Rapport 7 – 2010 Part I

The Swedish Monitoring of Pesticide Residues in Food of Plant Origin: 2008

Part I: National Report

by Arne Andersson, Frida Broman, Anna Hellström and Bengt-Göran Österdahl

LIVSMEDELS VERKET
NATIONAL FOOD ADMINISTRATION, Sweden

Rapporter som utgivits 2009

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The Swedish Monitoring of Pesticide Residues in Food of Plant Origin: 2008

National Report

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Summary

In 2008, a total of 1 536 surveillance samples of fresh, frozen or processed fruits and vegetables, cereal grains and cereal products were analysed for residues of 312 pesticides (377 analytes). National or EC harmonised Maximum Residue Limits (MRL) were exceeded by 82 samples (5.3 %).

Residues above the MRLs were found in 6.9 % out of 1 119 samples of fresh or frozen fruits and vegetables including potatoes. These exceedances amounted to 11 % in fresh or frozen fruits and vegetables from third countries, 3.6 % in the samples from EU countries except Sweden and 0 % in the samples of domestic origin.

In total, 42 samples of baby foods were analysed. None of the samples contained detectable residues.

The frequency of samples containing residues was somewhat higher in domestic Integrated Production (29 %) compared with domestic conventional production (19 %).

Beans, carrots, cucumbers, mandarines, oranges, pears, potatoes, spinach, and rice, 380 samples in all, were analysed in the 2008 EC co-ordinated programme. Thirteen of these samples exceeded EC-MRLs for the 78 pesticides looked for in this programme.

Pesticide residues were found in ten commodities (14 samples) at levels more than ten times the MRLs. The highest violation rate, 130 times the MRL, was found in a sample of chilli pepper from India containing dicofol. NFA prescribed conditions for the offering for sale or other handling of lots from these growers/exporters. Furthermore, four RASFF-notifications were sent to the Commission.

About 47 % of the samples of fresh or frozen fruits and vegetables contained two or more pesticides in a single sample. In one sample of chilli peppers from Thailand, 13 pesticides were found. Two samples contained 11 pesticides – one sample of chilli peppers from Thailand and one sample of tomatoes from Egypt.

A total of 279 samples of cereal grains were analysed. Most of the samples (73 %) contained no residues but five of the samples (1.8 %) exceeded the MRLs. About 9.7 % of the samples contained two or more pesticides in a single sample.

In the enforcement sampling of fruits and vegetables 64 samples were collected and ten lots (11.5 tons) were prohibited from being sold.

The short-term intake was estimated for the acute toxic pesticides based on the highest residue found in a surveillance (composite) sample. The acute reference dose (ARfD) was exceeded for children in 8 cases. The highest intake reached 10 times the ARfD and was due to residues of carbaryl in celery from Thailand.

The overall conclusion is that the pesticide residues found were in most cases well below the safety limits. However, in a couple of cases the safety margins have been undermined, which is not acceptable. The lack of methods to assess the impact of multiple residues is a matter of concern.

Introduction

The Swedish National Food Administration (NFA) checks foods of plant origin for pesticide residues. Annual reports have been published in English since 1986.

The present report is a combination between a National report (Part I) and the report which was submitted to the European Commission and EFSA in August 2009 (Part II). It is aimed to give a complete picture of the pesticide residue control and the residue findings during 2008. **Part I** of the report contains general information about the monitoring programme, sampling procedures, analytical methods used, residue findings as well as assessment of the short-term intake. **Part II** gives a two page summary followed by detailed information about samples analysed and residues found using the format requested by the European Commission.

Tuija Pihlström and Susanne Ekroth have been responsible for the method development at the National Food Administration. The validation of the analytical methods has been done under supervision of Paula Friman at the official contracted laboratory, Eurofins Food & Agro AB in Lidköping. About 90 % of the samples has been analysed at this laboratory, and NFA has analysed about 10 % of the samples.

This report is available on NFA's web site www.livsmedelsverket.se. All reports from the Swedish monitoring pesticide residues in food of plant origin since 1999 are also available on NFA's web site: ("Läs och hämta rapporter/Bekämpningsmedel").

Monitoring programme

The target number of samples to be collected of each food takes into account the consumption rate of the food. However, fewer samples are taken of commodities causing only few exceedances of the MRLs. The number is also based on the importance of the foodstuff in the diets of infants and young children and if the food is consumed with or without the peel. In some cases, the number of samples of a specific food or a food from a particular country was increased based on residues found in prior samples.

By analysis of 100 samples it can be predicted with 95 % confidence that the actual percentage of exceedances is less than 3 %, provided that no exceedances was discerned.

About 60 different commodities were included in the sampling plan for year 2008 (Table 1, and Table C in Part 2 of this report).

Table 1. Number of samples and main commodities to be collected according to the monitoring programme 2008 and the outcome of the sampling.

Commodity	No of samples		Commodity	No of samples	
	Planned	Outcome		Planned	Outcome
Fruits			Spinach	25	25
(fresh or frozen)	**640**	**668**	Tomatoes	45	46
Apples	135	137	Others	80	91
Bananas	50	50			
Citrus fruits	125	132	**Processed or**		
Peaches and nectarines	40	38	**dried products**	**135**	**138**
Pears	60	62	Baby food	40	42
Strawberries	40	40	Canned sweet	15	12
Table grapes	80	81	Cereal	10	7
Others	110	128	Dried fruit	10	18
			Juice	25	24
Vegetables			Vegetable oils	35	35
(fresh or frozen)	**415**	**451**			
Beans	25	32	**Cereal grains**	**250**	**279**
Cabbage	25	32	Rice	65	65
Carrots	25	26	Rye	35	32
Chili pepper	15	19	Oat	10	7
Cucumber	30	30	Wheat	140	172
Leek	15	13	Barley		1
Lettuce	25	25	Mixed cereal		2
Melons	15	15			
Onions	25	30	**Total**	**1 500**	**1 536**
Peppers	20	21			
Potatoes	45	46			

Sampling procedures

Surveillance monitoring
Samples collected in accordance with the monitoring programme are defined as surveillance samples, i.e. there are no suspicions about excessive amounts of pesticide residues in the lots prior to sampling.

Enforcement sampling
When a surveillance sample contains a pesticide residue above the national or EC maximum residue limit, the NFA prescribes a condition for the offering for sale or other handling of the food or lot to which the food belongs. As a follow-up, next lots of the commodity from the grower/exporter are detained and enforcement samples are collected. The condition is cancelled either when a certain number of lots have been shown to contain pesticide residues below the MRLs, or when other information shows that the residue problem do not exist any longer. Surveillance sampling are then once more resumed.

Sample collection
Fresh fruit and vegetables were sampled at wholesalers' warehouses in the first trade channel. The sampling was done according to the EC sampling method described in Commission Directive 2002/63/EC (3). The samples were sealed and labelled with a unique sample identity.

Most samples of processed or frozen fruit and vegetables, juices, fruit drinks, rice, cereal products and vegetable oils were collected in retail shops or department stores.

Samples of domestically produced cereal grains were collected at the milling plants. The imported cereal grains were sampled at the port where the shipment was discharged. Usually, one bulk sample of about 3–5 kg was collected by stream sampling technique.

Plant inspectors from the National Board of Agriculture collected most samples, but inspectors from the Municipal Environmental and Health Protection Committees were to some extent also involved.

Quality assurance measures
Trained inspectors belonging to the National Board of Agriculture collected the samples according to written instructions from the National Food Administration. The bags with the samples were sealed and a photo was taken of the box that had been sampled.

Analytical methods

Method development and validation

Tuija Pihlström and Susanne Ekroth, National Food Administration
Paula Friman, Eurofins Food & Agro AB

Most of the method development is done at the National Food Administration (NFA). Validation of the methods is carried out by both NFA and Eurofins Food & Agro AB (Eurofins). The close cooperation between NFA and the highly competent laboratory staff at the contracted official laboratory Eurofins allows a quick and trustworthy transfer of the methods for monitoring of pesticide residues.

The multi residue method (MRM) code 200 has been continuously revised and improved and its scope has been extended by 32 pesticides and metabolites (Table 2). During the recent years efforts have been made to simplify this MRM. The result is an improved methodology for analysis of basic pesticides in matrices with different pH by adding $NaHCO_3$ prior to the extraction step. Furthermore, the development of replacing the determination using GC equipped with conventional detectors (ITD, ECD and FPD) by GC-MS/MS was finalized in 2006 and was introduced in the control by 1 January 2007. This has further simplified the method as the GPC clean-up step is deleted.

Table 2. Pesticides and metabolites added to the control in 2008. The reporting limit is 0.01 mg/kg for these pesticides.

Bifenthrin	Fensulfothion-oxon-sulphone	Isocarbophos	Pymetrozine
Boscalid	Fensulfothion-sulphone	Isofenphos-methyl	Pyraclostrobin
Carvone	Fludioxonil	Isoxaben	Terbufos-oxon
DMSA	Haloxifop	Kresoxim-methyl	Terbufos-oxon-sulphoxide
DMST	Haloxifop-2-ethoxyethyl	Mepanipyrim	Terbufos-sulphone
Fenhexamid	Haloxyfop-R-methyl	Methacrifos	Terbufos-sulphoxide
Fenpyroximate	Hexaconazole	Penconazole	Thiacloprid
Fensulfothion-oxon	Indoxacarb	Phenmedipham	Triazophos

Pesticide coverage

In all, by using both (MRMs) and single residue methods (SRMs), it was possible to determine 312 pesticides corresponding to 377 analytes including metabolites and degradation products (Appendices 2–3). This is an increase with 12 pesticides compared with 2007 (4). By using LC-MS/MS it has been possible to lower the limit of quantification (LOQ) to 0.01 mg/kg for a large number of pesticides. The analytical method codes and their sources are listed in Appendix 1.

Fruit and vegetables

The analysis of pesticide residues in fruit and vegetables is carried out by using the MRM code 200, which is based on extraction with ethyl acetate and determination of the residues by using GC-MS/MS and LC-MS/MS. A total of 264 pesticides (325 analytes) were covered by this method.

In addition to this MRM, another MRM (code 201) for benzoylphenylurea insecticides, and eight single residue methods were used. In all, 291 pesticides (352 analytes) were sought in fruits and vegetables. Of these pesticides, 135 were actually found. Figure 1 shows number of samples analysed, as well as pesticides sought and detected during the last nine years.

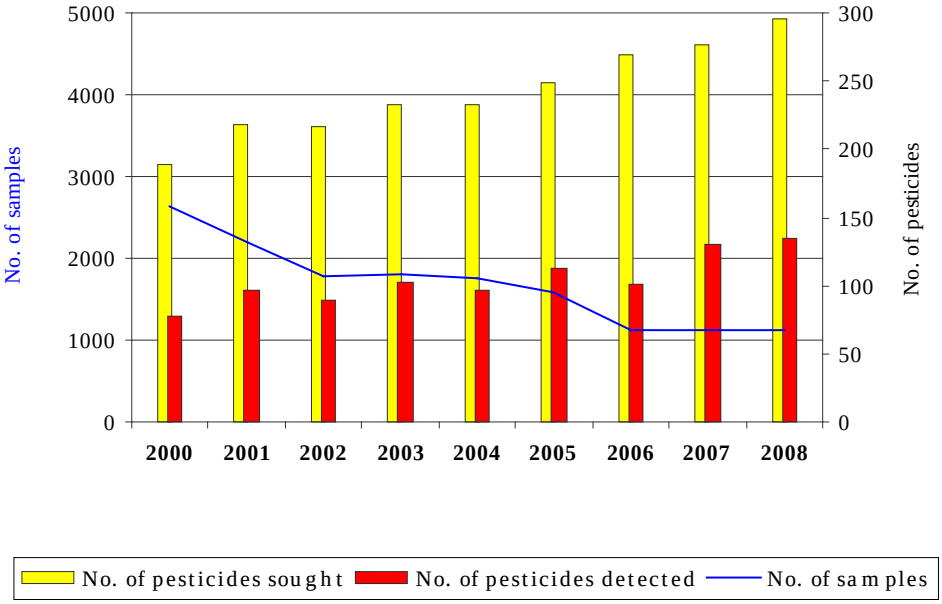

Figure 1. *Number of pesticides (active substances) sought and detected, and number of samples of fruit and vegetables analysed, surveillance sampling 2000-2008.*

Vegetable oils and oil seeds

The samples of vegetable oils and oil seeds were extracted using ethyl acetate/ cyclohexane (1+1). After clean-up on an S-X3 gel permeation column the residues were determined by GC-MS/MS and LC-MS/MS. A total of 41 pesticides (50 analytes) were covered by the method used (code 031).

Cereal grains and cereal products

All samples of cereal grains and cereal products were analysed using the two MRMs code 914 and code 915. Single residue methods were used for analyses of chlormequat and mepiquat (code 030), inorganic bromide (code 010), hydrogen phosphide (code 909), glyphosate and AMPA (code 913). In all, 100 pesticides (120 analytes) were included in the control of cereals.

Quality control
Among other procedures, the quality control included daily checks of the instruments' sensitivity by injection of test solutions. GC-determinations were in most cases carried out using standards in matrix extracts.

The EC guideline ”Method validation and quality control procedures for pesticide residues analysis in food and feed” (5) have been implemented.

The laboratory Eurofins Food & Agro AB participated in four proficiency tests organised by EC and in 16 tests organised by FAPAS (UK). NFA participated in two PT:s organised by EC (Table G in part 2 of this report).

Laboratories used and accreditation
About 90 % of the analyses were carried out on a contract basis at Eurofins Food & Agro AB, under the management of Annelie Larsson and Annelie Claesson. This official laboratory is accredited by the Swedish accreditation authority SWEDAC for all analytical methods used for the NFA’s official control of pesticide residues in food of plant origin. NFA carried out the analysis of about 10 % of the samples under the management of Tuija Pihlström and Susanne Ekroth. NFA is also accredited by SWEDAC.

Reporting levels

The majority of the pesticide residues were measured and reported from the limit of quantitation (determination), generally in the range of 0.01–0.1 mg/kg. Reporting levels for each of the pesticides are given in Table A2 in Part 2 of this report. For a few pesticides the EC-MRLs set at the LODs (Limit of Determination) were not achievable in our routine monitoring.

Maximum Residue Limits

In the EU, as from 1 September 2008, a new legislative framework (Regulation (EC) No 396/2005 of the European Parliament and of the Council) on pesticide residues is applicable. All national MRLs was collected around the member states and introduced in the new Regulation, unless intake concern was identified. Until 1 September 2008, the National Food Administration´s Regulation on Pesticide Residues in Food, had established MRLs for about 300 individual substances or group of substances (according to the residue definition in the regulation). Fresh, frozen and dried fruits and vegetables, cereal grains, some cereal products as well as baby foods was covered by the regulations.

At the time, national and EC-MRLs, applied equally to domestic, EU and third country commodities, whether or not the pesticide was authorised in Sweden. When regulations concerning a certain pesticide or a certain group of food products was not given in the regulations, the National Food Administration could decide the maximum level to be applied in each individual case. However, as from 1 September 2008, Regulation (EC) 396/2005 introduced a default MRL of 0,01 mg/kg. The new Regulation completes the harmonisation and simplification of pesticide MRLs, whilst

ensuring better consumer protection throughout the EU. With the new rules, MRLs undergo a common EU assessment to make sure that all classes of consumers, including the vulnerable ones, like babies and children, are sufficiently protected.

Results and discussion

Surveillance monitoring

In 2008, a total of 1 536 surveillance samples of fresh, frozen or processed fruit and vegetables, vegetable oils, cereal grains and cereal products were analysed for residues of 312 pesticides (377 analytes). National and EC harmonised Maximum Residue Limits (EC-MRLs) were exceeded by 82 (5.4 %) of these samples (Table A1 – Part I, and Tables D1 and D2 in Part 2 of this report).

About 70 % of the samples originated from foods from 59 foreign countries. Most of the samples with unknown origin came from processed products (Table 3). In 2007, the number of samples amounted to 1 525 originating from 54 countries (4).

Out of 1 119 samples of fresh or frozen fruits and vegetables 796 samples (71 %) contained residues at or below national and EC-MRLs and 76 samples (6.8 %) exceeded these limits.

Five (1.8 %) of the 279 samples of cereal grains exceeded the MRLs and 73 % contained no residues at all.

In all, 2 597 analyses and about 424 000 determinations were carried out using 14 analytical methods. The number of surveillance samples analysed by the different analytical methods arranged by food-groups is shown in Appendix 3. Out of the 312 pesticides (active substances) sought in all foodstuffs 135 were actually detected. The total numbers of findings of each pesticide in fruits, vegetables and cereal grains are shown in Table A2, Part I and Part II in Part 2 of this report.

Table 3. Total number of surveillance samples by country analysed in 2008

Country	No. of samples	Country	No. of samples	Country	No. of samples
Argentina	60	Greece	7	Pakistan	7
Australia	4	Honduras	4	Panama	21
Austria	2	Hungary	8	Peru	10
Belgium	20	India	41	Poland	8
Boznia-herzegovina	1	Iran	2	Puerto Rico	2
Brazil	56	Israel	34	Senegal	3
Bulgaria	1	Italy	79	Slovenia	1
Cameron	1	Ivory Coast	3	South Africa	41
Canada	3	Jordan	5	Spain	117
Chile	34	Kazakhstan	1	Swaziland	2
China	6	Kenya	12	Sweden	430
Colombia	23	Latvia	2	Syrian Arab Rep.	1
Costa Rica	19	Lebanon	5	Thailand	62
Croatia	1	Lithuania	6	Turkey	32
Cyprus	6	Madagascar	4	United Kingdom	6
Denmark	19	Malaysia	1	United States	53
Ecuador	10	Mauritius	2	Unknown country	17
Egypt	33	Morocco	35	Uruguay	11
France	16	Namibia	3	Zimbabwe	1
German Fed.Rep.	57	Netherlands	67		
Gahna	1	New Zeeland	16	**In total**	**1 536**

Table D1 in Part 2 of this report gives detailed information about pesticide residues found and action taken for those 81 surveillance samples that exceeded EC harmonised MRLs. In 17 of the samples, two or more pesticides exceeded the EC-MRLs in the same sample. Three of those samples contained even four pesticides above the harmonised limits and one sample of chilli pepper contained as many as nine pesticides above the limits.

Information about pesticide residues found and action taken for surveillance samples of fruits and vegetables that exceeded non-harmonised MRLs is given in Table D2 in Part 2 of this report.

The most commonly found pesticides in fresh or frozen fruit, vegetables and cereal grains are presented in Table 4. The fungicides thiabendazole and imazalil were among those most often found in fruits, while imidacloprid and cypermethrin were most often found in the vegetable samples. Out of the 11 different pesticides detected in cereal grain, the growth regulator chlormequat was most often found.

Table 4. Pesticides most commonly found in fresh or frozen fruits and vegetables and cereal grains, surveillance sampling in 2008

Fruits (668 samples)		**Vegetables** (451 samples)		**Cereal grains** (279 samples)	
Pesticide	*No. of findings*	*Pesticide*	*No. of findings*	*Pesticide*	*No. of findings*
Thiabendazole	179	Imidacloprid	30	Chlormequat	23
Imazalil	165	Cypermethrin	29	Glyphosate	13
Chlorpyrifos	117	Propamocarb	27	Pirimiphos-methyl	12
Carbendazim	85	Boscalid	18	Phosphine	11
Boscalid	55	Chlorpyrifos	16	Bromide (inorganic)	10
Orthophenylphenol	55	Metalaxyl	14	Piperonyl butpxide	10
Iprodione	42	Dimethoate	13	Mepiquat	9
Prochloraz	41	Iprodione	13	Trinexapac	9
Pyraclostrobin	37	Methomyl	13	Malathion	6
Dithiocarbamates	35	Azoxystrobin	12	Carbendazim	2
		Carbendazime	12	Imidacloprid	2

Multiple residues

Out of 1 119 samples of fresh or frozen fruits and vegetables (surveillance samples) 47 % contained residues of two or more pesticides in a single sample. About eight percent of the samples contained five or more pesticides in a single sample. The highest number of pesticides found in a single sample was 13 in one sample of chilli pepper from Thailand. Another sample of chilli from Thailand contained 11 different pesticides in the same sample and one sample of tomatoes from Egypt contained 11 different pesticides as well. Out of 279 samples of cereal grains (surveillance) 27 (9,7 %) contained residues of two or more pesticides in a single sample. Detailed information is given in Table E in Part 2 of this report for all samples with two or more pesticide residues in a single sample.

Comparison of residues from different types of production system
The total number of samples analysed from organic, integrated (IP) and conventional production was 35, 109 and 1 392, respectively (Table 5). None of the samples of products from organic production contained residues. 30 samples (29 %) from domestic Integrated Production (IP) contained residues but none of these samples exceeded the MRLs. Out of the 312 samples from domestic conventional production, 59 samples (19 %) contained residues. None of these samples exceeded the MRLs. The figures indicate that pesticide residues occurred more frequently in samples from domestic integrated production compared with samples from domestic conventional production.

Table 5. Comparison of residues found grouped by type of production, surveillance sampling in 2008

Type of production	**Origin**	**Total no. of samples**	**No. of samples containing**		
			No residues	**Residues ≤ MRL**	**Residues > MRL**
Organic	Domestic	13	13	0	0
"	Import	22	22	0	0
IP	Domestic	105	75	30	0
"	Import	4	4	0	0
Conventional	Domestic	312	253	59	0
"	Import	1 080	362	636	82

Fruits and vegetables - fresh or frozen

A total of 1 119 samples of fresh or frozen fruit and vegetables including potatoes were analysed for residues for 291 pesticides (352 analytes including metabolites and degradation products). About 29 % of the samples contained no residues. National or EC-MRLs were exceeded in 76 (6.8 %) of the samples (Figure 2). The number of exceedances in 2007 was 62 (5.5 %) (4).

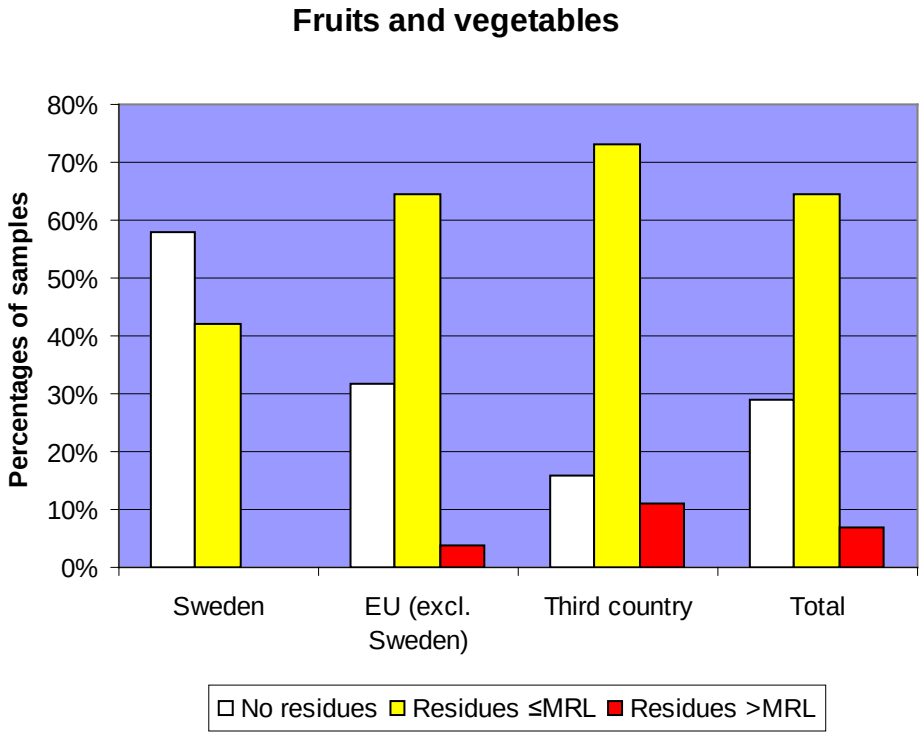

***Figure 2**. Summary of results for fresh or frozen fruit and vegetables, surveillance sampling in 2008.*

In general, commodities from third countries contained more often residues than those from EU-countries. Most samples (66 %) of domestic grown fruit and vegetables contained no residues. The corresponding figures for EU-countries (except Sweden) and third countries were 33 % and 19 %, respectively. None of the samples of domestic grown fruits and vegetables exceeded national or EC-MRLs compared with 3.6 % of the samples from EU-countries (except Sweden) and 11 % from third countries.

Number of surveillance samples of each fruit and vegetable and the pesticide residues found (in per cent of the MRL) are presented in Appendix 4.

Samples containing pesticide residues greater than 10 times the MRL are shown in Table 6. The ratio between the highest level found in the surveillance samples and the MRL is given. Residues of dicofol in a sample of chilli pepper from India amounted to 129 times the MRL. However, the high figures are partly due to cases where the MRLs are set at the limit of determination.

Table 6. Samples containing pesticide residues greater than 10 times the MRL, surveillance sampling in 2008.

Commodity	Origin	Pesticide	Max residue found (mg/kg)	MRL (mg/kg)	Ratio max residue/ MRL
Chilli peppers	India	Dicofol	2.59	0.02	129
		Triazophos	0.16	0.01	15
Pomegranates	India	Carbendazim	0.56	0.01	56
Coriander	Thailand	Profenfos	2.23	0.05	45
		Propiconazole	1.55	0.05	31
Celery leaves	Thailand	Carbaryl	2.17	0.05	43
Chilli peppers	Thailand	Triazophos	0.40	0.01	40
		Dimethoate	0.73	0.02	36
		Dicofol	0.51	0.02	25
Peppers	Egypt	Ethion	0.31	0.01	31
Litchis	Thailand	Carbendazim	2.13	0.1	21
		Cypermethrin	0.85	0.05	17
Chilli peppers	Thailand	Dicofol	0.41	0.02	20
		Carbendazim	1.75	0.1	17
		Profenofos	0.68	0.05	14
Pineapple	Ecuador	Carbaryl	0.34	0.02	17
Basil	Thailand	Acetamiprid	0.14	0.01	14
Coriander	Thailand	Chlorpyrifos	0.71	0.05	14
Litchis	Thailand	Carbendazim	1.35	0.1	13
Courgettes	Spain	Chlorothalonil	0.11	0.01	11
Oranges	USA	Carbaryl	0.52	0.05	10

EC co-ordinated programme

The EC co-ordinated programme for 2008 consisted of nine commodities and 78 pesticides (6). The minimum number of samples per commodity to be analysed by each of the member states was for multi-residue methods 15 to 93 depending on the population size in the MS. In Sweden the EC co-ordinated programme is a part of the national monitoring programme.

In all, 380 samples of beans, carotts, cucumbers, mandarins, oranges, pears, potatoes, spinach and rice were analysed (Table B in Part 2 of this report). Residues

above the EC-MRLs for the pesticides listed in Table B were found in 13 of the samples (Figure 3).

The EC co-ordinated programme included also analysis of at least 10 samples of baby foods and a number of samples from produce originating from organic farming. A total of 42 samples of different baby foods have been analysed (Table C in Part 2 of this report). None of the samples contained residues.

Finally, samples from products originating from organic farming should also be taken within the EC co-ordinated programme. In all, 13 samples were analysed, none of the samples contained any pesticide residues (Table A 1-Organic in Part 2 of this report).

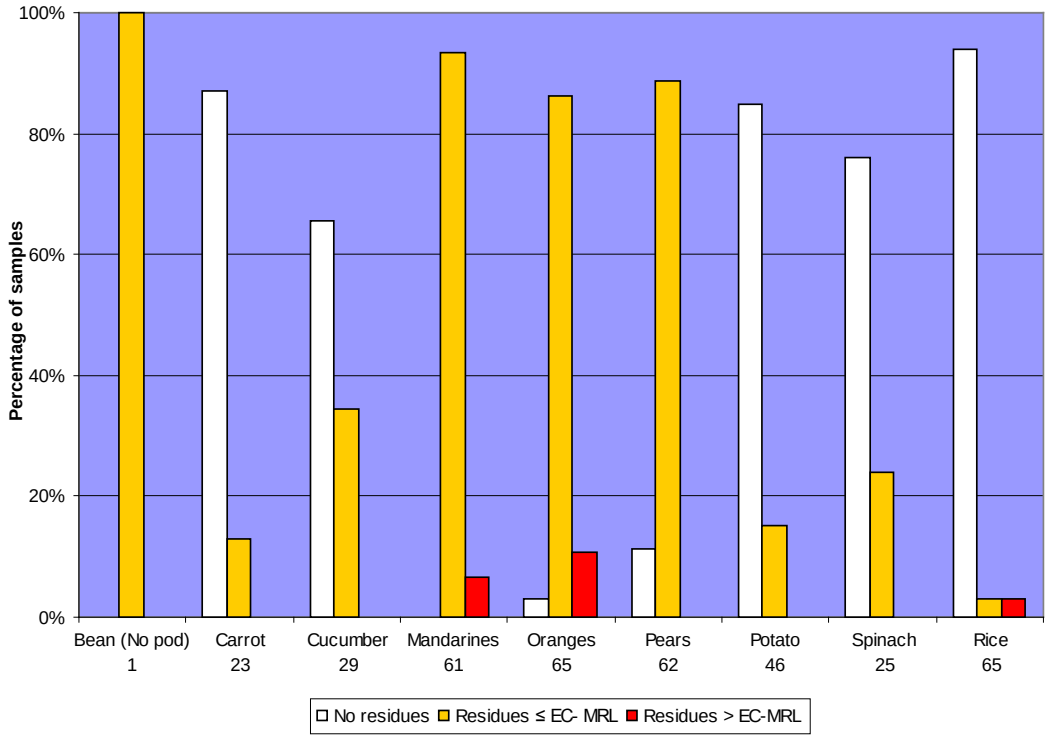

Figure 3. Summary of results for the EC co-ordinated programme, only EC-MRLs and pesticides included in Table B, surveillance sampling in 2008.

Violation rates of pesticide residues

The frequency of samples of fresh or frozen fruits and vegetables with pesticide residues above national or EC-MRLs is shown in Figure 4. The violation rate 2008 was 11 % in fresh or frozen fruits and vegetables from third countries and 3.6 % in the samples from EU countries except Sweden, compared to 9.5 % and 2.1 % in 2007. In 2008 none of the samples of domestically grown fruits and vegetables contained residues above the MRLs and this correspond to a decrease of the violation rate from 0.5 % to 0.0 %.

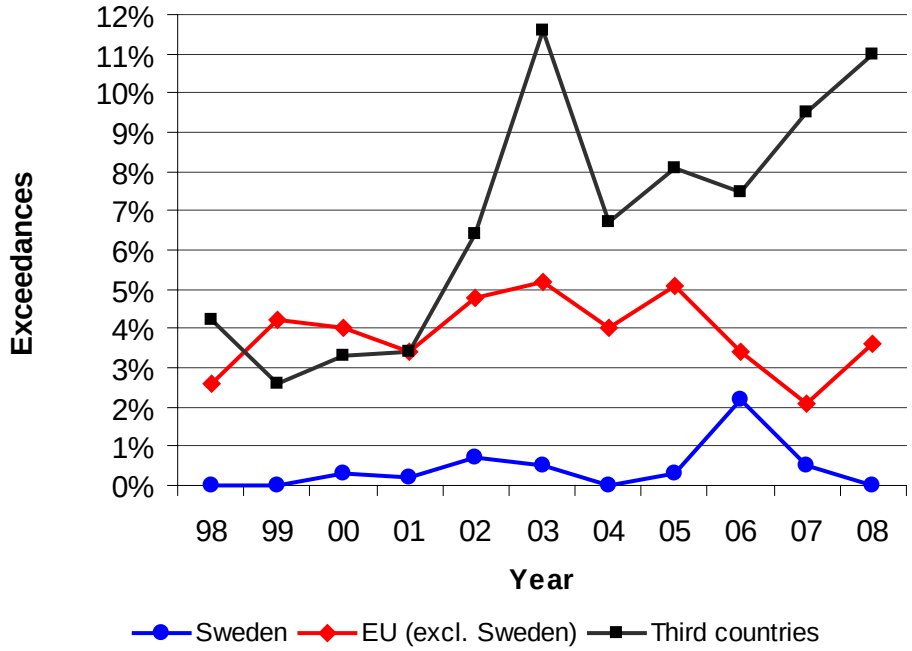

***Figure 4**. Violation rate of pesticide residues in samples of fresh or frozen fruits and vegetables, national or EC-MRLs, surveillance sampling during 1998–2008.*

Foods intended for infants and young children

In total, 42 samples of baby foods e.g. gruel, porridge, beverages, and fruit purées were analysed. No detectable residues were found in any of the samples (Table C in Part 2 of this report).

Juices and fruit drinks (excluding "baby food")

A total of 24 samples of juices were analysed and five of the samples contained residues. Four out of 14 samples of orange juice contained residues. Two of these samples contained carbendazim (0.02 mg/kg), two contained imazalil (0.06 and 0.01 mg/kg) and one contained orthophenylphenol (0.02 mg/kg). One out of ten samples of apple juice contained residues of carbendazim (0.03 mg/kg) and pirimicarb (0.01 mg/kg). Detailed information is given in Table C in Part 2 of this report.

Fruits and vegetables – processed or dried (except "baby food")

In all, 30 samples of dried fruits and canned or processed fruits and vegetables were analysed. Fifteen samples contained pesticide residues but none of the samples exceeded an EC-MRL (Table C in Part 2 in this report).

Vegetable oils

A total of 35 samples of olive oil, rape seed oil, sunflower oil, maize oil, and mixed oil were analysed for residues of 41 pesticides (method code 031). Metazachlor was

found in one of the samples of sunflower oil and fenvalerate was found in one of the samples of mixed oil (Table C in Part 2 of this report).

Cereal products

A total of seven samples of cereal products namely wheat flour, maize flour, bulgur, and other product were analysed. One of the samples contained residues of piperonyl butoxide and pirimiphos-methyl (Table C).

Cereal grains

In all, 279 samples of cereal grains, wheat, rice, rye, oats, and barley were analysed for residues of 106 pesticides. The growth regulator chlormequat and the herbicide glyphosate were the most frequently found pesticides (Table 4, Table C). Five of the samples exceeded the MRLs but most of the samples, 73 %, contained no residues at all (Figure 5).

Seven out of 65 samples of rice contained the insecticide inorganic bromide, at most 55 mg/kg. Residues of phosphine, hydrogen phosphide, piperonyl butoxide and eight other pesticides were also found in the samples of rice.

Chlormequat was found in 14 out of the 32 samples of rye, 0.68 mg/kg as the highest residue.

Out of 172 samples of wheat, 36 contained residues of 12 pesticides or metabolites. The most frequently found residues in wheat were glyphosate, pirimiphos-methyl, chlormequat and trinexapac, 0.87 mg/kg as the highest residue (Table C).

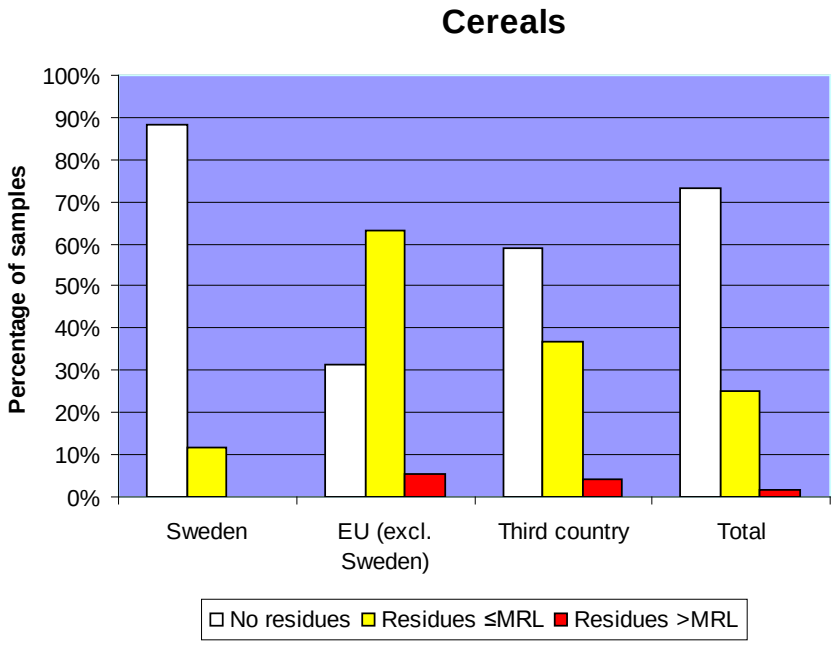

Figure 5. *Summary of results for cereal grains, national or EC-MRLs, surveillance sampling in 2008.*

Enforcement

Enforcement samples were collected as a follow-up, when excessive amounts of pesticide residues were found in surveillance samples. National and EC-MRLs were exceeded in 16 out of 64 enforcement samples (Appendix 5, Table A1-Part II and Tables D3-4).

A total of ten lots (11.5 tons) of foods were prohibited for sale in 2008 (Table 7), compared with seven lots (26.1 tons) in 2007 (4). These lots had either to be destroyed or returned to the supplier. A re-export is accepted only when the competent authority in the receiving country gives its approval. The number of samples analysed, grouped by commodity, country of origin and residues found, are shown in Appendix 5.

Table 7. Lots prohibited for sale in 2008

Commodity	Country	Pesticide	No of lots	Weigth (ton)
Passion fruit	Colombia	Dithiocarbamates	2	0.89
Oranges	USA	Carbaryl	1	1.66
Passion fruit	Kenya	Dithiocarbamates	2	1.40
Apples	Poland	Dimethoate	1	7.41
Chili	Thailand	Profenofos Prochloraz Carbofuran	1	0.03
Chili	Thailand	Profenofos	1	0.03
Long beans	Thailand	Dimethoate Indoxacarb Methomyl	1	0.01
Long beans	Thailand	Indoxacarb Methomyl	1	0.06
Total			**10**	**11.5**

Rapid Alert System

The Rapid Alert System for Food and Feed (RASFF) was established by Council Directive 92/59/EEC on General Product Safety. Products entailing a serious health risk to the consumer are classified as Alert notifications. The notifying Member State (MS) informs the Commission, which then notifies the other Member States.

Sweden has during 2008 sent four food-alarm concerning high pesticide residues to the Commission. The notifications were: carbaryl in apples from Uruguay (two notifications), omethoate/dimethoate in apples from Poland and carbaryl in celery from Thailand.

Dietary Exposure Assessment

Homogeneity (variability) factor
The homogeneity (variability) factor is defined as the quotient between the maximum and the mean residue of individual units in a sample.

Short-term intake
The acute dietary exposure or short-term intake has to be considered for those pesticides that are classified as acute toxic. Approaches how to estimate the acute intake has been put forward by WHO (7-9) and UK. NFA uses the acute reference doses (ARfD) established within the European Union or WHO (JMPR or JECFA) for pesticides that possibly impose an acute health risk (10). The acute reference dose of a chemical is an estimate of the amount a consumer can ingest during one meal or during one day without any health risk.

The type of foodstuffs of most concern when estimating the acute exposure are those where the entire commodity (including peel) is consumed at one occasion, e.g. nectarines, apples, pears or table grapes.

Calculation of estimated short-term intake
The national estimated short-term intake (NESTI) was calculated for each pesticide found and for which EU, JMPR or JECFA have established an acute reference dose using the formulae shown in Figure 6. The formulae (case 2) are used when the meal-sized portion, as a single fruit or piece of vegetable (unit weight of the whole portion is > 25 g) might have a higher concentration of residue than the composite sample due to variability of residues in individual units. When the residue data reflect residue levels in the food as consumed (case 1), no variability factor is considered (e.g. cereals, juices).

The consumption figures used when calculating the NESTI are based on the 97.5^{th} percentile consumption of eaters only, which reflects the largest portion consumed during one meal or during one day. Consumption data from EFSA's Pesticide Risk assessment Model (PRIMo) has been used.

Case 1: The composite residue data reflect residue levels in the food as consumed

$$NESTI = \frac{LP * ORcomp}{bw}$$

Case 2a: The unit weight of the whole commodity (U) is smaller than the large portion (LP)

$$NESTI = \frac{U * ORcomp * V + (LP - U) * ORcomp}{bw}$$

Case 2b: The unit weight of the whole commodity (U) is larger than the large portion (LP)

$$NESTI = \frac{LP * ORcomp * V}{bw}$$

NESTI	=	National estimated short-term intake
U	=	Median unit weight of the edible portion (kg)
OR_{comp}	=	Highest observed residue in a composite sample of edible portion incorporation processing factors if available (mg/kg)
V	=	Variability factor; 1 to 10 depending on unit weight and commodity
LP	=	Highest large portion provided (97.5th percentile of eaters) in kg of food per day
bw	=	Body weight (kg)

***Figure 6**. The formulae used for calculating the national estimated short-term intake.*

Results of the assessment of the national estimated short-term intake

Children, due to their low body weight relative to their consumption, compose a risk group of approaching the acute reference dose (ARfD) when the products contain high levels of acute toxic pesticides.

The national estimated short-term intake has been calculated for a large number of pesticides/commodity combinations. However, the results are shown only when the intake for a child/toddler is above 100 % of the ARfD (Table 10). The estimated short-term intake for a child exceeded the ARfD in eight cases; for *phosmet* in apples, *carbaryl* in apples and celery, *omethoate* in balsam pears, aubergines and apples, *oxamyl* in cucumbers.

In four cases the intake also exceeded the ARfD for adults (Table 10).

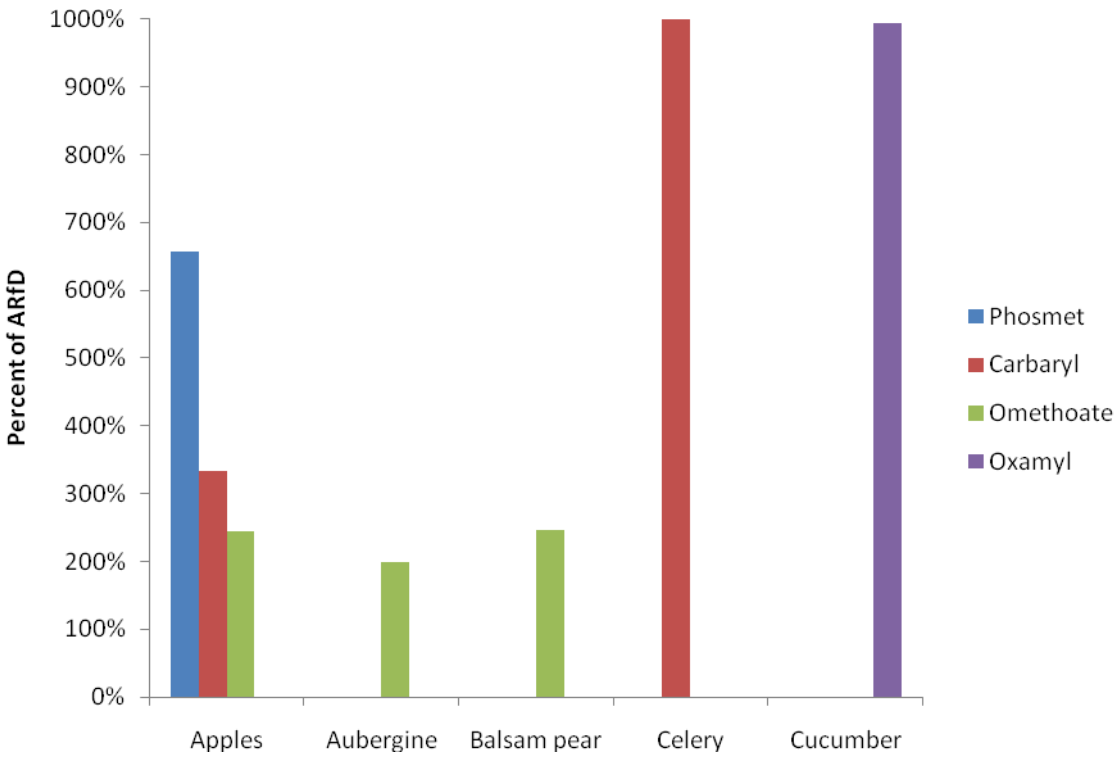

Figure 7*. Estimated short-term intakes above the acute reference dose for a child, surveillance sampling in 2008.*

Table 10. The estimated short-term intake of certain pesticides based on the highest residue found in composite samples in 2008. Only intakes above 100 % of the ARfD for a child are shown.

Pesticide	Commodity	ARfD* mg/kg bw	Source	Highest residue (mg/kg)	Correc-tion factor	Homo-geneity factor	Intake % of ARfD children	adults
Phosmet	Apples	0.045	COM	3.02	1	7	658	151
Carbaryl	Apples	0.01	EFSA	0.34	1	7	333	76
”	”	”		0.33	1	7	323	74
”	Celery	”		2.2	1	5	1010	375
Omethoate	Aubergine	0.002	EFSA	0.16	1	5	200	199
”	Balsam pear	”		0.084	1	5	246	83
”	Apples	”		0.05	1	7	245	56
Oxamyl	Cucumber	0.001	EFSA	0.17	1	5	994	335

*Reference 10

References

1. The National Food Administration's regulations on pesticide residues in food, SLVFS 2006:22. National Food Administration, Uppsala, Sweden.

2. Commission Directive 2003/13/EC amending Directive 96/5/EC on processed cereal-based foods and baby foods for infants and young children.

3. 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. OJ L187, 16.7.2002, 30-43.

4. Andersson A, Broman F and Jansson A. The Swedish monitoring of pesticide residues in food of plant origin: 2007. Rapport nr 5, 2008. National Food Administration, Uppsala, Sweden

5. Method Validation and Quality Control Procedures for Pesticide Residues Analysis in Food and Feed, Document No. SANCO/2007/3131.

6. 2008/103/EC, Commission recommendation of 4 February 2008 concerning a coordinated Community monitoring programme for 2008 to ensure compliance with maximum levels of pesticide residues in and on cereals and certain other products of plant origin and national monitoring programmes for 2009.

7. WHO (World Health Organization) 1997. Guidelines for predicting dietary intake of pesticide residues (revised), Prepared by the Global Environment Monitoring System - food contamination monitoring and assessment programme (GEMS/Food) in collaboration with the Codex Committee on Pesticide Residues, WHO/FSF/FOS/97.7. WHO, Geneva, Switzerland.

8. FAO/WHO. Pesticide Residues in food – 1999. Report of the joint meeting of the FAO panel of experts on pesticide residues in food and the environment and the WHO core assessment group on pesticide residues. Rome, Italy, 20-29 September 1999.

9. FAO/WHO. Pesticide residues in food-2001. Report of the joint meeting of the FAO panel of experts on pesticide residues in food and the environment and the WHO core assessment group on pesticide residues. Geneva, Switzerland, 17-26 September 2001.

10. EU Pesticides database, http://ec.europa.eu/sanco_pesticides/public/index.cfm.

Appendix 1. Analytical method codes and their sources

***Code 200*: Multi-residue method for fruits and vegetables using GC and LC-MS/MS determination**

Pihlström T, Ekroth S, Jansson C. An alternative procedure for extraction of pesticide residues from acidic crops. Poster presentation at 5th Nordic Pesticide Residue Workshop in Tallinn, 2003.

Jansson C, Pihlström T, Österdahl B.-G., Markides K. A new multi-residue method for analysis of pesticide residues in fruit and vegetables using liquid chromatography with tandem mass spectrometric detection. J. of Chromatography A, 1023 (2004) 93-104.

Pihlström T, Blomkvist G, Friman P, Pagard U, Österdahl B-G. Analysis of pesticide residues in fruit and vegetables with ethyl acetate extraction using gas liquid chromatography with tandem mass spectrometric detection. Anal. Bioanal. Chem. (2007) 389:1773-1789.

***Code 201:* LC-MS/MS multi method**

Jansson C. A multi-residue procedure applied to the analysis of benzoylphenylurea insecticides in fruit and vegetables by using LC-MS/MS, ES-. Not published, National Food Administration, Uppsala, Sweden.

***Code 008:* Dithiocarbamates**

Pihlström T. Determination of dithiocarbamates in fruits and vegetables using GC/FPD. Not published, National Food Administration, Uppsala, Sweden.

Harrington P. Analysis of dithiocarbamates by quantification of CS_2 using 2,2,4-trimethyl pentane method. Central Science Laboratory, York, UK.

***Code 009:* Diquat**

Kirsten W J. The determination of diquat residues in potato tubers. Analyst 1966;91:732–738.

Åkerblom M. Second derivative scanning in spectrophotometric determination of pesticide residues. Fourth International Congress of Pesticide Chemistry (IUPAC), Zürich, 1978. Abstract volume VI–701.

***Code 010:* Bromide, inorganic**

Rocklin R D, Johnsson E L. Determination of cyanide, sulfide, iodide, and bromide by ion chromatography with electrochemical detection. Analytical Chemistry 1983;55:4–7. Modified by the Swedish University of Agricultural Sciences, Department of Environmental Assessment, Uppsala, Sweden.

Lindgren B, Berglöf T, Ramberg Å, Stepinska A, and Åkerblom M. Liquid chromatographic determination of bromide ion in cereals, fruit, vegetables, and blood with a Silver electrode in an electrochemical detector system. JAOAC International 1995,78:841–845.

***Code 019:* Ethoxyquin**

Blomkvist G. Some examples of the use of GC/MS in the Swedish pesticide monitoring programme. (Determination of ethoxyquin and diphenylamine in apples and pears). Poster presented at the 7thAnnual California Pesticide Residue Workshop, March 12–17,1995. Sacramento, California.

Appendix 1. Cont.

Code 021: **Tin organic pesticides (code 014) incl. fenbutatin oxide**
Wåglund T. Determination of tin organic pesticides, including fenbutatin oxide. Not published, National Food Administration, Uppsala, Sweden.

Code 022: **Maleic hydrazide**
Wåglund T, Elgerud C. A liquid chromatographic method for the determination of maleic hydrazide in potatoes. Not published, National Food Administration, Uppsala, Sweden.

Code 030: **Chlormequat and mepiquat**
Ohlin B. Determination of chlormequat and mepiquat in fruit and vegetables using LC-MS/MS. Not published, National Food Administration, Uppsala, Sweden.

Alder L et al. Non fatty foods – determination of chlormequat and mepiquat- LC-MS/MS method. Proposed method for European Standard: CEN TC 275 WG 4, Doc N 146.

Code 031: **GC-MS/MS Multimethod for determination of pesticide residues in vegetable oils and oil seeds**
Pihlström T. Determination of pesticides in vegetable oils and oil seeds. Not published, National Food Administration, Uppsala, Sweden.

Code 909**: Hydrogen phosphide**
Ohlin B. Analytical method for determination of hydrogen phosphide residues in dry foodstuffs using GC headspace. Not published, National Food Administration, Uppsala, Sweden.

Code 913: **Glyphosate and AMPA**
Determination of glyphosate and its metabolite AMPA in cereals. Not published, Eurofins Food&Agro AB, Lidköping, Sweden.

Code 914: **GC-MS/MS multi method for cereals**
Ekroth S. Multi method for determination of pesticide residues in cereals using GC-MS/MS. Not published, National Food Administration, Uppsala, Sweden

Code 915: **LC-MS/MS multi method for cereals**
Ekroth S. Multi method for determination of pesticide residues in cereals using acetonitrile extraction and LC-MS/MS determination. Not published, National Food Administration, Uppsala, Sweden

Appendix 2. Analytes (active substances, isomers and breakdown products) sought and detected by commodity groups, surveillance sampling in 2008.

**: Analyte that act as an active substance (=pesticide) is marked with an asterisk*
■: *Analyte marked with bold and red was detected*
#: The analyte was detected in this food group
o: The analyte was sought in this food group but not detected
+: New analyte in the control
(+): Analyte re-introduced in the control
x: Analyte not individually determined

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Abamectin	*	o			
Acephate	*	#	o	o	
Acetamiprid	*	#			
Acibenzolar-S-methyl	*	o			
Aclonifen	*	#			
Acrinathrin	*	#			
Aldicarb	*	o			
Aldicarb-sulphone		o			
Aldicarb-sulphoxide		o			
Aldrin	*	o			
Aminocarb	*	o			
AMPA				#	
Anilazine	*	o			
Aspon	*	o			
Atrazine	*	o	o		
Atrazine-desethyl		o			
Atrazine-desisopropyl		o			
Azinphos-ethyl	*	o	o		
Azinphos-methyl	*	#	o	o	
Azocyclotin [a], see cyhexatin	*	**x**			
Azoxystrobin	*	#			
Benalaxyl	*	#			
Bendiocarb	*	o			
Benomyl [b], see carbendazim	*	**x**			
Bentazone	*	o			
Beta-cyfluthrin	*	o			
Bifenthrin	*	#		+	
Binapacryl	*	o			
Biphenyl	*	o			
Bitertanol	*	#			
Boscalid +	*	#			
Bromide (inorganic)	*	o		#	
Bromophos	*	o	o	o	
Bromophos-ethyl	*	o			

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Bromopropylate	*	#			
Bromoxynil	*			o	
Bupirimate	*	#			
Buprofezin	*	#			
Butocarboxim	*	o			
Butocarboxim-sulphoxide		o			
Butoxycarboxim	*	o			
Cadusafos	*	o			
Captafol	*	o			
Captan	*	#			
Carbaryl	*	#		o	
Carbendazim [b)]	*	#		#	
Carbofuran	*	#			
- **3-Hydroxycarbofuran**		#			
Carbophenothion	*	o			
Carbosulfan	*	#			
Carfentrazone-ethyl	*	o			
Carvone +	*	o			
Chinomethionat	*	o			
Chlorbromuron	*	o			
Chlordane	*				
-alpha		o			
-gamma		o			
Chlordimeform	*	o			
Chlorfenson	*	o			
Chlorfenvinphos	*	o	o	o	
Chlorfluazuron	*	o			
Chlormephos	*	o			
Chlormequat	*	#		#	
Chlorobenzilate	*	o			
Chloropropylate	*	o			
Chlorothalonil	*	#		o	
Chlorpropham	*	#			
Chlorpyrifos	*	#		o	
Chlorpyrifos-methyl	*	#	o	#	

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Chlorpyrifos-O-analogue		o			
Chlorthal-dimethyl	*	o			
Chlozolinate	*	o			
Clofentezine	*	#			
Clomazone	*	o			
Clothianidin	*	#			
Cyanazine	*	o			
Cyanofenphos	*	o			
Cyanophos	*	o			
Cyazofamid	*	o			
Cyfluthrin	*	o			
Cyhexatin [a)]	*	o			
Cypermethrin	*	#	o	#	
Cyproconazole	*	#			
Cyprodinil	*	#			
2,4-D	*	#		o	
Danifos	*	o			
DDT	*				
DDD-p,p		o		o	
DDE-p,p		o	o	o	
DDT-o,p		o		o	
DDT-p,p		o	o	o	o
Deltamethrin	*	#	o	#	
Demeton	*	o			
Demeton-S-methyl	*	o			
Demeton-S-methyl-sulphone		o			
Desmetryn	*	o			
Dialifos	*	o			
Diazinon	*	#		o	
Dichlobenil	*	o			
Dichlofluanid	*	o			
3,5-Dichloroaniline		#			
Dichlorprop	*			o	
Dichlorvos	*	o	o	o	
Dicloran	*	#			
Dicofol (p,p)	*	#			
Dicrotophos	*	o			
Dieldrin	*	#			
Diethofencarb	*	#			
Difenoconacole	*	#		#	
Diflubenzuron	*	#			
Dimethoate	*	#	o	o	
Dimethomorph	*	#			
Dinobuton	*	o			

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Dinocap	*	o			
Dinoseb	*	o			
Dinoterb	*	o			
Dioxathion	*	#			
DMSA +		o			
DMST +		o			
Diphenamid	*	o			
Diphenylamine	*	#			
Diquat	*	#			
Disulfoton	*	o			
Disulfoton-sulphone		o			
Ditalimfos	*	o			
Dithiocarbamates [c)]	(*)	#			
DNOC	*	o			
Endosulfan	*	(#)			
-alpha		o	o	o	
-beta		#	o	o	
- sulphate		#	o	o	
Endrin	*	o			
EPN	*	#			
Epoxiconazole	*	#			
Esfenvalerate	*	o			
Ethiofencarb	*	o			
Ethiofencarb-sulphone		o			
Ethiofencarb-sulphoxide		o			
Ethion	*	#	o		
Ethoxyquin	*	#			
Etofenprox	*	#			
Ethofumesate	*	o			
Ethoprophos	*	o			
Etrimfos	*	o		o	
Famoxadone	*	#			
Fenamiphos	*	o			
Fenamiphos-sulphone		o			
Fenamiphos-sulphoxide		o			
Fenarimol	*	#	o		
Fenazaquin	*	#			
Fenbuconazole	*	#			
Fenbutatin oxide	*	o			
Fenchlorphos	*	o			
Fenhexamid	*	#		+	
Fenitrothion	*	#	o	o	
Fenoxycarb	*	#			

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Fenpiclonil	*	o			
Fenpropathrin	*	#			
Fenpropimorph	*			#	
Fenpyroximate +	*	#			
Fenson	*	o			
Fensulfothion	*	o			
Fensulfothion-oxon +		o			
Fensulfothion-oxon-sulphone +		o			
Fensulfothion-sulphone +		o			
Fenthion	*	#	o	o	
Fenthion-sulphone		#	o		
Fenthion-sulphoxide		#	o		
Fenvalerate	*	#	#	#	
Fipronil	*	#		o	
Flamprop	*			o	
Florasulam	*			o	
Fluazifop-P-butyl	*	o			
Fluazinam	*	o			
Flucythrinate	*	o			
Fludioxonil	*	#			
Flufenoxuron	*	o			
Fluquinconazole	*	o			
Fluroxypyr	*			o	
Flusilazole	*	#			
Folpet	*	#			
Fonofos	*	o			
Formothion	*	o			
Fuberidazole	*			o	
Furalaxyl	*	o			
Furathiocarb	*	o			
Glyphosate	*			#	
Haloxifop +	*	#			
Haloxifop-2-ethoxyethyl +		o			
Haloxifop-R-methyl +		o			
HCH-alpha		o		o	
HCH-beta		o			
HCH-delta		o			
HCH-gamma (Lindane)	*	o	o	o	
Heptachlor	*	o			
Heptachlor epoxide		o			
Heptenophos	*	o			
Hexachlorobenzene	*	o			
Hexaconazole	*	#		o	
Hexaflumuron	*	o			

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Hexazinone	*	o			
Hexythiazox	*	#			
Hydrogen phosphide	*	o		#	
Imazalil	*	#			
Imidacloprid	*	#		#	
Indoxacarb +	*	#			
Iodofenphos	*	o			
Ioxynil +	*			o	
Iprodione	*	#	o	o	
Iprovalicarb	*	o			
Isocarbophos +	*	o			
Isofenphos	*	o			
Isofenphos-methyl +	*	o			
Isoprocarb	*	o			
Isopropalin	*	o			
Isoproturon	*	o			
Isoxaben	*	+		o	
Kresoxim-methyl	*	#		+	
Lambda-cyhalothrin	*	#	o	o	
Leptophos	*	o			
Linuron	*	#			
Lufenuron	*	#			
Malathion	*	#		#	
Malathion-O-analogue		o		o	
Maleic hydrazide	*	#			
Mancozeb[c], see dithiocarbamates	*	**x**			
Maneb[c], see dithiocarbamates	*	**x**			
MCPA	*			o	
Mecarbam	*	o			
Mecoprop	*			o	
Mepanipyrim +	*	#			
Mephosfolan	*	o			

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Mepiquat	*	o		#	
Metalaxyl	*	#	o	o	
Metazachlor	*		#		
Methabenzthiazuron	*	o			
Methacrifos +	*			o	
Methamidophos	*	#		o	
Methidathion	*	#	o		
Methiocarb	*	#			
Methiocarb-sulphone		o			
Methiocarb-sulphoxide		#			
Methomyl	*	#			
Methoprene	*			o	
Methoxychlor	*	o	o	o	
Metribuzin	*	o			
Mevinphos	*	o			
Monocrotophos	*	#			
Myclobutanil	*	#			
Napropamide	*	o			
Nitrofen	*			o	
Omethoate	*	#			
Orthophenylphenol	*	#			
Oxadixyl	*	**o**			
Oxamyl	*	**o**			
Oxamyl oxime		#			
Oxydemeton-methyl	*	o			
Oxydisulfoton	*	o			
Paraoxon		o			
Paraoxon-methyl		o			
Parathion	*	#	o		
Parathion-methyl	*	o	o		
Penconazole	*	#		+	
Pencycuron	*	o			
Pendimethalin	*	#			
Pentachloroaniline		o			
Pentachloroanisole		o			
Pentachlorobenzene		o			
Permethrin	*	#		o	
Phenmedipham +	*	#			
Phenothrin	*	o			

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Phenthoate	*	#			
Phorate	*	o			
Phorate-O-analogue		o			
Phorate-sulphone		o			
Phorate-sulphoxide		o			
Phosalone	*	#			
Phosmet	*	#			
Phosmet-O-analogue		o			
Phosphamidon	*	o			
Phosphine , see hydrogen phosphide					
Piperonyl butoxide	*	#		#	
Pirimicarb	*	#			
Pirimicarb-desmethyl				o	
Pirimicarb-desmethyl-formamido				o	
Pirimiphos-ethyl	*	o			
Pirimiphos-methyl	*	o		#	
Prochloraz	*	#	o	o	
Procymidone	*	#		o	
Profenofos	*	#			
Promecarb	*	o			
Propamocarb	*	#			
Propaquizafop	*	o			
Propargite	*	#			
Propetamphos	*	o			
Propham	*	#			
Propiconazole	*	#		#	
Propineb[c], see dithiocarba-mates	*	**x**			
Propoxur	*	o			
Propyzamide	*	#			
Prosulfocarb	*	o			
Prothioconazole	*			o	
Prothiofos	*	#			
Pymetrozine +	*	#			
Pyraclofos	*	o			
Pyraclostrobine	*	#		o	
Pyrazophos	*	o			
Pyrethrins	*			#	

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Pyridaben	*	#			
Pyridaphenthion	*	o			
Pyrifenox	*	#			
Pyrimethanil	*	#			
Pyriproxyfen	*	#			
Quinalphos	*	#			
Quinoxyfen	*	#			
Quintozene	*	o			
Quizalofop	*	o			
Simazine	*	o			
Spinosad	*	#			
Spiroxamine	*	#			
Sulfentrazone	*	o			
Sulfotep	*	o			
2,4,5-T	*			o	
Tau-fluvalinate	*	#			
2,3,5,6-TCA		o			
2,3,4,5-TCNB		o			
Tebuconazole	*	#	o	o	
Tebufenozide	*	#			
Tebufenpyrad	*	#			
Tecnazene	*	o			
Teflubenzuron	*	o			
TEPP	*	o			
Tepraloxydim	*	o			
Terbufos	*	o			
Terbufos-oxon +		o			
Terbufos-O-sulphone		o			
Terbufos-O-sulphoxide +		o			
Terbufos-sulphone +		o			
Terbufos-sulphoxide +		o			
Terbuthylazine	*	#			
Terbutryn	*	o			
Tetrachlorvinphos	*	o			
Tetraconazole	*	#			
Tetradifon	*	o			
Tetrasul	*	o			

Analyte sought	Active substance	Fruits, vegetables	Oil seeds, oils	Cereal grains	Animal prod.
Thiabendazole	*	#			
Thiacloprid +	*	#			
Thiamethoxam	*	#			
Thiodicarb	*	o			
Thiometon	*	o		o	
Thiometon-sulphone		o		o	
Thiometon-sulpoxide		o			
Thionazin	*	o			
Thiophanate-methyl	*	#		o	
Thiram[c], see dithiocar-bamates	*	**x**			
Tolclofos-methyl	*	o			
Tolylfluanid	*	o			
Triadimefon	*	#	o	o	
Triadimenol	*	#		o	
Triamiphos	*	o			
Triazamat	*	o			
Triazophos	*	#		+	
Tribenuron-methyl	*			o	
2,4,6-Tribromoanisole		o			
2,4,6-Tribromophenol	*	#			
Trichlorfon	*	o			
Trichloronat	*	o			
Trifloxystrobin	*	#			
2,4,6-Trichlorophenol		o			
Triflumizole	*	#			
Triflumuron	*	#			
Trimethacarb	*				
2,3,5-Trimethacarb		o			
3,4,5-Trimethacarb		o			
Trinexapac (acid)				#	
Trinexapac-ethyl	*			o	
Vamidothion	*	o			
Vamidothion-sulphone		o			
Vamidothion-sulphoxide		#			
Vinclozolin	*	#	o	o	
Zineb[c], see dithiocarbamates	*	**x**			

[a)] cyhexatin includes the active substance azocyclotin

[b)] carbendazim includes the active substance benomyl

[c)] dithiocarbamates include the active substances mancozeb, maneb, propineb, thiram and zineb.

Appendix 3. Number of surveillance samples of food of plant origin grouped by analytical methods, 2008.

Code	Method	No. of analytes	No. of samples				No. of determi-nations
			Fruits and vegetables (fresh or frozen)	**Cereal grains**	**Processed and dried products**	**Sum**	
008	Dithiocarbamates (as CS_2)	1	218			218	*218*
009	Diquat	1	21			21	*21*
010	Bromide (inorganic)	1		48	6	54	*54*
019	Ethoxyquin	1	52			52	*52*
021	Tin organic pesticides	2	65			65	*130*
022	Maleic hydrazide	1	10			10	*10*
030	Chlormequat and mepiquat	2	45	119	3	167	*334*
031*	GC-MS/MS Multimethod: vegetable oils	50			35	35	*1 750*
200*	GC-MS/MS+LC-MS/MS (ES+) Multimethod: fruits and vegetables	325	1 119		91	1 210	*393 250*
201*	LC-MS/MS(ES-) Multi-method: fruits and vegetables	12	183		12	195	*2 340*
909	Hydrogen phosphide	1		116	7	123	*123*
913	Glyphosate and AMPA	2		80	2	82	*164*
914*	GC-MS/MS Multimethod: cereals	44		69	5	74	*3 256*
915*	LC-MS/MS Multimethod: cereals	76		279	12	291	*22 116*
	Total number of analyses		**1 713**	**711**	**173**	**2 597**	
	Total number of deter-minations						***423 818***

* classified as a multi-residue method (MRM)

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a*) import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
APPLES	IMPORT a)	106	25	6	7	ACETAMIPRID	1	2		0.1
						AZINPHOS-METHYL	2		1	0.5
						BIFENTHRIN	2			0.3
						CARBARYL	1	1	4	0.05
						CARBENDAZIM (SUM)	7	3		0.2
						CHLORPYRIFOS	3			0.5
						DIPHENYLAMINE	2			5.0
						DIMETHOATE (SUM)		2	1	0.02
						ENDOSULFAN (SUM)	2			0.05
						FOLPET + CAPTAN	3			3.0
						METHOMYL (SUM)	1			0.2
						PENDIMETHALIN		1		0.05
						PHOSMET (SUM)		1		0.2
						THIABENDAZOLE	8			5.0
						VAMIDOTHION			1	0.01
APPLES	SWEDEN	31	9	4		CARBENDAZIM (SUM)	9	4		0.2
						PIRIMICARB	1			0.5
						PYRACLOSTROBIN	1			0.3
ARTICHOKES	IMPORT	1								
ASPARAGUS	IMPORT	2		1		CHLORPYRIFOS		1		0.05
AVOCADOS	IMPORT	2								
BANANAS	IMPORT	50	3			BIFENTHRIN	2			0.1
						IMAZALIL	1			2.0
BASIL	IMPORT	7		2	5	ACETAMIPRID			1	0.01
						CARBARYL	1			1.0
						CARBENDAZIM (SUM)	2		1	0.1
						CARBOFURAN (SUM)			2	0.02
						CHLORPYRIFOS		1	4	0.05
						CYPERMETHRIN	1	1	1	2.0
						FENVALERATE			1	0.02
						FLUSILAZOLE			1	0.02
						METHOMYL (SUM)		1		2.0
						PROFENOFOS		1	1	0.05
BEANS (WITH PODS)	IMPORT	26		1	4	CARBOFURAN (SUM)			1	0.02
						CHLORPYRIFOS			1	0.05
						DIMETHOATE (SUM)		2	1	0.02
						FAMOXADONE			1	0.02
						METALAXYL (SUM)			1	0.05

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a*) import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
						METHOMYL (SUM)		1		0.05
						PROFENOFOS			2	0.05
						PYRACLOSTROBIN			1	0.02
BEANS (WITH PODS)	SWEDEN	5								
BEANS (WITHOUT PODS)	IMPORT	1	1			CHLORPYRIFOS	1			0.05
BEET ROOTS	IMPORT	4			1	PHENMEDIPHAM			1	0.1
BEET ROOTS	SWEDEN	6								
BROCCOLI	IMPORT	5	1			BIFENTHRIN	1			0.2
BROCCOLI	SWEDEN	6								
BRUSSELS SPROUTS	SWEDEN	1								
CARAMBOLAS	IMPORT	1								
CARROTS	IMPORT	10		2		BOSCALID	2			0.5
						CHLORPYRIFOS-METHYL	1			0.05
						DITHIOCARBAMATES		1		0.2
						PYRACLOSTROBIN		1		0.1
CARROTS	SWEDEN	16								
CELERY	IMPORT	1								
CELERY	SWEDEN	1								
CELERY LEAVES	IMPORT	1			1	CARBARYL			1	0.05
						QUINALPHOS			1	0.05
CHERRIES	IMPORT	15								
CHERRIES	SWEDEN	1								
CHILI PEPPERS	IMPORT	19	1		8	ACEPHATE		1		0.02
						CARBENDAZIM (SUM)			1	0.1
						CARBOFURAN (SUM)			1	0.02
						CARBOSULFAN			1	0.05
						CHLORPYRIFOS			1	0.5
						DELTAMETHRIN	1			0.2
						DIFENCONAZOLE			1	0.05
						DICOFOL (SUM)			3	0.02
						DIMETHOATE (SUM)			3	0.02
						ETHION			1	0.01
						FENPROPATHRIN			1	0.01
						HYDROXYCARBOFURAN, 3-			1	0.01
						IMIDACLOPRID	1			1.0
						METHAMIDOPHOS			1	0.01
						METHIOCARB (SUM)	1		1	0.1
						METHOMYL (SUM)	1			0.2

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a*) import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
						PERMETHRIN			1	0.05
						PROFENOFOS			1	0.05
						THIAMETOXAM (SUM)	1			0.5
						TRIAZOPHOS			3	0.01
CHINESE CABBAGES	IMPORT	14	1	1	3	DIMETHOATE (SUM)			3	0.02
						FENHEXAMID		1		0.05
						VINCLOZOLIN (SUM)	1			2.0
CHINESE CABBAGES	SWEDEN	6								
CORIANDER	IMPORT	4			3	CARBOFURAN (SUM)			1	0.02
						CHLORPYRIFOS			1	0.05
						CYPERMETHRIN	1			2.0
						PROFENOFOS			2	0.05
						PROCHLORAZ		1		5.0
						PROPICONAZOLE			1	0.05
COURGETTES	IMPORT	10		2	2	ALDRIN+DIELDRIN		1	1	0.05
						CHLORTHALONIL			1	0.01
						METHOMYL (SUM)		1		0.05
COURGETTES	SWEDEN									
CUCUMBERS	IMPORT	15	2	2		ACETAMIPRID		1		0.3
						FAMOXADONE		1		0.2
						METALAXYL (SUM)	1			0.5
						PENCONAZOLE		1		0.1
						PYMETROZINE	1			0.5
						TRIADIMEFON		1		0.1
CUCUMBERS	SWEDEN	14								
CUCUMBERS, OTHER	IMPORT	1			1	DIMETHOATE (SUM)			1	0.02
DILL	IMPORT	1		1		MALATHION (SUM)		1		0.02
						THIAMETOXAM (SUM)	1			0.05
EGG PLANTS	IMPORT	14	2		4	CARBARYL			1	0.05
						CHLORPYRIFOS	1			0.5
						CYPERMETHRIN	2			0.5
						DIMETHOATE (SUM)			2	0.02
						EPN			1	0.01
						ETHION			2	0.01
						TRIADIMEFON (SUM)	1			0.1
FENNEL	IMPORT	6	1	1		DICLORAN	1			0.1
						LINURON	1	1		0.1
FENNEL	SWEDEN	5	1			LINURON	1			0.1

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a*) import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
FIGS	IMPORT	3		1		CYPERMETHRIN		1		0.05
FRUIT, OTHER	IMPORT	1								
GRAPEFRUITS	IMPORT	2	2			CHLORPYRIFOS	1			0.3
						IMAZALIL	2	2		5.0
GROUND CHERRIES	IMPORT	2	2			PYRIMETHANIL	1			0.05
						TEBUCONAZOLE	1			0.05
KIWI FRUITS	IMPORT	3								
KUMQUATS	IMPORT	1								
LEEKS	IMPORT	8		1		METHOMYL (SUM)		1		0.05
LEEKS	SWEDEN	5								
LEMONS	IMPORT	3		1		IMAZALIL		1		5.0
						PARATHION		1		0.05
LETTUCE, ICEBERG	IMPORT	2								
LETTUCE, ICEBERG	SWEDEN	4								
LETTUCE, OTHERS	IMPORT	7	1			AZOXYSTROBIN	1			3.0
						FOLPET	1			2.0
LETTUCE, OTHERS	SWEDEN	11								
LIMES	IMPORT	1								
LITCHIS	IMPORT	15	2		4	AZOXYSTROBIN		1		0.05
						CARBARYL	1		1	0.05
						CARBENDAZIM			3	0.1
						CHLORPYRIFOS	1		1	0.05
						CHLOROTHALONIL			1	0.01
						CYPERMETHRIN	1	1	2	0.05
						DITHIOCARBAMATES		1	1	0.05
						METALAXYL (SUM)			1	0.05
						PERMETHRIN	1			0.05
						PROCYMIDONE		1		0.02
LONGAN	IMPORT	1			1	CARBENDAZIM (SUM)			1	0.1
						CYPERMETHRIN			1	0.05
						DIMETHOATE (SUM)			1	0.02

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a*) import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
MANDARINS	IMPORT	61	27	22	4	BROMOPROPYLATE	2			2.0
						DICOFOL (SUM)	3			2.0
						DIOXATHION	1			0.05
						ENDOSULFAN (SUM)			1	0.05
						FAMOXADONE		1		0.02
						IMAZALIL	28	18	3	5.0
						LAMBDA-CYHALOTHRIN	1			0.2
						MALATHION (SUM)	1	1		2.0
						METHIDATHION	1			5.0
						PROCHLORAZ (SUM)	1	1		10.0
						THIABENDAZOLE	16	3		5.0
						VINCLOZOLIN (SUM)	1			0.05
MANGOES	IMPORT	15	1	2		CARBENDASIM		1		0.1
						CYPERMETHRIN	1			0.05
						THIABENDAZOLE		1		5.0
MELONS	IMPORT	15	3			BENALAXYL	1			0.1
						CARBENDAZIM (SUM)	1			0.1
						ENDOSULFAN (SUM)	1			0.05
						THIOPHANATE-METHYL	1			0.3
MUSHROOMS, CULTIVATED	IMPORT	10								
NECTARINES	IMPORT	17	4			CHLORPYRIFOS	1			0.2
						IPRODIONE	2			3.0
						PROPICONAZOLE	1			0.05
ONIONS	IMPORT	24	1	1		KRESOXIM-METHYL		1		0.05
						TEBUCONAZOLE	1			0.05
ONIONS	SWEDEN	6								
ORANGES	IMPORT	65	34	13	7	BROMOPROPYLATE	1			2.0
						CARBARYL			1	0.05
						CARBENDAZIM (SUM)	1			0.5
						CHLORPYRIFOS	8	4		0.3
						DELTAMETHRIN	1			0.05
						DIAZINON		1	2	0.01
						DIMETHOATE (SUM)			2	0.02
						FENITROTHION			2	0.01
						IMAZALIL	31	9		5.0
						LAMBDA-CYHALOTHRIN	1			0.1
						ORTHOPHENYLPHENOL		1		12
						PROCHLORAZ (SUM)	1			10

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a*) import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
PAPAYAS	IMPORT	15	1	2	6	CLOFENTEZINE		1		0.02
						DITHIOCARBAMATES			1	0.05
						FAMOXADONE			1	0.02
						METHOMYL (SUM)		1		0.05
PARSLEY	IMPORT	1			1	ETOFENPROX			1	3.0
PARSNIPS	SWEDEN	2								
PASSION FRUITS	IMPORT	10	1	1	5	CARBENDAZIM (SUM)	2			0.1
						CYPERMETHRIN	1	1		0.05
						DELTAMETHRIN		1		0.05
						DIFENCONAZOLE		1	1	0.1
						DITHIOCARBAMATES			3	0.05
						PROCHLORAZ (SUM)	1			0.05
						PYRIMETHANIL			1	0.05
						TRIFLOXYSTROBIN		2	1	0.02
PEACHES	IMPORT	21	2	2		CARBENDAZIME (SUM)	1			0.2
						CHLORPYRIFOS	1			0.2
						IPRODIONE		1		3.0
						VINCLOZOLIN (SUM)		1		0.05
PEARS	IMPORT	61	15	9	1	ACETAMIPRID	9	4		0.1
						AZINPHOS-METHYL	3			0.05
						CARBENDAZIM (SUM)	2	1		0.2
						CHLOTHIANIDIN	1			0.05
						FENPYROXIMATE	3			0.3
						FENVALERATE			1	0.02
						FOLPET + CAPTAN	2			3.0
						INDOXACARB (SUM)	1			0.3
						IPRODIONE	1			5.0
						LAMBDA-CYHALOTHRIN	1			0.1
						PHOSMET (SUM)		1		0.2
						PYRACLOSTROBIN		1		0.3
						PYRIMETHANIL	1			2.0
						THIABENDAZOLE	4	1		5.0
						THIACLOPRID	2			0.3
						THIOPHANATE-METHYL		1		0.5
PEARS	SWEDEN	1								
PEPPERS	IMPORT	21			1	ETHION			1	0.01

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a) *import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
PERSIMMONS	IMPORT	12	3	3		BIFENTHRIN			1	0.05
						CHLORPYRIFOS	1			0.05
						ETOFENPROX	1			1.0
						IPRODIONE		1		0.02
						LAMBDA-CYHALOTHRIN	1	1		0.02
PINEAPPLES	IMPORT	16	2		1	CAPTAN			1	0.02
						CARBARYL			1	0.05
						CYPERMETHRIN	1			0.05
						PROCHLORAZ (SUM)	1			5.0
						TRIADIMEFON (SUM)	1			3.0
PLUMS	IMPORT	3								
POMEGRANATES	IMPORT	16	3	2	7	ACETAMIPRID			1	0.01
						BIFENTHRIN		1		0.05
						CARBENDAZIM (SUM)	4	1	1	0.1
						CHLORPYRIFOS	2			0.05
						CYPERMETHRIN			2	0.05
						FENVALERATE			1	0.02
						LAMBDA-CYHALOTHRIN		1	2	0.02
						METHOMYL (SUM)			1	0.05
POTATOES	IMPORT	16	2			DIQUAT	2			0.05
						PYRIFENOX (1+2)			1	0.01
POTATOES	SWEDEN	30	8			DIQUAT	8			0.05
PRICKLY PEAR	IMPORT	2								
RAMBUTAN	IMPORT	1								
RUCCOLA	IMPORT	1								
SCORZONERA	IMPORT	1								
SPINACH	IMPORT	12	2	1		CHLORPYRIFOS	1			0.05
						DITHIOCARBAMATES		1		0.05
						PHENMEDIFHAM	1			0.05
SPINACH	SWEDEN	13	1			CARBENDAZIM (SUM)	1			0.1
STRAWBERRIES	IMPORT	15	1	3		BUPIRIMATE	1			1.0
						CARBENDAZIM (SUM)	2			0.1
						KRESOXIM-METHYL		1		1.0
						PROFENOFOS		1		0.05
						PYRACLOSTROBIN	1			0.5
						TIOPHANATE-METHYL		1		0.1
STRAWBERRIES	SWEDEN	25								
SWEET CORN (COBS)	IMPORT	4								

Appendix 4. Number of surveillance samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

a*) import = EU-countries except Sweden + third countries*

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
SWEET CORN (KERNELS)	IMPORT	2								
TABLE GRAPES	IMPORT	81	6	1	2	ACETAMIPRID			1	0.01
						CARBENDAZIM (SUM)	1			0.3
						CHLORPYRIFOS	3			0.5
						FENHEXAMID		1		5.0
						LAMBDA-CYHALOTHRIN		2		0.2
						THIOPHANATE-METHYL			1	0.1
						TRIADIMEFON (SUM)	1			2.0
TOMATOES	IMPORT	30	7	3	1	ACETAMIPRID	1	1		0.1
						BIFENTHRIN	1			0.2
						CYPERMETHRIN	1			0.5
						FLUSILAZOLE		1		0.02
						METHIOCARB (SUM)			1	0.1
						PYRACLOSTROBIN	1			0.2
						PYRIDABEN	1			0.3
						PYRIMETHANIL	2			1.0
						PYRIPROXYFEN	2			0.3
						TRIADIMEFON (SUM)	1	1		0.3
						TRIFLOXYSTROBIN	1			0.5
TOMATOES	SWEDEN	16								
VEGETABLES, NOT CLASSIFI	IMPORT	1								
WATER SPINACH	IMPORT	1			1	CYPERMETHRIN			1	0.5
WINTERSQUASH	SWEDEN	1								
All samples		**1119**	**177**	**91**	**77**					
			(26%)	**(11.50%)**	**(8.5%)**					

Appendix 5. Number of enforcement samples analysed and pesticide levels found in fresh or frozen fruit and vegetables in 2008

Commodity	Origin	Number of samples				Pesticide	Number of samples			MRL (mg/kg)
		Total	within intervals in % of MRL				within intervals in % of MRL			
			20-50	51-100	>100		20-50	51-100	>100	
APPLES	BRASIL	6								
APPLES	POLAND	3								
APPLES	USA	1								
AUBERGINES	EGYPT	1	1			CYPERMETHRIN	1			0.5
BASIL	THAILAND	2			1	CARBENDAZIM (SUM)			1	0.1
						CHLORPYRIFOS			1	0.05
BEANS (WITH PODS)	KENYA	3	1	1		CARBENDAZIM (SUM)		1		0.2
						THIOPHANATE-METHYL	1	1		0.1
BEANS (WITH PODS)	THAILAND	5	1	1	3	DIMETHOATE (SUM)			3	0.02
						INDOXACARB (SUM)			1	0.02
						IPROVILACARB	1			0.05
						CARBARYL		1		0.05
						CARBENDAZIM (SUM)	2	1		0.2
						METALAXYL (SUM)		1		0.05
						METHOMYL (SUM)	1	1	1	0.05
						TRIADIMEFON (SUM)	1			0.1
CHILLI PEPPERS	INDIA	1		1		LAMBDA-CYHALOTHRIN		1		0.1
CHILLI PEPPERS	THAILAND	2			2	DELTAMETHRIN	1			0.2
						DIMETHOATE (SUM)			1	0.02
						CARBARYL		1		0.05
						CARBENDAZIM (SUM)			1	0.05
						CARBOFURAN (SUM)			1	0.1
						CARBOSULFAN		1	1	0.02
						CHLORPYRIFOS	1	1		0.5
						METHOMYL (SUM)		1		0.2
						PERMETHRIN	1			0.05
						PROPHAM	1			0.05
						PROFENOFOS			2	0.05
						PROCHLORAZ			1	0.05
						PYRACLOSTROBINE	1			0.5
CHINESE CABBAGE	GERMANY	1		1		DIMETHOATE (SUM)		1		0.02
						METALAXYL (SUM)	1			0.05
CORIANDER	THAILAND	4		1	2	IPROVILACARB		1		0.05
						CARBENDAZIM (SUM)			2	0.1
						CHLORPYRIFOS		1		0.05

ORANGES	BRASIL	2	1		1	DIMETHOATE (SUM)			1	0.02
						IMAZALIL	2			5.0
						CARBENDAZIM (SUM)	2			0.5
ORANGES	EGYPT	12	3	3		DIAZINON		1		0.01
						DIMETHOATE (SUM)		2		0.02
						IMAZALIL	6			5.0
						THIABENDAZOLE	3			5.0
PAPAYAS	BRAZIL	3		1		FAMOXADONE		1		0.02
PEPPERS	TURKEY	5		2		ACETAMIPRID	1			0.3
						METHOMYL (SUM)		1		0.2
						OXAMYL		1		0.02
PASSION FRUITS	COLOMBIA	9		3	5	DITHIOCARBAMATES		2	4	0.05
						LAMBDA-CYHALOTHRIN			1	0.02
						PROCYMIDONE		1	1	0.02
PASSION FRUITS	KENYA	3			2	DITHIOCARBAMATES			2	0.05
WATER SPINACH	THAILAND	1								
All samples		**64**	**7**	**14**	**16**					
			(11%)	**(22%)**	**(25%)**					