.

The above sampling procedure also applies for E.coli and Salmonella. Regarding the determination of Salmonella and E. coli, 5 sub-samples of 200 g are taken at the packing house and mixed then to produce an aggregate sample of 1 kg following the sampling instructions.

When a consignment consists of several lots, the current sampling procedures do not allow tracing back to an individual lot in case of non-compliance.

In 2009, 10,452 samples were analysed for pesticide residues in the context of export certification

by the designated private laboratory. Exceedances of MRLs were detected in 7.01 % of the samples. There were 10.1 % non-compliances in 2008, 8.55 % in 2007, 7.73 % in 2007 and 6.27 % in 2005. A further 448 samples were analysed in 2009 for pesticide residues by the APSRDO laboratory and the 3 OARD laboratories.

Another 13,172 samples were analysed for E. coli and Salmonella in the private laboratory. Since 2006, the range of non-compliance remains between 4 and 6 % for E. coli, and between 1 and 1.5 % for Salmonella. Within the monitoring programme, the range of non-compliance detected by QSP has slightly decreased to 10 % for *E. coli* and remained around 4 % for *Salmonella*. There is a significant difference between the results from the monitoring programme and those results found for export certification.

5.4.4 Follow-up of notifications in the EU RASFF

EU RASFF notifications are submitted by emails to the DOA either through the National Bureau of Agricultural Commodity and Food Standard (ACFS) or the Office of Agricultural Affairs, Royal Embassy in Brussels. The DOA in turns circulates these notifications to the offices concerned such as PSCO, in particular the Food Safety Unit. The DOA stated that the procedure for RASFF investigation has changed since July 2009. Before July 2009, an official letter was sent to the company concerned requesting to identify the source of contamination and what actions had been taken to improve the situation. In addition, the RASFF information was also submitted to the OAR and OARD. The company has 14 days to reply after they receive the letter. Evidence of these letters was provided to the mission team. After July 2009, on-site verifications were included as part of the RASFF investigation. In this case the Food Safety Unit submits the relevant information to PIS who in turn is responsible to perform an inspection of the packing house concerned. OARD staff are responsible to carry out the investigation in the farms concerned.

According to the information provided by the DOA, 23 pack-houses were involved in the EU RASFF notifications in 2008 and 2009, and only 10 of the companies were HACCP certified.

The DOA has carried out preliminary studies on identification of possible sources of microbiological contamination, temperature control for post harvest transportation and transportation of finished products. Further in-depth and verification studies are planned.

Conclusions

The information distributed by the DOA and the pack-houses to the visited farmers on which GAP to follow was not adequate to prevent the presence of pesticide residues exceeding EU MRLs. Since the sampling and analysis carried out during the export certification covers only a part of the consignments to be exported to the EU, and the range of pesticides tested does not include all pesticides detected in the EU and notified through the RASFF system, the current system in place does not guarantee that products to be exported to the EU conform with the EU standards for pesticide residues.

Significant improvements have been made regarding the GMP certification of pack-houses since the last mission. Although the number of HACCP certified companies have increased since the last mission more than 50% of the pack-houses including the majority of companies notified through the EU RASFF system have no procedures based on HACCP principles. Not all the HACCP principles were adequately put in place and implemented by one of the pack-house visited. The two visited pack-houses have adequate traceability systems in place.

The sampling procedure for pesticide residues demonstrated to the mission team did not fully

comply with the respective Codex Guidelines CAC/GL 33-1999 and Commission Directive 2002/63/EC.

There is a significant difference between the results of Salmonella and E.coli from the monitoring programme (10 % for E. coli and around 4 % for Salmonella) carried out by CA and those results found for export certification (between 4 and 6 % for E. coli, and between 1 and 1.5 % for Salmonella) and no further investigation has been taken.

Follow-up to EU RASFF notifications by competent authorities has improved, and includes now on-site visits at the pack-houses.

Studies relating to identification of possible source of microbiological contamination and the maintenance of the cold chain have not been yet finalized.

5.5 Laboratories

Findings

5.5.1 General organisation

Since the mission SANCO (DG)2007/7181, the number of private laboratories recognised by the DOA for performing microbiological analyses have been reduced from two to one. In addition, there are some changes regarding the food microbiology laboratory responsible for analysis of herbs and spices as part of the monitoring program. The current name of the laboratory (former CEICAP) is the Quality Control System for Plant Products (QSP) laboratory and falls under the PSCO of the DOA. Regarding pesticide residues, there has been no change since the last mission SANCO (DG)2008/7840: The APSRDO laboratory of the DOA, the private laboratory, and three OARD laboratories perform analyses for export certification.

The mission team visited three laboratories, namely the designated private laboratory, the QSP laboratory, and the APSRDO.

A general evaluation was made of the laboratories' system for sample reception, processing and reporting. In the sample reception area, samples are brought in by the laboratory staff in polystyrene boxes along with the test application and the sampling form. The test application contains, among other things, the name and address of the exporter, type and quantity of the product and country of destination.

5.5.2 Private laboratory

As far as microbiological analyses are concerned the laboratory employs the same staff (16) as in the previous mission. Since the last mission, the scope of the accreditation has been extended and now covers the methods for E.coli and Salmonella in food.

The laboratory uses international standard methods for E.coli (AOAC 2005, 991.14) and Salmonella (VIDAS Salmonella method AFNOR (2002), Bio 12/10-09/02 and ISO 6579:2002). The VIDAS method is a rapid method where all samples identified as positive are confirmed by using the above ISO method. The SOPs of the methods were examined by the mission team and found that the verification of these methods was not undertaken, in particular sensitivity and specificity.

The laboratory participates in international proficiency testing schemes (EQA/PT) generally with good results. In one case, an unfavourable result for E.coli was obtained in 2008 however, sufficient

corrective actions were taken.

Unlike the previous mission, the temperature of the sample is monitored on arrival at the reception of the laboratory. There are no written criteria for products with high temperature. The laboratory stated that samples with a temperature over 15°C would be rejected. However, it never happened in the past.

Regarding the determination of Salmonella, a two-sampling program is not followed as none of these 5 sub-samples (see point 5.4.3) are tested separately. Instead, 500 g are taken from the aggregate sample for microbiological analysis and only 25 g are taken for Salmonella analysis. This is not equivalent to the requirements of Annex I to Commission Regulation (EC) No 2073/2005 and Codex Guideline CAC/GL 50-2004.

A summary of samples analysed in fresh herbs and spices to be exported to the EU by this laboratory is detailed in Table 1.

Table 1

Year	Total no of samples analysed in fresh herbs and spices	Number of non-compliant samples	Number of non-compliant samples – E. coli	Number on non-compliant samples - Salmonella
2008	13754	745	621	158
2009	13172	666	533	152

Regarding pesticide residue analyses, the laboratory has adequate facilities, equipment, and sufficient numbers of staff, who are well trained. Since the last mission, the scope of the accreditation has been extended. It now covers 44 pesticides and metabolites in vegetables within the pesticide residues method. A further method based on LC-MSD for 11 carbamates has been submitted for accreditation, and confirmation by LC-MS/MS has been introduced. The laboratory applies good quality control procedures and participates in international proficiency testing schemes, generally with good results. The method for pesticide residues is fully validated. The range of pesticides covered in routine analyses is small compared to the number of authorised pesticides, and does not include all pesticides detected in the EU and notified through the RASFF system, in particular fungicides.

5.5.3 Laboratory of QSP

The QSP food microbiology laboratory has increased the number of staff from 9 to 13 including the head of the department since the last mission. The laboratory is not yet accredited to ISO 17025 as required under point 41 of CAC/GL 26-1997 and point 3 of CAC/GL 27-1997 but the Standard Operating procedures (SOPs) and the working instructions have been drafted. Evidence of training sessions (e.g. ISO 17025, ELISA test for Salmonella, microbiological test for agricultural commodities) was shown to the mission team.

The laboratory uses the same methods for E.coli and Salmonella as the private laboratory. The SOPs (3) of these methods were checked by the mission team. The verification of the two standard methods used for Salmonella was undertaken. However, the verification for the E. coli method was not carried out, in particular sensitivity and specificity.

The laboratory participates in international proficiency testing schemes (EQA/PT - External Quality

Assessment/Proficiency testing scheme) for Salmonella and E. coli generally with good results. However, one unsatisfactory result regarding E. coli as part of its quality control was found and no further investigation was carried out.

The temperature of the sample is monitored on arrival at the reception of the laboratory. However, as indicated in the previous report there are no written criteria for products with high temperature. This means that samples with temperature over 18°C are analysed.

A summary of samples analysed in fresh herbs and spices taken at the point of export as part of the monitoring program is detailed in Table 2.

Table 2

Year	Total no of samples analysed in fresh herbs and spices	Number of non-compliant samples	Number of non-compliant samples – E. coli	Number on non-compliant samples - Salmonella
2008	385	57	37	13
2009	372	45	42	17

5.5.4 Laboratory of APSRDO

The APSRDO laboratory facilities are located in different parts of the building, which complicates the work flow. The laboratory has adequate equipment and a sufficient number of trained staff. Method development and training are also provided for OARD laboratories. Since the last mission, the scope of the accreditation of the pesticide residues method has been extended to 28 substances. The method is adequately validated in, and accredited for, mango. Further method validation was performed including additional pesticides and commodities, GC-MS, and the QuEChERS method. The laboratory generally applies quality control procedures and participates in international proficiency testing schemes, commonly with good results. However, the traceability of data and records was not satisfactory for a part of the calibration data, which were lost due the collapse of a hard disk. Identification of pyrethroids and carbamates is based on their typical chromatographic behaviour.

The range of pesticides covered in routine analyses is small compared to the number of authorised pesticides, and does not include all pesticides detected in the EU and notified through the RASFF system, in particular fungicides.

Conclusions

Regarding microbiological analysis, the two visited laboratories are adequately staffed and have well documented methods. However, verification of the standard methods was not always undertaken. The scope of the accreditation of the current designated private laboratory responsible for official analysis was extended to include the determination of Salmonella, but the QSP laboratory has not yet been accredited to ISO 17025 (point 3 of CAC/GL 27-1997).

The samples analysed for Salmonella by the private laboratory do not follow the requirements equivalent to Commission Regulation (EC) No 2073/2005 and Codex Guideline CAC/GL 50-2004

Regarding pesticide residue analysis, there were improvements in the visited designated

laboratories, especially with accreditation and introduction of LC-MS in laboratory practice. However, the range of pesticides covered by both visited laboratories in routine analyses is small compared to the number of authorised pesticides, and does not include all pesticides detected in the EU and notified through the RASFF system, in particular fungicides.

5.6 Follow-up to recommendations of the previous reports

Findings

The reports of the previous missions identified some shortcomings. The following table lists the recommendations and how the recommendations have been addressed by the Competent Authorities.

Recommendations of mission DG(SANCO)/2007-7181	Follow-up in mission DG(SANCO)/2010-8575
1. To ensure that food business operators (packing houses) exporting herbs and spices to the EU put in place, implement and maintain permanent procedures based on the HACCP principles at least equivalent to the requirements laid down in Article 10 of Regulation (EC) No 852/2004 in connection with Article 5 of same Regulation.	In progress. The number of pack-houses which have food safety procedures based on HACCP principles have increased from two to 28 since the last mission. Nevertheless, there are around 52 pack-houses which have not yet HACCP procedures in place.
2. To ensure that food business operators (packing houses) exporting herbs and spices to the EU are following the provisions at least equivalent to the requirements laid down in Article 10 of Regulation (EC) No 852/2004 in connection with Article 6 of same Regulation.	Addressed. According to the Thai legislation only GMP certified pack-houses which are supplied by GAP farms can export to the EU. These provisions also ensure registration of exporters to the EU.
3. To ensure that the sampling instructions issued by the Competent Authority are followed by the two recognised laboratories.	Addressed. The sampling observed did follow the sampling procedures.
4. To ensure that food business operators (farms and packing houses) which intend to export herbs and spices to the EU, implement hygiene standards equivalent to the requirements laid down in Article 10 of Regulation (EC) No 852/2004 in connection with Article 4 (Part A of Annex I, and Annex II) of same Regulation.	Addressed. With the new provisions in place (see above) only GAP farms can supply to pack-houses.
5. To ensure the maintenance of the cold chain on the herbs and spices exported to the EU are in line with Article 10 of Regulation (EC) No 852/2004 in connection with Article 4.3.c. of same Regulation.	In progress. Studies on the maintenance of the cold chain have not yet been finalised.

Recommendations of mission DG(SANCO)/2007-7181	Follow-up in mission DG(SANCO)/2010-8575
6. To ensure that the RASFF notifications are sent to all the companies concerned and followed up by the Department of Agriculture.	Addressed. Companies notified through the RASFF system are informed by the DOA.
7. To consider the accreditation to ISO 17025 of official control laboratories to ensure the equivalence with Article 18 of Regulation 2076/2005. Equivalence to Article 12.2 of Regulation (EC) no 882/2004 should be demonstrated by January 2010.	In progress. The QSP laboratory has drafted the relevant SOPs and application to the national accreditation body is expected in June 2010.

Recommendations of mission DG(SANCO)/2008-7840	Follow-up in mission DG(SANCO)/2010-8575
1. Thailand should develop GAP manuals for all commodities, which require GAP certification of the producers for export to the EU. The GAP manuals should take into consideration EC pesticide MRLs and comply with national legislation.	In progress. The draft GAP manual for yard-long beans has been finalised, and work is in progress to develop further GAP manuals (planned for 2010-2015) GAP manuals do not take into consideration EU pesticide MRLs.
2. Thailand should consider extending the number of commodities requiring export certification to include those commodities recently notified in the EU RASFF system.	Addressed. There are five additional commodities requiring export certification.
3. Thailand should continue the accreditation process to ISO 17025 of official control laboratories to ensure the equivalence with Article 18 of Commission Regulation (EC) No 2076/2005 and to ensure that these laboratories provide reliable analytical results. Equivalence to Art 12 (2) of Regulation (EC) No 882/2004 should be demonstrated by 1 January 2010.	In progress. Application for accreditation to ISO/IEC 17025 was submitted by OARD 1, 2, and 6. OARD 5 expects to apply for ISO/IEC 17025 in 2010. The laboratory participated in proficiency tests with satisfactory results.
4. Thailand should consider broadening the scope of analytes sought in the pesticide residue laboratories to improve the effectiveness of the controls for pesticide residues.	Addressed. Substances are extended to cover the carbamate group.

Conclusions

Of the 11 recommendations of the reports for the two missions, 6 have been fully addressed. Work is in progress for further five recommendations, in particular regarding development of GAP guides,

accreditation of laboratories, implementation of HACCP systems in pack-houses, the planned study on the maintenance of the cold chain.

6 Overall Conclusions

Although there are further improvements since the last missions, including the export certification, follow-up of EU RASFF notifications, implementation of HACCP, and in the laboratories, the current control system cannot satisfactorily guarantee that food of plant origin exported to the EU will conform with EU standards for pesticide residues and microbiological contamination, due to the identified shortcomings, in particular regarding laboratories and pack-houses.

7 Closing Meeting

A closing meeting with the DOA was held on 11 March 2010. At this meeting, the main findings and conclusions of the mission were presented by the inspection team. The representatives of the DOA offered some clarifying comments. They had no objections to the main findings and conclusions.

8 Recommendations

To the competent authorities of Thailand.

In relation to microbiological contamination and pesticide residues in fresh herbs and spices, fruit and vegetables intended for export to the European Union, Thailand should improve the controls, in order to guarantee that the produce complies with, or is equivalent to, European Union standards pursuant to Article 11 of Regulation (EC) No 178/2002.

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:

N°.	**Recommendation**
1.	Consider providing clear information to farmers on pesticide GAPs which will not lead to pesticide residues exceeding EU MRLs. Such information should include, inter alia, the pesticides, commodities to be treated, application rates and pre-harvest intervals.
2.	Ensure that food business operators (pack-houses) exporting herbs and spices to the EU put in place, implement and maintain permanent procedures based on the HACCP principles at least equivalent to the requirements laid down in Article 10 of Regulation (EC) No 852/2004 in connection with Article 5 of same Regulation.
3.	Consider revising the sampling procedure for pesticide residues so that it is in line with the respective Codex Guidelines CAC/GL 33-1999.
4.	Consider that laboratories performing official controls are accredited under official

N°.	Recommendation
	recognised programs (ISO 17025) to ensure that adequate quality controls are in place to provide for the reliability of test results (point 41 of CAC/GL 26-1997 and point 3 of CAC/GL 27-1997).
5.	Ensure that laboratories performing official controls use methods of analysis which have been validated according to the principles laid down by the Codex Alimentarius Commission to ensure that adequate quality controls are in place to provide for the reliability of test results (point 41 of CAC/GL 26-1997 and point 3 of CAC/GL 27-1997).
6.	Ensure that samples analysed for Salmonella follow the requirements at least equivalent to Commission Regulation (EC) No 2073/2005 and Codex Guideline CAC/GL 50-2004.
7.	Consider further broadening the scope of analytes sought in the pesticide residue laboratories to cover those pesticides involved in EU RASFF notifications.

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

http://ec.europa.eu/food/fvo/ap/ap_th_2010-8575.pdf

Annex 1 - Legal References

Legal Reference	Official Journal	Title
Reg. 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
Reg. 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
Reg. 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
Reg. 396/2005	OJ L 70, 16.3.2005, p. 1-16	Regulation (EC) No 396/2005 of the European Parliament and of the Council of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC
Reg. 2073/2005	OJ L 338, 22.12.2005, p. 1-26	Commission Regulation (EC) No 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs
Dir. 91/414/EEC	OJ L 230, 19.8.1991, p. 1-32	Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market
Dir. 2002/63/EC	OJ L 187, 16.7.2002, p. 30-43	Commission Directive 2002/63/EC of 11 July 2002 establishing Community methods of sampling for the official control of pesticide residues in and on products of plant and animal origin and repealing Directive 79/700/EEC