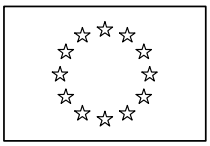

COMMISSION OF THE EUROPEAN COMMUNITIES

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PART I

COMMISSION STAFF WORKING DOCUMENT

Monitoring of Pesticide Residues in Products of Plant Origin in the European Union, Norway, Iceland and Liechtenstein

2003

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1. INTRODUCTION

This report covers the national situations with regard to pesticide residues monitoring for the calendar year 2003 in the 15 EU Member States and the three EFTA States who have signed the EEA agreement[1] (Norway, Iceland and Liechtenstein). By its nature as a summary, this document gives an overall view of the monitoring of pesticide residues. More detailed information about the situation in individual countries is available from the respective national monitoring authorities and can be requested from them. To complement the data, Member States and the EEA States contribute a short national statement (in English) for inclusion in this document (see Annex I). The issue of pesticide residues in foodstuffs of animal origin, as regulated in Council Directive 86/363/EEC[2], is not covered by this report.

2. LEGAL BASE

In Council Directives 86/362/EEC[3] and 90/642/EEC[4], as amended, maximum levels are fixed for pesticide residues in and on products of plant origin. Member States are asked to check regularly the compliance of foodstuffs with these levels. Inspections and monitoring should be carried out in accordance with the provisions of Council Directive 89/397/EEC[5] on the official control of foodstuffs, and Council Directive 93/99/EC[6] on additional measures concerning the official control of foodstuffs. From January 2003, Member States should have implemented Commission Directive 2002/63/EC[7] 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.

Besides national monitoring programmes, the Commission services recommended, via Commission Recommendation 2002/663/EC[8], the participation of each Member State in a specific EU co-ordinated monitoring programme. These programmes began in 1996. Their aim is to work towards a system which makes it possible to estimate actual dietary pesticide exposure throughout Europe. The monitoring programme was designed as a rolling programme covering major pesticide-commodity combinations in a series of 5-year cycles and the first cycle was completed in 2000. This 2003 report is the third report of the second cycle, which is designed as a 3-year cycle. The time span was reduced to 3 years in order to have a picture of the dietary intake situation after a shorter period of time. The choice of commodities includes the major components of the Standard European Diet of the World Health Organisation.

Article 7 of Council Directive 86/362/EEC and Article 4 of Council Directive 90/642/EEC, as amended by Council Directive 97/41/EC[9], require Member States to report to the Commission the results of the monitoring programme for pesticide residues carried out both under their national programme and under the EU co-ordinated programme. A common format for the

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1 Agreement on the European Economic Area
2 Official Journal No L 221, 07/08/1986 p. 0043 - 0047
3 Official Journal No L 221, 07/08/1986 p. 0037 - 0042
4 Official Journal No L 350, 14/12/1990 p. 0071 - 0079
5 Official Journal No L 186, 30/06/1989 p. 0023 - 0026
6 Official Journal No L 290, 24/11/1993 p. 0014 - 0017
7 Official Journal No L 187, 16/07/2002 p. 0030 - 0043
8 Official Journal No L 225, 22/08/2002 p. 0029 - 0033
9 Official Journal No L 184, 12/07/1997 p. 0033 - 0049

reports on the Community programme was agreed in document SANCO/4/2004. The Commission is required to compile and collate the information, annually.

Commission Regulation (EC) No 645/2000[10] provides for detailed implementing rules for the monitoring provisions of Directives 86/362/EEC and 90/642/EEC.

3. MAXIMUM RESIDUE LIMITS (MRL), ACCEPTABLE DAILY INTAKES (ADI) AND ACUTE REFERENCE DOSES (ACUTE RFD)

Pesticide residue levels in foodstuffs are generally regulated in order to:

- minimise the exposure of consumers to the harmful intake of pesticides;
- control the correct use of pesticides in terms of the authorisations or registrations granted (application rates and pre-harvest intervals);
- permit the free circulation within the EU of products treated with pesticides as long as they comply with the MRLs fixed.

A maximum residue limit (MRL) for pesticide residues is the maximum concentration of a pesticide residue (expressed in mg/kg) legally permitted in or on food commodities and animal feed. MRLs are based on Good Agricultural Practice (GAP) data. Foods derived from commodities that comply with the respective MRLs are intended to be toxicologically acceptable. Exceeded MRLs are indicators of violations of Good Agricultural Practice. If MRLs are exceeded, comparison of the exposure with acceptable daily intake (ADI) and/or acute reference dose (acute RfD) will then indicate whether or not there are possible chronic or acute health risks, respectively.

The acceptable daily intake (ADI) is the estimate of the amount of a substance in food, expressed on a body-weight basis, that can be ingested daily over a lifetime without appreciable health risk to the consumer. The ADI is based on the no observed adverse effect levels (NOAEL) in animal testing. A safety factor that takes into consideration the type of effect, the severity or reversibility of the effect, and the inter- and intra-species variability is applied to the NOAEL. The ADI therefore reflects chronic toxicity.

The acute Reference Dose (acute RfD) is the estimate of the amount of a substance in food, expressed on a body-weight basis, that can be ingested over a short period of time, usually during one meal or one day, without appreciable health risk to the consumer. It therefore reflects the acute toxicity. At present, acute Reference Doses have been fixed for a limited number of pesticides.

4. NATIONAL MONITORING PROGRAMMES

4.1. Monitoring results for 2003

The overall results of the 18 national monitoring programmes are shown in Tables 1 - 6. In total for the EU and EEA as a whole, about 47,500 samples were analysed. Member States analysed for as many as 519 different pesticides. 58 % of the samples contained no detectable pesticide residues. Detectable residues at or below the MRL were found in 37 % of the

[10] Official Journal No. L 78, 29/03/2000, p. 0007 - 0009

samples. In 5.1 % of the samples, the residues exceeded MRLs (both national and EC-MRLs). The reported data show that there were confirmed exceedances[11] of EC-MRLs in 3.3 % of all samples (sum of fresh, frozen and processed products).

The results vary significantly between the different countries. It is important to note that differences between countries in the actual presence of pesticide residues can exist, but that differences in the monitoring programmes as such are very likely to account for an important part of the variation.

Several factors can cause these differences in the monitoring programmes:

- The choice of pesticides investigated in different commodities
- Sampling, e.g. more random or more targeted and the proportion of domestic and imported foodstuffs
- Methods used, e.g. the use of single methods to detect specific, often problematic pesticides
- Analytical capabilities of the laboratories (differences in reporting levels)
- Definition of exceeded levels (e.g. including or excluding analytical uncertainty)
- Differences in national MRLs, leading to differences in exceeded levels reported

Surveillance sampling versus follow-up enforcement sampling

Surveillance and follow-up enforcement sampling are distinguished, since a different sampling strategy (more or less targeted) can lead to considerably different results, due to the more targeted nature of the follow-up enforcement sampling.

In the guidance document (SANCO/4/2004) for reporting the results of the 2003 national and Community monitoring programmes to the European Commission, surveillance and follow-up enforcement sampling were defined as follows:

Surveillance sampling means that samples are collected without any particular suspicion towards a particular producer, consignment, etc. Surveillance sampling may also include more targeted samples, which are directed to a special problem, e.g. methamidophos in peppers or chlormequat in pears from countries where previously problems were found. Samples directed towards a special producer or consignment, however, fall within the category of follow-up enforcement sampling.

Follow-up enforcement sampling means that samples are taken in case of suspicion, as a follow-up for previously found violations. Follow-up enforcement sampling is directed to a specific grower/producer or to a specific consignment. Samples directed towards a specific problem, but not to a specific producer/consignment fall within the category of surveillance sampling.

Tables 1A and 1B give a general overview of surveillance and follow-up enforcement sampling and the number of samples taken for fresh (incl. frozen)[12] and processed products, respectively.

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11 The definition of confirmed exceedances varies between Member States, this includes for example cases where the analytical laboratory has certified an exceedance when applying its quality assurance system, cases where official warnings have been issued or where legal or administrative consequences have followed.

In Tables 2-6 the detailed results by country are shown. Table 2 gives a summary of all samples taken (fruit, vegetables and cereals, including both surveillance and follow-up enforcement samples). Table 3 and 4 relate to surveillance sampling only – for fruit and vegetables and for cereals, respectively. Table 5 shows follow up enforcement samples for fruit and vegetables only (as there were only 22 follow-up enforcement samples for cereals, of which 20 were without residues). Table 6 relates to processed products (surveillance sampling only, since there were only 7 follow-up enforcement samples for processed products, of which 6 had residues at or below the MRL and 1 was without residues). In Tables 2 and 3 the total sample numbers including processed products are given in the last row of the tables.

Table 1A: Overview of the samples analysed in 2003 in the EU and EEA States - Breakdown by surveillance and follow-up enforcement samples

Total number of samples analysed in EU and EEA	47460	
Surveillance samples	46759	98.5%
Follow-up enforcement samples	701	1.5%

Table 1A shows that 98.5 % of the samples were surveillance samples and 1.5 % were follow-up enforcement samples – the same proportions as in 2002.

As Tables 3 and 5 for fruit and vegetables show, the more targeted nature of follow-up enforcement sampling leads to a higher percentage of MRL exceedances on these samples (19 % compared to 5.6 % in the surveillance sampling).

Surveillance sampling of fresh fruit/vegetables versus surveillance sampling of cereals

For cereals, 2785 samples were analysed (Table 4), compared to 40,041 samples for fruit and vegetables (Table 3). A more restricted group of pesticides (average 134) was analysed for cereals compared to fruit and vegetables (average 185) and the percentage of pesticides found as a share of those sought was lower (average of 6 %, compared to an average of 43 % for fruit and vegetables). Details of the pesticides most often found in both product groups are given in Table 8 (page 19).

The percentage of samples without residues was considerably higher in cereals (75 %) than in fresh fruit and vegetables (55%). Consequently, the percentage of samples with residues at or below the MRL and exceeding the MRL was lower in cereals at 24 % and 0.9 %, respectively, compared to 39 % and 5.6 % (respectively) in fruit and vegetables.

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[12] In this report fresh fruit and vegetables always include frozen fruit and vegetables, although this is not explicitly mentioned everywhere in the text.

Fresh versus processed products

Table 1B: Overview of the samples analysed in 2003 in the EU and EEA states - Breakdown by **fresh (incl. frozen)** and **processed** products

Total number of samples analysed in EU and EEA	47460	
Fresh fruit and vegetables	40709	86 %
Cereals	2807	6 %
Processed products	3944	8 %

As indicated in Table 1B, 92 % of the samples taken in the EU and the EEA States were fresh (incl. frozen) fruit, vegetables and cereals. At 8%, the share of processed products is the same as in 2002.

Out of 18 countries, 14 took samples of processed products, one country more than in 2002, with the highest shares attributable to the UK (which took 19.5 % of all the processed products samples) and the Netherlands (18%) (Table 6, page 14).

Comparing processed products with fresh products [13] the percentage of surveillance samples with residues at or below the MRL (national or EC-MRL) and with residues exceeding the MRL (national or EC-MRL) is significantly lower in processed products. Residues at or below the MRL were found in 22 % of the samples, compared to 39 % in fresh products; residues exceeding the MRL were found in 1.6 % of the samples, compared to 5.6 % in fresh products. As a consequence, the percentage of samples without residues is significantly higher in processed products (76 % compared to 55 % in fresh products).

Directives 86/362/EEC and 90/642/EEC contain general provisions for dried, processed and composite products, which specify that, in the absence of a specific MRL, the MRL for the fresh product shall be applied, taking into account concentration or dilution factors caused by processing. Specific MRLs for processed products may or may not have been set at the national level and the general provisions of Directives 86/362/EEC and 90/642/EEC are applied differently by Member States.

Since the number of surveillance samples of processed products was low (3933 samples) compared to fresh products (42,826 samples) the statistics do not change much when processed products are included in the overall table, Table 2, (last row) and in Table 3 (last row) for fruit and vegetables.

[13] In both tables surveillance sampling only

Table 2: Results of the eighteen national monitoring programmes[14] for pesticide residues on **fresh (incl. frozen) fruit, vegetables and cereals, sum of surveillance and enforcement** samples. The results **including processed products** are shown in the **last row** of the table.

	No. of samples analysed	**Maximum No. of pesticides analysed for**	**No. of different pesticides found**	**% found from sought**	**No. of samples without detec-table residues**	**%**	**No. of samples with residues below or at MRL (national or EC MRLs)**	**%**	**No. of samples with residues above MRL (national or EC MRLs)**	**%**	**No. of samples with confirmed residues above EC-MRLs**	**%**
B	1250	131	47	36	684	55	514	41	52	4.2	34	2.7
DK	1530	148	81	55	825	54	661	43	44	2.9	42	2.7
D	10586	519	246	47	4520	43	5177	49	889	8.4	404	3.8
EL	1659	108	48	44	1273	77	349	21	37	2.2	37	2.2
E	3670	191	86	45	2411	66	1095	30	164	4.5	146	4.0
F	3372	236	99	42	1672	50	1465	43	235	7.0	156	4.6
IRL	1022	87	45	52	607	59	379	37	36	3.5	38	3.7
I	7172	286	130	45	4957	69	2093	29	122	1.7	85	1.2
L	107	58	11	19	54	50	51	48	2	1.9	0	0.0
NL	2549	379	147	39	1072	42	1110	44	367	14.4	194	7.6
A	1404	257	85	33	962	69	386	27	56	4.0	37	2.6
P	363	129	33	26	220	61	109	30	34	9.4	26	7.2
FIN	1725	170	80	47	947	55	662	38	116	6.7	104	6.0
S	2131	228	101	44	1066	50	917	43	148	6.9	138	6.5
UK	2452	149	68	46	1611	66	817	33	24	1.0	24	1.0
Norway	2164	172	77	45	1372	63	742	34	50	2.3	46	2.1
Iceland	313	40	22	55	190	61	119	38	4	1.3	4	1.3
Liechten-stein	47	42	16	38	33	70	13	28	1	2.1	1	2.1
Total	43516	185	79	43	24476	56	16659	38	2381	5.5	1516	3.5
Total *incl. processed products*	**47460**	**185 (Average)**	**79 (Average)**	**43**	27654	58	17373	37	2433	5.1	1557	3.3

[14] See the explanation about the differences in monitoring results by country under chapter 4.1.

Table 3: Results of the eighteen national monitoring programmes for pesticide residues on **fresh (incl. frozen) fruit, vegetables, surveillance sampling only.** The results including **processed products** are shown in the **last row** of the table.

	No. of samples analysed	Maximum No. of pesticides analysed for	No. of different pesticides found	% found from sought	No. of samples without detectable residues	%	No. of samples with residues below or at MRL (national or EC MRLs)	%	No. of samples with residues above MRL (national or EC MRLs)	%	No. of samples with confirmed residues above EC-MRLs	%
B	1200	131	47	36	638	53	510	43	52	4.3	34	2.8
DK	1373	148	81	55	707	51	623	45	43	3.1	41	3.0
D	9775	519	246	47	4004	41	4903	50	868	8.9	389	4.0
EL	1620	108	48	44	1241	77	342	21	37	2.3	37	2.3
E	3246	191	86	45	2020	62	1069	33	157	4.8	140	4.3
F	2877	236	99	42	1437	50	1254	44	186	6.5	129	4.5
IRL	894	87	45	52	501	56	361	40	32	3.6	34	3.8
I	6782	286	130	45	4604	68	2056	30	122	1.8	85	1.3
L	88	58	11	19	47	53	39	44	2	2.3	0	0.0
NL	2477	379	147	39	1033	42	1083	44	361	14.6	189	7.6
A	1322	257	85	33	889	67	378	29	55	4.2	36	2.7
P	297	129	33	26	175	59	89	30	33	11.1	25	8.4
FIN	1536	170	80	47	847	55	593	39	96	6.3	84	5.5
S	1794	228	101	44	843	47	838	47	113	6.3	104	5.8
UK	2359	149	68	46	1578	67	757	32	24	1.0	24	1.0
Norway	2062	172	77	45	1304	63	712	35	46	2.2	42	2.0
Iceland	300	40	22	55	177	59	119	40	4	1.3	4	1.3
Liechten-stein	39	42	16	38	25	64	13	33	1	2.6	1	2.6
Total	40041	**185**	**79**	**43**	22070	55	15739	39	2232	5.6	1398	3.5
Total *incl. processed products*	43974	**185 (Average)**	**79 (Average)**	**43**	25243	57	16447	37	2284	5.2	1439	3.3

Table 4: Results of the eighteen national monitoring programmes for pesticide residues on **cereals, surveillance sampling only.**

	No. of samples analysed	Maximum No. of pesticides analysed for	No. of different pesticides found	% found from sought	No. of samples without detectable residues	%	No. of samples with residues below or at MRL (national or EC MRLs)	%	No. of samples with residues above MRL (national or EC MRLs)	%	No. of samples with confirmed residues above EC-MRLs	%
B	50	28	3	10.7	46	92	4	8	0	0.0	0	0.0
DK	157	83	12	14.5	118	75	38	24	1	0.6	1	0.6
D	660	478	42	8.8	442	67	211	32	7	1.1	6	0.9
EL	35	82	6	7.3	31	89	4	11	0	0.0	0	0.0
E	402	86	7	8.1	382	95	17	4	3	0.7	3	0.7
F	248	140	7	5.0	125	50	123	50	0	0.0	0	0.0
IRL	92	87	5	5.7	85	92	6	7	1	1.1	1	1.1
I	390	259	13	5.0	353	91	37	9	0	0.0	0	0.0
L	19	58	0	0.0	7	37	12	63	0	0.0	0	0.0
NL	48	379	3	0.8	30	63	18	38	0	0.0	0	0.0
A	82	245	6	2.4	73	89	8	10	1	1.2	1	1.2
P	63	127	5	3.9	44	70	19	30	0	0.0	0	0.0
FIN	109	151	6	4.0	70	64	29	27	10	9.2	10	9.2
S	244	42	10	23.8	182	75	61	25	1	0.4	1	0.4
UK	68	28	3	10.7	14	21	54	79	0	0.0	0	0.0
Norway	97	101	5	5.0	68	70	29	30	0	0.0	0	0.0
Iceland	13	0	0	0	13	100	0	0	0	0.0	0	0.0
Liechtenstein	8	42	0	0	8	100	0	0	0	0.0	0	0.0
Total	**2785**	**134 (Average)**	**7 (Average)**	**6**	**2091**	**75**	**670**	**24**	**24**	**0.9**	**23**	**0.8**

Table 5: Results of the eighteen national monitoring programmes for pesticide residues on **fresh (incl. Frozen) fruit and vegetables, enforcement sampling only.**

	No. of samples analysed	No. of samples without detectable residues	%	No. of samples with residues below or at MRL (national or EC MRLs)	%	No. of samples with residues above MRL (national or EC MRLs)	%	No. of samples with confirmed residues above EC-MRLs	%
B	0	0	0	0	0	0	0	0	0
DK	0	0	0	0	0	0	0	0	0
D	145	68	47	63	43	14	9.7	9	6.2
EL	4	1	25	3	75	0	0.0	0	0.0
E	22	9	41	9	41	4	18.2	3	13.6
F	247	110	45	88	36	49	19.8	27	10.9
IRL	20	7	35	11	55	2	10.0	2	10.0
I	0	0	0	0	0	0	0	0	0
L	0	0	0	0	0	0	0	0	0
NL	24	9	38	9	38	6	25.0	5	20.8
A	0	0	0	0	0	0	0	0	0
P	3	1	33	1	33	1	33.3	1	33.3
FIN	80	30	38	40	50	10	12.5	10	12.5
S	93	41	44	18	19	34	36.6	33	35.5
UK	25	19	76	6	24	0	0.0	0	0.0
Norway	5	0	0	1	20	4	80.0	4	80.0
Iceland	0	0	0	0	0	0	0	0	0
Liechtenstein	0	0	0	0	0	0	0	0	0
Total	**668**	**295**	**44**	**249**	**37**	**124**	**19**	**94**	**14**

Table 6: Results of the eighteen national monitoring programmes for pesticide residues in **processed products, surveillance sampling only.**

	No. of samples analysed	No. of samples without detec-table residues	%	No. of samples with residues below or at MRL (national or EC MRLs)	%	No. of samples with residues above MRL (national or EC MRLs)	%	No. of samples with confirmed residues above EC-MRLs	%
B	26	19	73	7	27	0	0.0	0	0.0
DK	54	42	78	11	20	1	1.9	1	1.9
D	36	31	86	5	14	0	0.0	0	0.0
EL	427	224	52	195	46	8	1.9	8	1.9
E	0	0	0	0	0	0	0	0	0
F	3	2	67	1	33	0	0.0	0	0.0
IRL	0	0	0	0	0	0	0	0	0
I	516	373	72	139	27	4	0.8	0	0.0
L	0	0	0	0	0	0	0	0	0
NL	542	446	82	71	13	25	4.6	21	3.9
A	74	66	89	8	11	0	0.0	0	0.0
P	49	44	90	5	10	0	0.0	0	0.0
FIN	382	321	84	53	14	8	2.1	6	1.6
S	213	175	82	36	17	2	0.9	1	0.5
UK	648	495	76	153	24	0	0.0	0	0.0
Norway	86	85	99	1	1	0	0.0	0	0.0
Iceland	0	0	0	0	0	0	0	0	0
Liechten-stein	1	1	100	0	0	0	0.0	0	0.0
Total	**3057**	**2324**	**76**	**685**	**22**	**48**	**1.6**	**37**	**1.2**

4.2. Results of the 2003 national monitoring programmes compared to the previous years

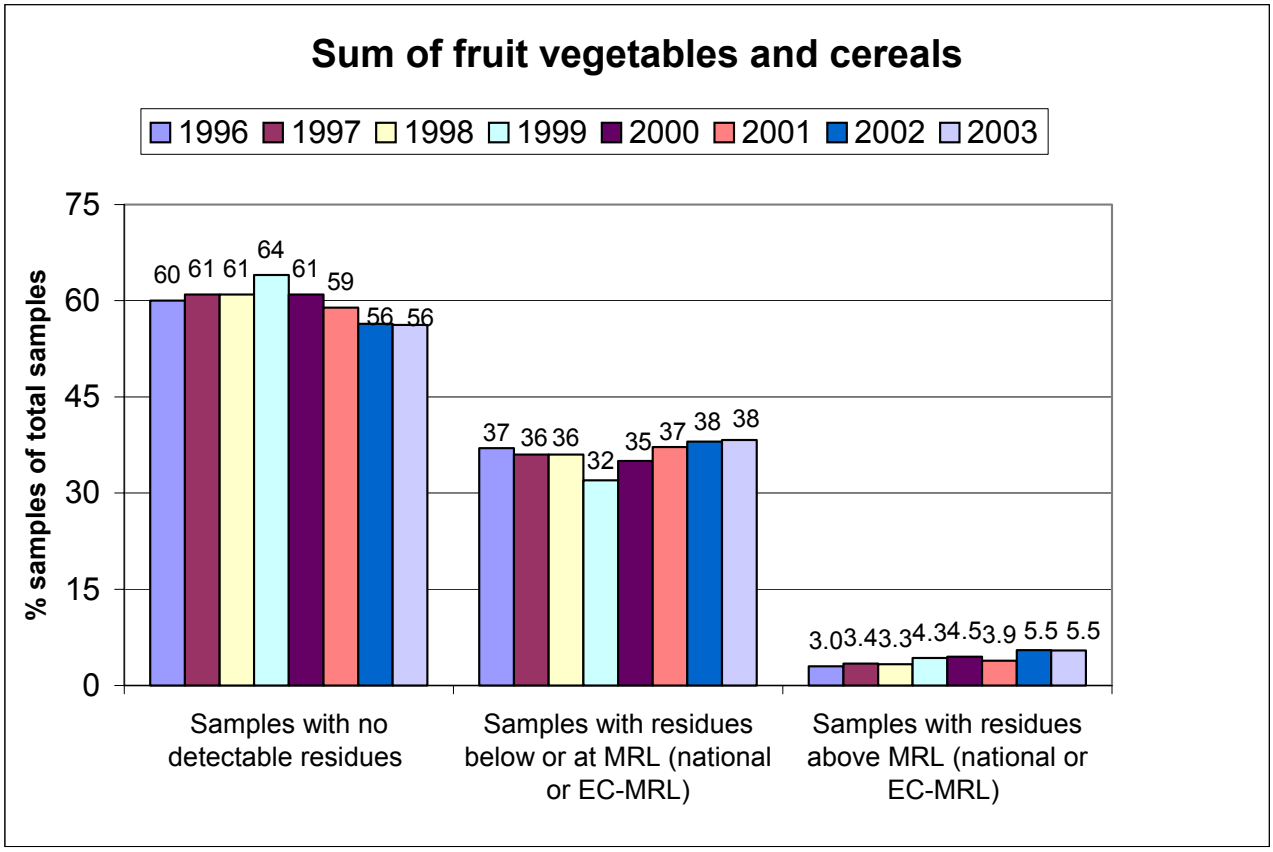

Figure 1: National monitoring results 1996 – 2003 for fruit, vegetables and cereals (sum of surveillance and follow-up enforcement sampling, fresh (incl. frozen) products only) collected in 18 participating countries

Figure 1 gives an overview of the trend in the residue situation since 1996. Only the results for fresh (incl. frozen) fruit, vegetables and cereals are shown, since processed products have not always been reported in previous years. There is no clearcut trend in the occurrence of residues over the entire 7-year period. However, it can be seen that the trend in the period 1999 to 2002 (towards an increased percentage of samples with detectable residues and a consequent fall in the % of samples with no detectable residues) has not continued in 2003. The situation is exactly the same as in 2002.

The figure shows that the percentage of samples with no detectable residues remained at the same level in the years 1996 - 1998 (60 - 61 %), then increased to 64 % in 1999. After this peak, the % has decreased steadily so that in 2002 and again in 2003 the percentage of samples with no detectable residues is at 56%.

The % of samples with residues above the MRL (national or EC-MRL) remains the same as 2002, at 5.5 %.

A number of factors might have contributed to the evolution shown in Fig. 1: first of all, as outlined in chapter 4.1, the national monitoring programmes differ considerably from year to year. In most countries, priorities for the monitoring programmes are set annually at national level and are often targeted at specific problems, such as for instance the information received on infringements in the EU (e.g. disseminated via the Rapid Alert System for Food and Feed (RASFF)) and on their national territory detected in their previous years' programmes. The

more information that is available and the more effectively information systems (such as the RASFF) work, the more precisely the programmes can detect potential problems.

Secondly, the quality of the analytical laboratories is constantly improving towards lower detection limits and lower reporting levels, towards enhanced capability to analyse more active ingredients and towards development and use of more specific single residue methods. In 1997, on average 126 active ingredients were analysed, ranging from 28 to 130 in the different countries. In 2001 the average figure was 145 (ranging from 32 to 314), while in 2003 it is 185 (ranging from 40 to 519). The progress in the implementation of the EU QC procedures, made in most of the participating countries, may also have contributed to improvements in the analytical capability and results.

Thirdly, the legislative situation has changed rapidly in recent years and will change in future with more MRLs set to the Limit of determination (LOD)[15], which could potentially result in more MRL exceedances.

Finally, comparability of the 1996 - 2003 data is somewhat limited also by the fact that the number of countries included in the reports was not the same over the period.

4.3. Samples with multiple residues

Table 7 shows that residues of more than one pesticide were found in about 20 % of the analysed samples. In most of these cases, (10 %), residues of two pesticides were found, while 5 % of samples contained residues of three pesticides. The percentage of samples with four or more residues, at 5.6% is higher than in previous years (5.4 % in 2002; and 2%, 2.2 % and 2.8 % in 1998, 1999 and 2000 respectively).

15 LOD is the limit of determination, also known as limit of quantification, it is the minimum concentration or mass of the analyte that can be quantified with acceptable precision (EU Quality Control procedures for pesticides residues).

Table 7: Samples with residues of more than one pesticide in fresh (incl. frozen) fruit, vegetables and cereals, sum of surveillance and follow-up enforcement sampling

	No. of samples analysed	2	3	4	5	6	7	8 and more	No. of samples with multiple residues	%
B	1250	83	37	20	3	5	2	1	151	12.1
DK	1530	160	99	53	26	9	1	1	349	22.8
D	10586	1348	803	488	284	210	94	168	3395	32.1
EL	1659	68	11	8	2	0	0	0	89	5.4
E	3670	170	90	23	4	2	0	0	289	7.9
F	3372	402	185	101	59	26	15	12	800	23.7
IRL	1022	92	33	3	0	0	1	0	129	12.6
I	7172	518	234	106	52	25	9	12	956	13.3
L	107	8	3	1	0	0	0	0	12	11.2
NL	2549	397	203	116	62	37	24	21	860	33.7
A	1404	69	42	40	16	14	4	4	189	13.5
P	363	31	11	4	1	0	0	0	47	12.9
FIN	1725	195	119	52	15	4	1	0	386	22.4
S	2131	276	120	49	28	3	2	0	478	22.4
UK	2452	245	100	28	12	4	0	0	389	15.9
Norway	2164	247	91	39	4	1	0	0	382	17.7
Iceland	313	28	15	8	3	2	0	0	28	8.9
Liechten -stein	47	2	0	0	0	0	0	0	2	4.3
Total	**43516**	**4339**	**2196**	**1139**	**571**	**342**	**153**	**219**	**8931**	**20.5**
%		**10.0**	**5.0**	**2.6**	**1.31**	**0.79**	**0.35**	**0.503**		

Samples with multiple residues in the years 1996 - 2003

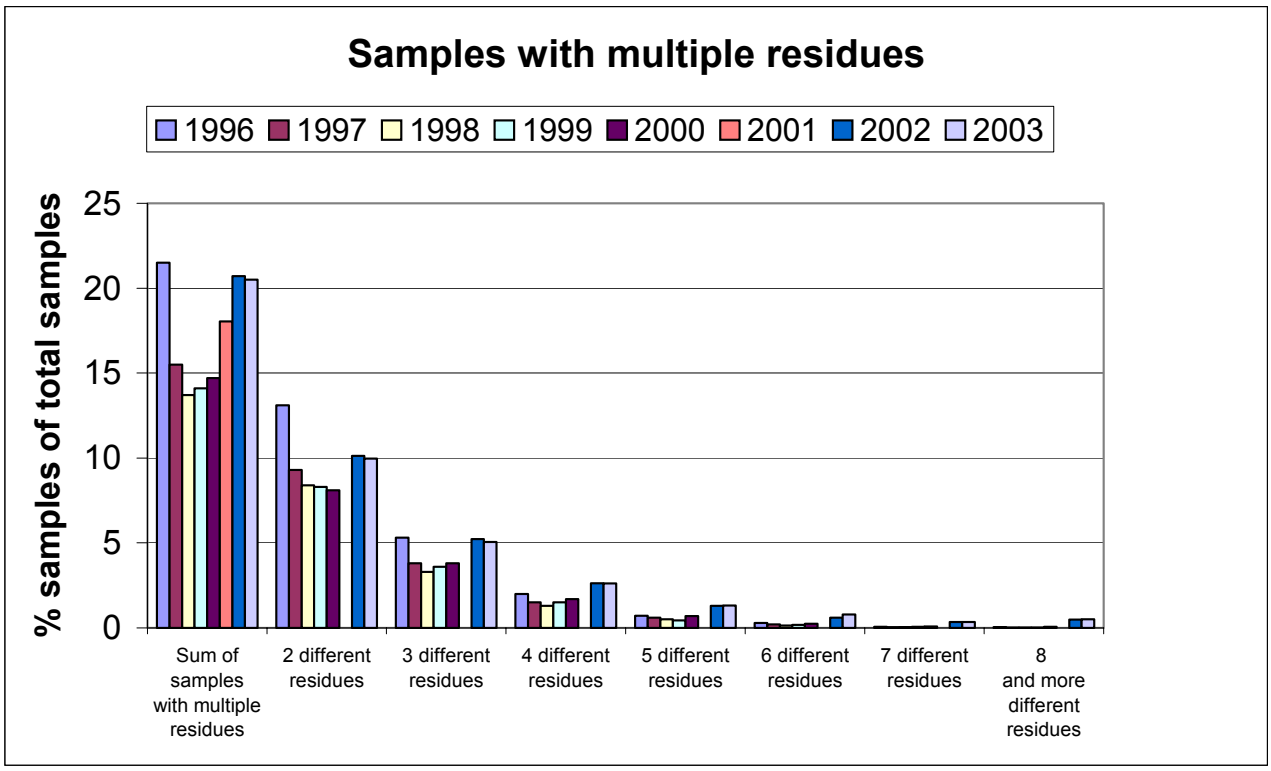

Figure 2: Samples with multiple residues - Comparison of the years 1996 - 2003, fresh (incl. frozen) fruit, vegetables and cereals only, sum of surveillance and enforcement sampling – In 2001 Italy provided only the total number of samples with multiple residues and for this reason detailed data are missing.

Figure 2 gives an overview of the distribution of samples with multiple residues in the years from 1996 to 2003. To facilitate comparison, only fresh fruit, vegetables and cereals have been taken into account. The chart shows that the proportion of samples with multiple residues decreased from 1996 to 1998, which can be seen throughout the different groups (e.g. samples with 2 residues, samples with 3 residues, etc.). From 1999 to 2002, the proportion increased, but in 2003 there has been a slight decrease, overall.

However, when evaluating these data, it must be noted that the results are not directly comparable over the period: in 1996 only eleven countries delivered data for this overview, in 1997 and 1998 fifteen countries, in 1999 sixteen countries and from 2000 onwards all eighteen countries delivered data.

Furthermore, factors outlined in chapter 4.2 are also relevant to explain an increased trend in detection of multiple residues.

4.4. Most frequently found pesticides

The pesticides which have been most frequently found in the national monitoring programmes are shown in Table 8, in decreasing order of relative frequency. The Member States, Norway, Iceland and Liechtenstein were asked to prepare a list of the ten most frequently found pesticides in decreasing order of frequency. This list was established by calculating the percentages of the findings of each pesticide in relation to the total number of samples analysed for this specific pesticide. The data are as reported by the respective country.

Table 8: Pesticides found most often in the national (incl.co-ordinated) monitoring programmes in the European Union, Norway, Iceland and Liechtenstein for a) fruit and vegetables and b) cereals, as reported.

Country	Pesticides found most often. The last row lists the pesticides mentioned most often from all Member States and Norway, Iceland and Liechtenstein	
	Fruit and vegetables	**Cereals**
B	Chlorpropham, Prochloraz, Bromide ion, Chlormequat, Imazalil, Maneb group, Propamocarb, Iprodione, Cyprodinil, and Benomyl group	Malathion, Bromide ion and Pirimiphos-methyl
DK	Chlormequat, Imazalil, Chlorpyrifos, Maneb-group, Iprodione, Procymidone, Pyrimethanil, Phenylphenol 2-, Thiabendazole and Cyprodinil	Chlormequat, Pirimiphos-methyl, Deltamethrin, Mepiquat, Chlorpyrifos, Chlorpyrifos-methyl, Cypermethrin, Fenitrothion, Lindane and Malathion
D	Bromide (total), Amitraz (total), Maneb group, Chlorpyrifos, Procymidone, Cyprodinil, Ethephon, Chlormequat, Benomyl group and Iprodione	Bromide (total), Chlormequat, Pirimiphos-methyl, Piperonyl butoxide, Maneb group (as CS2), Fenpiclonil, Imazalil, Dichlorvos, Malathion/Malaoxon sum, and Teflubenzuron
EL	Maneb group, Aldicarb, Chlorpyrifos, Endosulfan, Procymidone, Benomyl group, Captan, Methamidophos, Phosalone and Iprodione	Dichlorvos, Chlorpyriphos, Deltamethrin, Dichloran, Endosulfan and Malathion
E	Chlorpyriphos, Imazalil, Dicofol, Malathion, Maneb group, Chlorothalonil, Methidathion, Endosulfan, Captan+Folpet and Cypermetrine	Pirimiphos-methyl, Malathion, Lindane, Phosalone, Iprodione, Methamidophos and Propyzamide
F	Maleic Hydrazide, Bromides, Methomyl, Thiabendazol, Benomyl Group, Imazalil, Maneb Group, Iprodione, Chlorpyriphos and Imidacloprid	Pyrimiphos methyl, Malathion, Deltamethrin, Dichlorvos, Chlorpyriphos methyl, Chlorpyriphos and Lindane
IRL	Thiabendazole, Benomyl group, Captan, Iprodione, Chlorpyrifos, Methidathion, Chlorothalonil, Tolyfluanid, Dicofol and Phosmet	Pirimophos-me, Diazinon, Deltamethrin, Iprodione and Malathion
I	Procymidone, Chlorpyrifos, Chlorothalonil, Parathion-methyl, Diazinon, Malathion, Vinclozolin, Chlorpyrifos-methyl, Phosalone and Pirimiphos-methyl	Pirimiphos-methyl, Piperonyl butoxide, Malathion, Maneb, Parathion, Chlorpyrifos-methyl, Dichlorvos, Endosulfan, Iprodione and Carbaryl
L	Maneb group, Folpet, Procymidon, Iprodion, Metalaxyl, Oxadixyl, Pyrimethanil, Malathion, Endosulfan, Parathion-methyl and Pirimicarb	None.
NL	Maneb group, Propamocarb, Iprodione, Chlormequat, Imazalil, Benomyl group, Thiabendazole, Chlorpyriphos-ethyl, Cyprodinil and Imidacloprid	Chlormequat, Pirimiphos-methyl and Malathion

Country	Pesticides found most often. The last row lists the pesticides mentioned most often from all Member States and Norway, Iceland and Liechtenstein	
	Fruit and vegetables	**Cereals**
A	Maneb-Group, Fludioxonil, Procymidone, Cyprodinil, Iprodione, Chlorpyrifos, Azoxystrobin, Endosulfan, Methomyl and Cypermethrin	Pirimiphos-methyl, Chlorpyrifos-methyl, Deltamethrin, Benomylgroup, Chlorpyrifos and Malathion
P	Maneb group, Iprodione, Procymidone, Dichlofluanid, Benomyl (group), Methiocarb, Chlorpyriphos, Endosulfan, Azoxystrobin and Dicofol	Malathion, Pirimiphos-methyl, Dichlorvos, Deltamethrin and Chlorpyriphos-methyl
FIN	Dithianon, Maleic hydrazide, Bromides inorganic, Hydrogen phosphide, Benomyl group, Imazalil, Procymidone, Chlorpyrifos, Tolylfluanid and Thiabendazole	Hydrogen phosphide, Bromides inorganic, Chlormequat, Pirimiphos-methyl, Chlorpyriphos-methyl and Malathion
S	Bromide (inorganic), Maneb group2, Diquat, Chlormequat, Maleic hydrazide, Benomyl group, Imazalil, Thiabendazole, Imidacloprid and Captan	Chlormequat, Mepiquat, Glyphosate, Phosphine, Bromide (inorganic), Pirimiphos-methyl, Chlorpyrifos-methyl, Deltamethrin, Malathion and Cypermethrin
UK	Hydrogen phosphide, Chlormequat, 2,4-D, Chlorpropham, Benomyl group, Maleic hydrazide, Fenhexamid, Inorganic bromide, Maneb group and Triadimefon	Chlormequat, Glyphosate and Pirimiphos-methyl
Norway	Chlormequat, Maneb group, Imazalil, ortho-Phenylphenol, Thiabendazole, Iprodione, Benomyl group, MCPA, Cyprodinil and Tolylfluanid	Glyphosate, Chlormequat, AMPA, Malathion and Chlorpyriphos
Iceland	Thiabendazole, Imazalil, Ortophenylphenol, Chlorpyriphos, Tolyfluanid, Diphenylamine, Iprodione, Methidathion, Procymidone and Dicofol	None
Liechten-stein	Maneb group, Benomyl group, Diazinon, Captan + Folpet, Acephate, Chlorpyriphos and Methamidophos	None
EU, NOR, ICE and LIE	Maneb group, Chlorpyriphos, Benomyl group, Imazalil, Iprodione, Procymidone, Chlormequat, Bromides, Thiabendazol, Maleic-hydrazide and Cyprodinil	Pirimiphosmethyl, Malathion, Chlormequat, Deltamethrin, Chlorpyriphos-methyl, Bromides, Dichlorvos, Chlorpyriphos, Glyphosate, Mepiquat, Piperonyl-butoxide, Iprodione, Lindane and Maneb group

Table 8 shows that the most frequently found pesticides on fruit and vegetables were mainly fungicides. On cereals, the pesticides found were mainly insecticides. In both cases, this confirms the findings of previous years.

In the year 2003, the great majority of the ten most frequently found pesticides was identical to 2002 both for fruit and vegetables and cereals.

Prior to 2000, the absolute number of findings was reported whereas, from 2000 onwards, the relative frequency of pesticides occurrences was reported. The separation into the two

categories fruit and vegetables and cereals was introduced in 2001. These changes limit somewhat the comparability of the data over time.

5. THE EU CO-ORDINATED MONITORING EXERCISE

As an EU co-ordinated monitoring exercise, the Commission recommended in 2003 via Commission Recommendation 2002/663/EC that eight commodities should be tested (cauliflower, sweet peppers, wheat, aubergines, rice, table grapes, cucumber and peas) for 42 pesticides (acephate, aldicarb, azinphos-methyl, azoxystrobin, benomyl group, bromopropylate, captan, chlorothalonil, chlorpyriphos, chlorpyriphos-methyl, cypermethrin, deltamethrin, diazinon, dichlofluanid, dicofol, dimethoate, endosulfan, folpet, imazalil, iprodione, kresoxim-methyl, lambda-cyhalothrin, malathion, maneb-group, mecarbam, methamidophos, metalaxyl, methidathion, methiocarb, methomyl, omethoate, oxydemeton-methyl, parathion, permethrin, phorate, pirimiphos-methyl, procymidone, propyzamide, thiabendazole, tolylfluanid, triazophos and vinclozolin). The 42 pesticides analysed in 2003 included all 41 substances analysed in 2002, with one addition - kresoxim-methyl.

The list of pesticides has been extended substantially compared to previous years and comprises all the 20 pesticides analysed from 1998 to 2000 plus another 22. It also includes all the pesticides analysed in 1996 and 1997, apart from DDT, which was analysed only in 1997.

The benomyl-group comprises three different compounds (benomyl, carbendazim, thiophanate-methyl), which are analysed with the same analytical method and determined as sum of residues expressed as carbendazim. The maneb-group, by legal definition, comprises five different dithiocarbamates, which are also determined as a sum, expressed as CS_2.

All Member States and EEA States participated in the EU co-ordinated programme. Overall, 8,579 samples were analysed (631 samples of cauliflower, 1754 of sweet peppers, 1021 of wheat, 706 of aubergines, 635 of rice, 2163 of grapes, 1150 of cucumber and 519 of spinach).

5.1. Sampling design applied in the 2002 EU co-ordinated monitoring programme

5.1.1. Description of the sampling design

In order to achieve reliable information concerning the concentration of pesticides in fruit, vegetables and cereals on the European market a suitable sampling plan is required. According to Commission Recommendation 2002/663/EC, each participating country has to take the minimum number of samples specified in the Annex (see Table 9).

The sampling design of the co-ordinated programme is based on a statistical method proposed by Codex Alimentarius[16]. Based on a binomial probability distribution, it can be calculated that examination of a total sample number of 459 gives a 99 % confidence of detecting one sample containing pesticides above a specific level, if it is anticipated that 1 % of products of plant origin will contain residues above this specific level. This level could be the reporting level[17] or the MRL.

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16 Codex Alimentarius, Pesticide Residues in Foodstuffs, Rome 1994, ISBN 92-5-20372271-1; Vol. 2, p. 372

17 The reporting level is the routinely achievable limit of quantification (lowest level at which residues will be reported as absolute numbers) for the monitoring laboratories and normally corresponds to the lowest calibrated level.

The minimum numbers of samples to be taken of each commodity were fixed at a different level for each country, according to their population and consumer numbers, since adjusting the sample size to the size of the national markets improves the precision of the sampling design. The required number of samples varied from 12 to 93, resulting in a recommended total of 460 samples for all Member States and 496 samples for all participating countries (i.e. incl. EEA States). This procedure was the same as in the previous exercises. In 2003, the recommended minimum number of samples was taken in most cases and in many cases even more samples were taken than recommended. However, Iceland and Liechtenstein did not take the required sample numbers for most of the commodities. Table 9 shows the recommended minimum number of samples by country compared to the number of samples actually taken.

Table 9: Numbers of samples taken by Country for each commodity

Country	Recommend-ed number of samples (for each commodity)	Number of samples taken by commodity							
		Cauliflower	Peppers	Wheat	Aubergines	Rice	Grapes	Cucumber	Peas
B	12	38	45	28	37	22	63	40	37
DK	12	20	24	34	21	17	116	46	16
D	93	122	896	238	185	131	879	373	122
EL	12	2	21	22	18	12	27	19	15
E	45	45	45	45	49	45	45	54	38
F	66	69	92	131	72	5	93	85	46
IRL	12	18	17	22	14	12	28	15	12
I	65	64	145	127	100	139	269	78	31
L	12	12	13	15	12	4	12*	12	12
NL	17	31	145	21	23	21	266	59	23
A	12	10	10	12	11	11	11	11	12
P	12	33	18	29	19	23	32	42	16
FIN	12	31	79	37	17	44	50	83	27
S	12	21	64	139	20	51	106	85	19
UK	66	72	72	68	72	72	72	72	72
Total EU15	**460**	**588**	**1686**	**968**	**670**	**609**	**2069**	**1074**	**498**
Norway	12	32	58	47	30	20	78	61	17
Iceland	12	7	10	2	2	2	12	11	0
Liechte-nstein	12	4	0	4	4	4	4	4	4
Total EU15 and EEA	**496**	**631**	**1754**	**1021**	**706**	**635**	**2163**	**1150**	**519**

* Luxemburg sampled wine grapes.

5.1.2. Statistical evaluation of the results of the co-ordinated exercise

As described in section 5.1.1. the statistical approach of Codex Alimentarius requires that at least one sample of the whole number of samples must contain a specific concentration of a certain pesticide (e.g. above the reporting level or above the MRL), in order to assess the lowest portion of food items containing pesticides above this specific level in the whole population. In the following section this lowest portion shall be estimated on a 95 % confidence level for each of the 42 pesticides.

The portion of samples with residues below or at the MRL (grey columns), or exceeding the MRL (white columns), of the respective pesticide are shown in Figures 3, 4, 5 and 6 (page 24-26). The results are presented in a logarithmic scale in order to accommodate a broad range of data in the figures. In addition, the corresponding confidence interval on the 95 % level is shown, reflecting the sampling error. The sampling error, in this context, reflects the variability of the data due to the different numbers of samples taken for the determination of the respective pesticide. Other error sources, such as the how and when the samples were taken are not included in this estimation.

The impact of the sampling error on the final result is illustrated using the reported concentrations of the maneb-group in the food items. 4151 samples have been analysed and 418 of them showed residues below or at the MRL. The number of 4151 samples represents only a part of the whole European market, therefore the calculated fraction of samples with residues below or at the MRL (418/4151 = 10 %) is only an estimate for the true but unknown value. The variability of this value can be calculated and is expressed in terms of % samples shown as error bars in the above mentioned figures. For the example of the maneb-group, this means that the true value of the number of samples with residues at or below the MRL would vary between 379 and 460 samples, which corresponds to a range of 9 % to 11%.

The relative sampling error increases with decreasing numbers of samples of a certain category. For cases where no samples with exceeding MRLs have been found, those error bars reflect the actual percentage of the specific commodity in the whole population, which still could contain residues above the MRL. For example, no sample with residues exceeding the MRL for captan was found in the co-ordinated monitoring exercise, but the upper limit of the error range is 0.06 %, which means that 0.06 % of the specific commodities in the whole population (European market) could have exceeding MRLs for captan. This upper limit of the error range for the other pesticides, for which no residues exceeding the MRL have been found (azoxystrobin, captan, deltamethrin, dichlofluanid, folpet, kresoxim-methyl, malathion, mecarbam, omethoate, parathion, phorate, procymidone, propyzamide, tolylfluanid) varied from 0.05 % to 0.09 %. The exact value depended on the number of samples included, but the indicated error range was considered as very low. This ensures sufficient precision of the results and allows for subsequent risk analysis calculations to be carried out.

In figures 3, 4, 5 and 6 the percentage of samples with residues at or below MRL (national or EC-MRL) and exceeding the MRL (national or EC-MRL) for a specific pesticide with the corresponding error bars is shown.

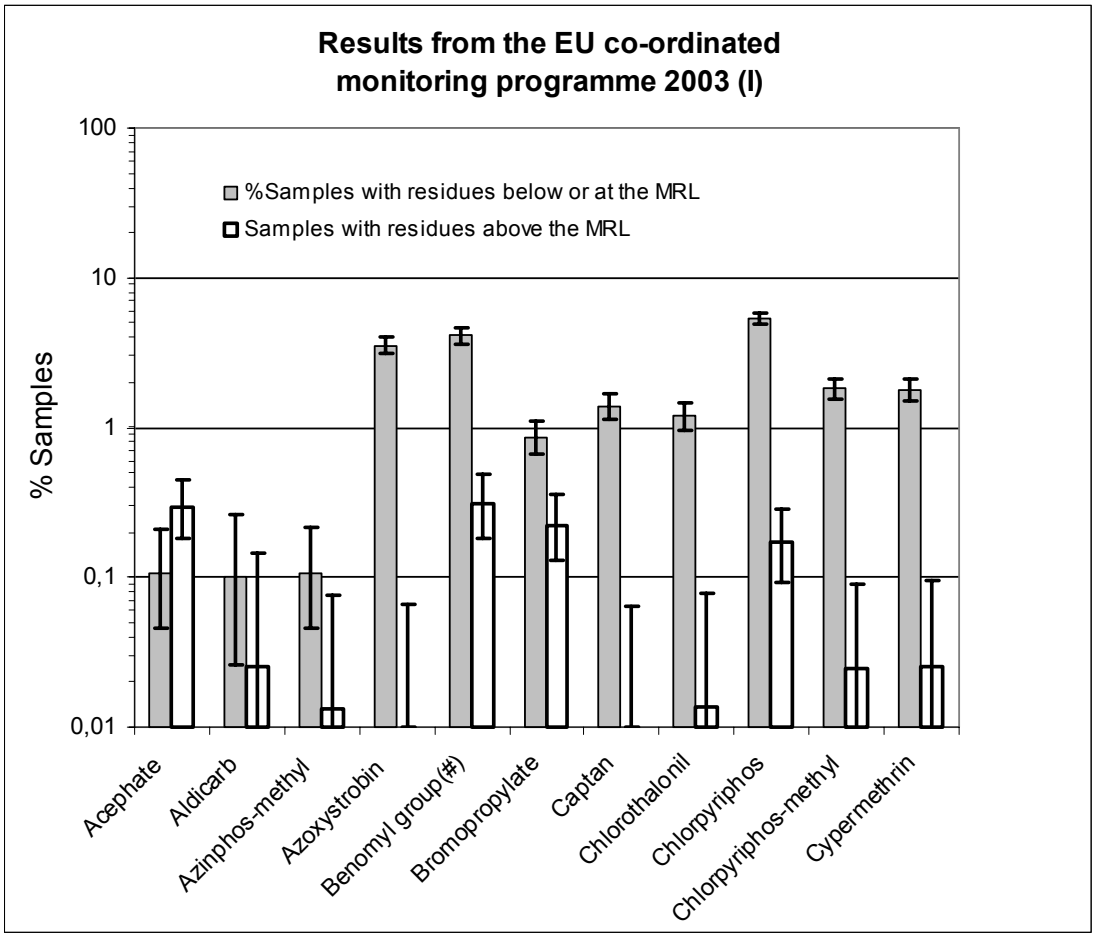


Figure 3: Results of the monitoring programme (I)

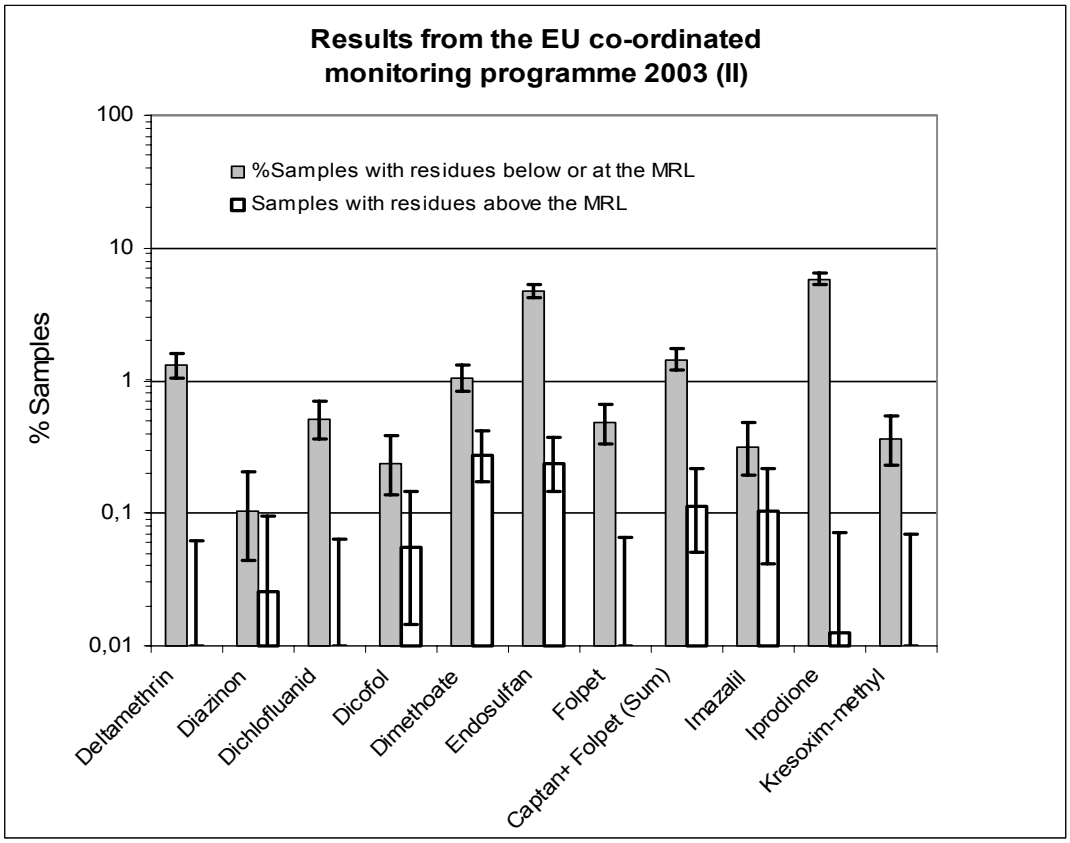


Figure 4:Results of the monitoring programme (II)

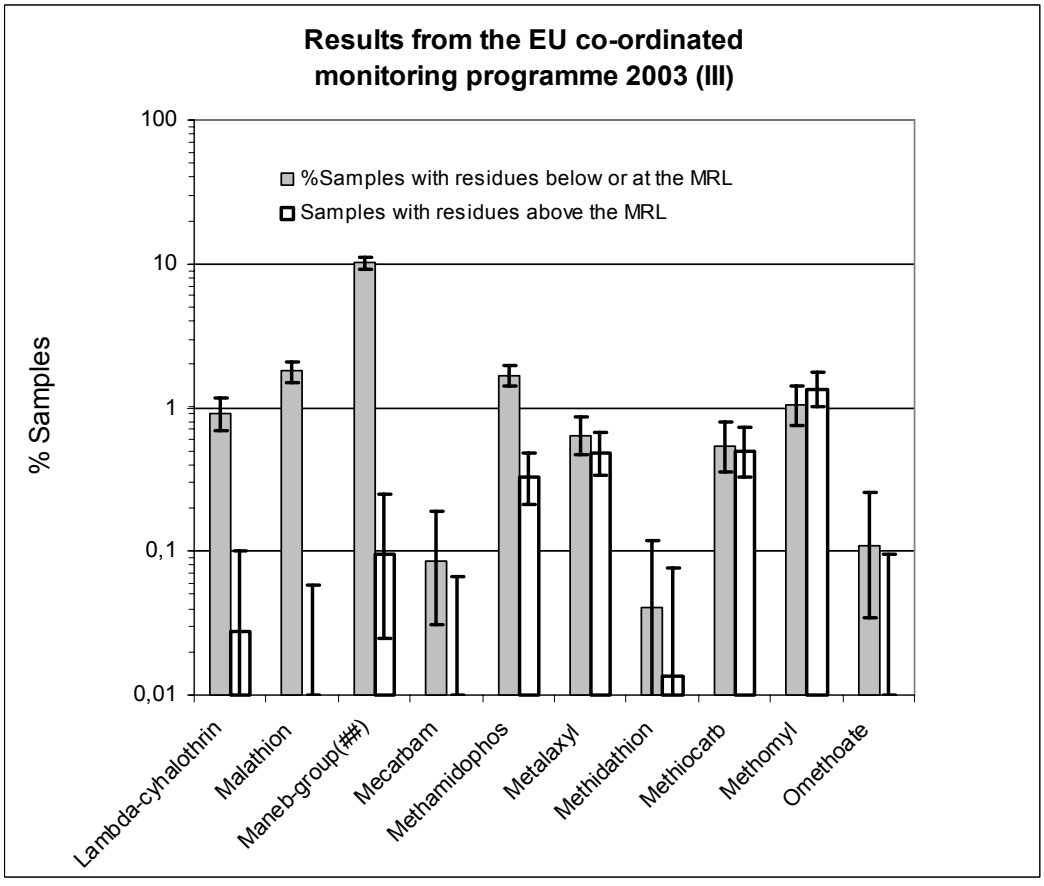


Figure 5:Results of the monitoring programme (III)

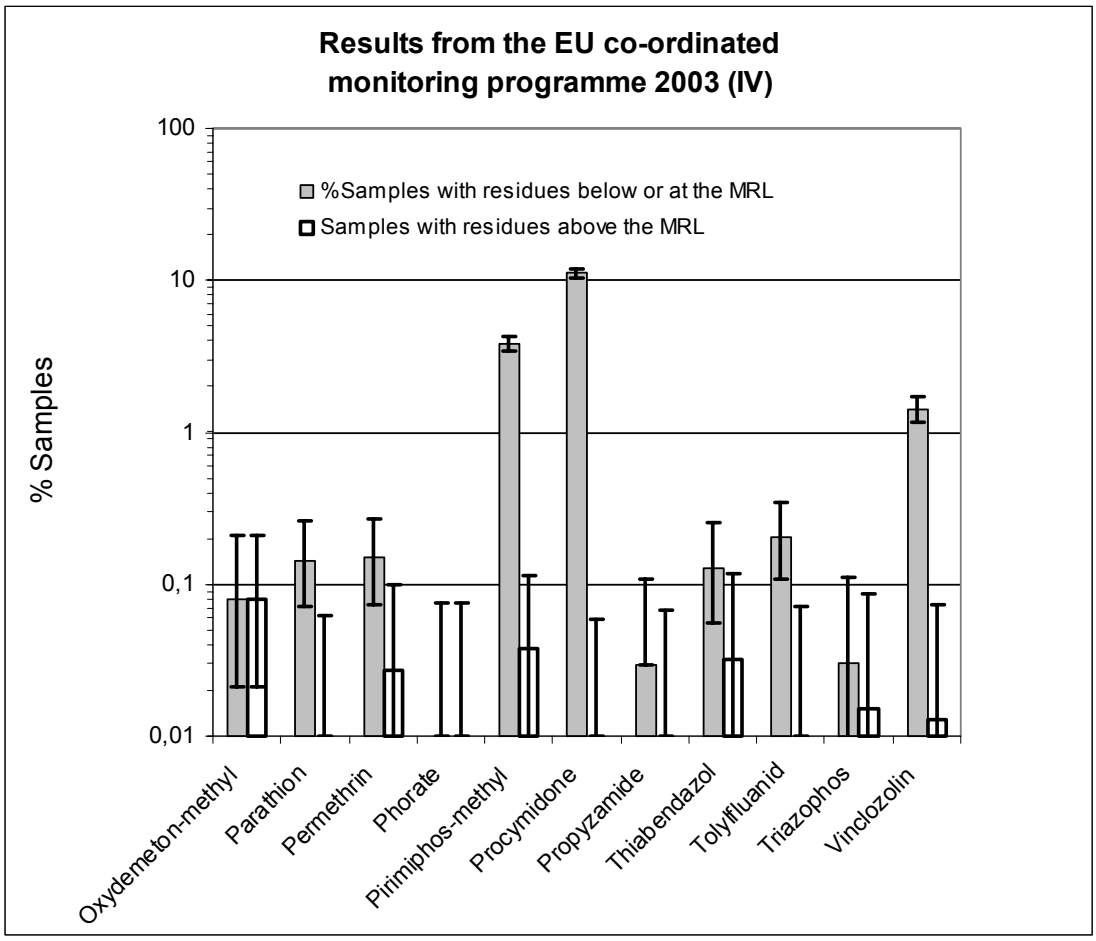


Figure 6:Results of the monitoring programme (IV)

5.2. Evaluation by pesticide

The summarised results for all 41[18] pesticides are given in Table 10. The Table also gives information on the highest residue of a particular pesticide found in a composite sample in this monitoring exercise. Table 11 shows a selection of the most important pesticide-commodity frequency combinations. More details can be found in Annex 2, where the complete results for all reporting countries and all commodities are given.

In the EU co-ordinated monitoring programme, residues of procymidone were found most often* (11 % of all samples analysed for the substance), followed by maneb group (10 %), iprodione (5.9 %), chlorpyriphos (5.5 %), endosulfan (5 %) and benomyl group (4.5 %). Another group of pesticides had percentages varying from 1 % to under 4 %, among them pirimiphos-methyl (3.9 %), azoxystrobin (3.5 %), methomyl (2.4 %), methamidophos (2 %), chlorpyriphos-methyl (1.8 %), cypermethrin (1.8 %) malathion (1.8 %) and captan+folpet (1.6 %).

For the majority of pesticides, 23 out of 41, the frequency of samples with residues corresponded to less than 1 %.

The frequencies of MRL exceedances for single pesticide detections are all below 1%, except for methomyl, where 1.34% of all samples analysed exceeded MRL. The main other

[18] 42 pesticides were analysed but the results for Captan and Folpet were combined (see footnote 17)

exceedances, in decreasing order are methiocarb (0.50 %), metalaxyl (0.48 %), methamidophos (0.33 %), benomyl group (0.31 %), acephate (0.29 %), dimethoate (0.27 %) endosulfan (0.24 %) and bromopropylate (0.22 %). For 12 substances no exceedance has been reported (3 more than in 2002).

Except for the methomyl group, which exceeded MRLs most often in grapes (4.1 % of all samples), followed by metalaxyl in peppers (1.96 % of all samples), methiocarb in peppers (1.22 % of all samples), and captan+folpet in peas (1.15 %), all the other exceedances of pesticides for specific commodities were below 1%.

Figures 7 and 8 illustrate the findings with regard to the 41 different pesticides in terms of exceedances and detections at or below the MRL.

Table 10: Results from the EU co-ordinated monitoring programme for pesticide residues for each pesticide analysed for in cauliflower, peppers, wheat, aubergines, rice, grapes, cucumber and peas.

Pesticide	**Total No. of samples**	**No. of samples without residues**	**No. of samples with residues below or at MRL**	**%**	**No. of samples with residues above MRL**	**%**	**Maximum residue found in mg/kg (commodity in which it was found and the EC-MRL in mg/kg)**
Acephate	7537	7507	8	0.11	22	0.29	0.66 (table grapes; EC-MRL: 0.02)
Aldicarb	3954	3949	4	0.10	1	0.03	0.085 (sweet peppers; EC-MRL: 0.05)
Azinphos-methyl	7453	7444	8	0.11	1	0.01	1.001 (table grapes; EC-MRL: 1.00)
Azoxystrobin	6965	6718	247	3.55	0	0.00	0.90 (table grapes; EC-MRL: 2.00)
Benomyl group	5779	5522	239	4.14	18	0.31	3.30 (table grapes; EC-MRL: 2.00)
Bromopropylate	7649	7566	66	0.86	17	0.22	1.30 (table grapes; EC-MRL: 2.00)
Chlorothalonil	7301	7213	87	1.19	1	0.01	5.80 (peas; EC-MRL: 2.00)
Chlorpyriphos	8141	7691	436	5.36	14	0.17	2.69 (table grapes; EC-MRL: 0.50)
Chlorpyriphos-methyl	8186	8035	149	1.82	2	0.02	0.42 (sweet peppers; EC-MRL: 0.50)
Cypermethrin	7822	7679	141	1.80	2	0.03	0.89 (sweet peppers; EC-MRL: 0.50)
Deltamethrin	7543	7445	98	1.30	0	0.00	1.00 (rice; EC-MRL: 1.00)
Diazinon	7751	7741	8	0.10	2	0.03	0.31 (sweet peppers; EC-MRL: 0.50)
Dichlofluanid	7399	7361	38	0.51	0	0.00	1.50 (table grapes; EC-MRL: 10.00)

Pesticide	Total No. of samples	No. of samples without residues	No. of samples with residues below or at MRL	%	No. of samples with residues above MRL	%	Maximum residue found in mg/kg (commodity in which it was found and the EC-MRL in mg/kg)
Dicofol	7187	7166	17	0.24	4	0.06	1.40 (table grapes; EC-MRL: 2.00)
Dimethoate	8047	7941	84	1.04	22	0.27	0.41 (table grapes; EC-MRL: 0.02)
Endosulfan	7906	7513	374	4.73	19	0.24	1.80 (sweet peppers; EC-MRL: 1.00)
Captan+ Folpet (Sum)	7948	7824	115	1.45	9	0.11	2.84 (table grapes; EC-MRL: 3.00)
Imazalil	6723	6695	21	0.31	7	0.10	0.35 (sweet peppers; EC-MRL: 0.02)
Iprodione	7993	7525	467	5.84	1	0.01	8.20 (table grapes; EC-MRL: 10.00)
Kresoxim-methyl	6618	6594	24	0.36	0	0.00	0.45 (table grapes; EC-MRL: 1.00)
Lambda-cyhalothrin	7302	7234	66	0.90	2	0.03	0.46 (table grapes; EC-MRL: 0.20)
Malathion	8196	8050	146	1.78	0	0.00	3.10 (wheat; EC-MRL: 8.00)
Maneb-group	4151	3729	418	10.07	4	0.10	2.50 (table grapes; EC-MRL: 2.00)
Mecarbam	7019	7013	6	0.09	0	0.00	0.036 (sweet peppers; EC-MRL: 0.05)
Methamidophos	7658	7505	128	1.67	25	0.33	0.68 (sweet peppers; EC-MRL: 0.01)
Metalaxyl	7633	7547	49	0.64	37	0.48	6.90 (sweet peppers; EC-MRL: 0.05)
Methidathion	7444	7440	3	0.04	1	0.01	0.04 (table grapes; EC-MRL: 0.50)
Methiocarb	5175	5121	28	0.54	26	0.50	1.18 (sweet peppers; EC-MRL: not set)
Methomyl	4245	4144	44	1.04	57	1.34	3.80 (table grapes; EC-MRL: 0.05)
Omethoate	4604	4599	5	0.11	0	0.00	0.06 (aubergines; EC-MRL: 0.20)
Oxydemeton-methyl	4963	4955	4	0.08	4	0.08	0.23 (cucumber; EC-MRL: 0.02)
Parathion	7655	7644	11	0.14	0	0.00	0.11 (table grapes; EC-MRL: 0.5- 0.05[19])

[19] Applicable from May 2003

Pesticide	Total No. of samples	No. of samples without residues	No. of samples with residues below or at MRL	%	No. of samples with residues above MRL	%	Maximum residue found in mg/kg (commodity in which it was found and the EC-MRL in mg/kg)
Permethrin	7403	7390	11	0.15	2	0.03	0.40 (sweet peppers; EC-MRL: 0.05)
Phorate	6077	6077	0	0.00	0	0.00	Not found.
Pirimiphos-methyl	7887	7580	304	3.85	3	0.04	2.55 (wheat; EC-MRL: 5.00)
Procymidone	7923	7036	887	11.20	0	0.00	4.90 (table grapes; EC-MRL: 5.00)
Propyzamide	6841	6839	2	0.03	0	0.00	0.018 (wheat; EC-MRL: 0.02)
Thiabendazol	6209	6199	8	0.13	2	0.03	0.79 (cucumber; EC-MRL: 0.05)
Tolylfluanid	6402	6389	13	0.20	0	0.00	0.165 (table grapes; EC-MRL: not set)
Triazophos	6608	6605	2	0.03	1	0.02	0.21 (sweet peppers; EC-MRL: 0.02)
Vinclozolin	7855	7742	112	1.43	1	0.01	1.66 (table grapes; EC-MRL: 5.00)

Results of the 2003 co-ordinated exercise by pesticide:

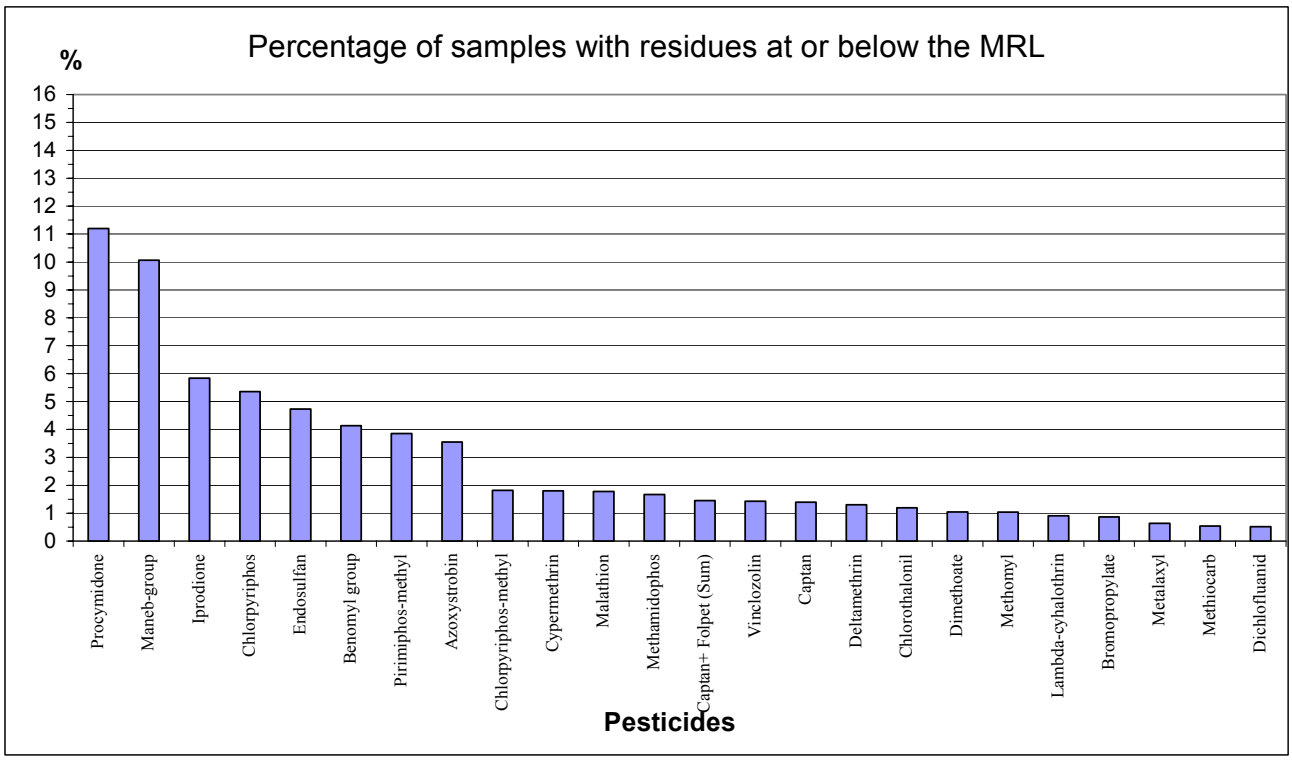


Figure 7: Samples with residues at or below MRL (national or EC-MRL)
(18 pesticides where less than 0.5% of samples had residues at or below the MRL are not included in the chart.)

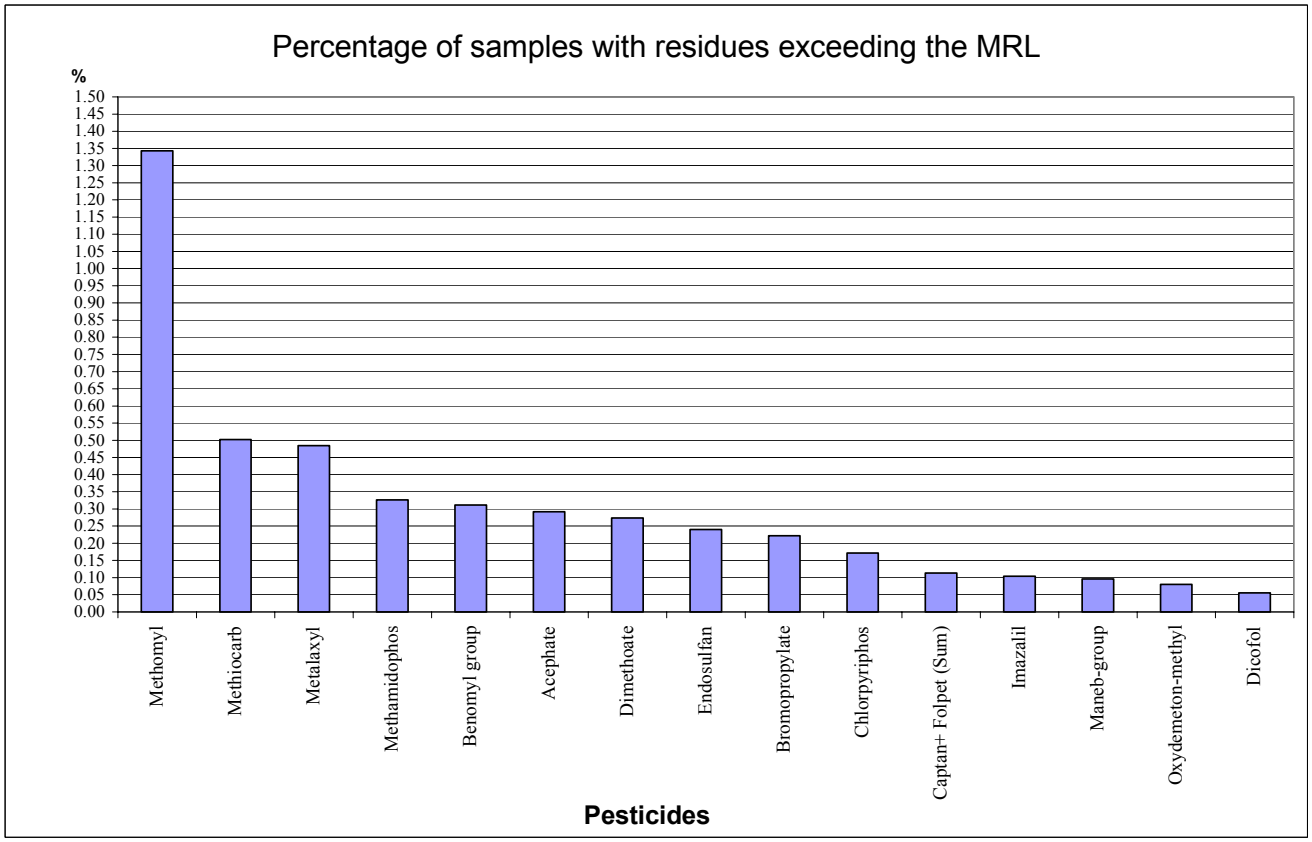


Figure 8: Samples with residues exceeding the MRL (national or EC-MRL)
(27 pesticides where less than 0.05% of samples had residues above the MRL are not included in the chart.)

Table 11: Presentation of the main pesticide-commodity combinations where residues were found (in alphabetical order)

Pesticides	**Detected most often in[20]**	**MRL exceeded most often in**
Acephate	**Table grapes** (1.04% of all table grapes samples ; equal to 0.40% of all 8 products' samples)	**Table grapes** (0.94% of all table grapes samples ; equal to 0.29% of all 8 products' samples)
Aldicarb	**Cauliflower** (0.53% of all cauliflower samples ; equal to 0.13% of all 8 products' samples)	**Sweet peppers** (0.11% of all sweet peppers samples ; equal to 0.03% of all 8 products' samples)
Azinphos-methyl	**Table grapes** (0.39% of all table grapes samples ; equal to 0.12% of all 8 products' samples)	**Table grapes** (0.06% of all table grapes samples ; equal to 0.01% of all 8 products' samples)
Azoxystrobin	**Table grapes** (9.27% of all table grapes samples ; equal to 2.48% of all 8 products' samples) **Sweet peppers** (3.29% of all sweet peppers samples ; equal to 0.69% of all 8 products' samples)	No exceedances.
Benomyl group	**Table grapes** (8.97% of all table grapes samples ; equal to 2.25% of all 8 products' samples) **Sweet peppers** (5.65% of all sweet peppers samples ; equal to 1.14% of all 8 products' samples)	**Sweet peppers** (0.86% of all sweet peppers samples ; equal to 0.17% of all 8 products' samples) **Cucumber** (0.57% of all cucumber samples ; equal to 0.09% of all 8 products' samples)

[20] Percentages in this column include samples at or below the MRL and exceeding the MRL

Pesticides	Detected most often in[20]	MRL exceeded most often in
Benomyl group (contd.)	**Cucumber** (4.12% of all cucumber samples ; equal to 0.62% of all 8 products' samples) **Aubergines** (1.90% of all aubergine samples ; equal to 0.17% of all 8 products' samples)	
Bromopropylate	**Table grapes** (3.55% of all table grapes samples ; equal to 0.95% of all 8 products' samples) **Sweet peppers** (0.55% of all sweet peppers samples ; equal to 0.12% of all 8 products' samples)	**Table grapes** (0.78% of all table grapes samples ; equal to 0.21% of all 8 products' samples)
Chlorothalonil	**Cucumber** (3.29% of all cucumber samples ; equal to 0.48% of all 8 products' samples) **Sweet peppers** (1.94% of all sweet peppers samples ; equal to 0.42% of all 8 products' samples) **Aubergines** (2.07% of all aubergine samples ; equal to 0.19% of all 8 products' samples)	**Peas** (0.24% of all peas samples ; equal to 0.01% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Chlorpyriphos	**Table grapes** (17.33% of all table grapes samples ; equal to 4.31% of all 8 products' samples) **Sweet peppers** (1.94% of all sweet peppers samples ; equal to 0.84% of all 8 products' samples)	**Table grapes** (0.54% of all table grapes samples ; equal to 0.14% of all 8 products' samples)
Chlorpyriphos-methyl	**Table grapes** (5.09% of all table grapes samples ; equal to 1.28% of all 8 products' samples) **Wheat** (3.11% of all wheat samples ; equal to 0.37% of all 8 products' samples)	**Table grapes** (0.10% of all table grapes samples ; equal to 0.02% of all 8 products' samples)
Cypermethrin	**Sweet peppers** (5.33% of all sweet peppers samples ; equal to 1.06% of all 8 products' samples) **Table grapes** (2.44% of all table grapes samples ; equal to 0.60% of all 8 products' samples) **Aubergines** (1.24% of all aubergine samples ; equal to 0.10% of all 8 products' samples)	**Sweet peppers** (0.06% of all sweet peppers samples ; equal to 0.01% of all 8 products' samples) **Wheat** (0.11% of all wheat samples ; equal to 0.01% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Deltamethrin	**Sweet peppers** (2.13% of all sweet peppers samples ; equal to 0.44% of all 8 products' samples) **Wheat** (3.42% of all wheat samples ; equal to 0.42% of all 8 products' samples) **Rice** (2.43% of all rice samples ; equal to 0.19% of all 8 products' samples)	No exceedances.
Diazinon	**Sweet peppers** (0.49% of all sweet peppers samples ; equal to 0.10% of all 8 products' samples)	**Peas** (0.20% of all peas samples ; equal to 0.01% of all 8 products' samples) **Cauliflower** (0.16% of all cauliflower samples ; equal to 0.01% of all 8 products' samples)
Dichlofluanid	**Table grapes** (0.99% of all table grapes samples ; equal to 0.27% of all 8 products' samples) **Sweet peppers** (0.97% of all sweet peppers samples ; equal to 0.20% of all 8 products' samples)	No exceedances.
Dicofol	**Table grapes** (0.87% of all table grapes samples ; equal to 0.24% of all 8 products' samples)	**Sweet peppers** (0.20% of all sweet peppers samples ; equal to 0.04% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Dimethoate	**Cucumber** (2.92% of all cucumber samples ; equal to 0.40% of all 8 products' samples) **Peas** (5.89% of all peas samples ; equal to 0.37% of all 8 products' samples) **Table grapes** (0.96% of all table grapes samples ; equal to 0.25% of all 8 products' samples)	**Table grapes** (0.58% of all table grapes samples ; equal to 0.15% of all 8 products' samples) **Sweet peppers** (0.47% of all sweet peppers samples ; equal to 0.10% of all 8 products' samples)
Endosulfan	**Sweet peppers** (16.50% of all sweet peppers samples ; equal to 3.40% of all 8 products' samples) **Cucumber** (5.99% of all cucumber samples ; equal to 0.82% of all 8 products' samples) **Table grapes** (2.42% of all table grapes samples ; equal to 0.61% of all 8 products' samples) **Aubergines** (1.36% of all aubergine samples ; equal to 0.11% of all 8 products' samples)	**Cucumber** (0.83% of all cucumber samples ; equal to 0.11% of all 8 products' samples) **Aubergines** (0.91% of all aubergine samples ; equal to 0.08% of all 8 products' samples) **Sweet peppers** (0.25% of all sweet peppers samples ; equal to 0.05% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Captan+ Folpet (Sum)	**Table grapes** (5.03% of all table grapes samples ; equal to 1.26% of all 8 products' samples) **Peas** (2.11% of all peas samples ; equal to 0.14% of all 8 products' samples)	**Peas** (1.15% of all peas samples ; equal to 0.08% of all 8 products' samples) **Sweet peppers** (0.12% of all sweet peppers samples ; equal to 0.03% of all 8 products' samples)
Imazalil	**Table grapes** (0.49% of all table grapes samples ; equal to 0.13% of all 8 products' samples) **Wheat** (1.50% of all wheat samples ; equal to 0.10% of all 8 products' samples) **Cucumber** (0.70% of all cucumber samples ; equal to 0.10% of all 8 products' samples)	**Table grapes** (0.22% of all table grapes samples ; equal to 0.06% of all 8 products' samples)
Iprodione	**Table grapes** (16.26% of all table grapes samples ; equal to 4.14% of all 8 products' samples) **Sweet peppers** (5.41% of all sweet peppers samples ; equal to 1.10% of all 8 products' samples) **Cucumber** (2.64% of all cucumber samples ; equal to 0.36% of all 8 products' samples)	**Cucumber** (0.09% of all cucumber samples ; equal to 0.01% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Kresoxim-methyl	**Table grapes** (1.08% of all table grapes samples ; equal to 0.27% of all 8 products' samples)	No exceedances.
Lambda-cyhalothrin	**Table grapes** (2.78% of all table grapes samples ; equal to 0.73% of all 8 products' samples) **Sweet peppers** (0.73% of all sweet peppers samples ; equal to 0.15% of all 8 products' samples)	**Table grapes** (0.10% of all table grapes samples ; equal to 0.03% of all 8 products' samples)
Malathion	**Sweet peppers** (3.92% of all sweet peppers samples ; equal to 0.78% of all 8 products' samples) **Wheat** (6.24% of all wheat samples ; equal to 0.76% of all 8 products' samples) **Rice** (1.45% of all rice samples ; equal to 0.11% of all 8 products' samples)	No exceedances.
Maneb-group	**Table grapes** (14.33% of all table grapes samples ; equal to 3.52% of all 8 products' samples) **Cauliflower** (26.54% of all cauliflower samples ; equal to 2.07% of all 8 products' samples)	**Cauliflower** (0.62% of all cauliflower samples ; equal to 0.05% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Maneb-group (Contd.)	**Cucumber** (9.45% of all cucumber samples ; equal to 1.69% of all 8 products' samples) **Sweet peppers** (8.15% of all sweet peppers samples ; equal to 1.52% of all 8 products' samples) **Aubergines** (7.35% of all aubergine samples ; equal to 0.87% of all 8 products' samples) **Wheat** (2.60% of all wheat samples ; equal to 0.17% of all 8 products' samples)	
Mecarbam	**Table grapes** (0.17% of all table grapes samples ; equal to 0.04% of all 8 products' samples)	No exceedances.
Methamidophos	**Table grapes** (4.44% of all table grapes samples ; equal to 1.18% of all 8 products' samples) **Sweet peppers** (1.78% of all sweet peppers samples ; equal to 0.38% of all 8 products' samples) **Cucumber** (2.52% of all cucumber samples ; equal to 0.35% of all 8 products' samples)	**Sweet peppers** (0.92% of all sweet peppers samples ; equal to 0.20% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Metalaxyl	**Sweet peppers** (2.39% of all sweet peppers samples ; equal to 0.51% of all 8 products' samples) **Table grapes** (1.55% of all table grapes samples ; equal to 0.41% of all 8 products' samples)	**Sweet peppers** (1.96% of all sweet peppers samples ; equal to 0.42% of all 8 products' samples)
Methidathion	**Sweet peppers** (0.18% of all sweet peppers samples ; equal to 0.04% of all 8 products' samples)	**Sweet peppers** (0.06% of all sweet peppers samples ; equal to 0.01% of all 8 products' samples)
Methiocarb	**Sweet peppers** (2.68% of all sweet peppers samples ; equal to 0.64% of all 8 products' samples) **Table grapes** (0.99% of all table grapes samples ; equal to 0.23% of all 8 products' samples) **Aubergines** (1.53% of all aubergine samples ; equal to 0.15% of all 8 products' samples)	**Sweet peppers** (1.22% of all sweet peppers samples ; equal to 0.29% of all 8 products' samples) **Aubergines** (1.99% of all aubergine samples ; equal to 0.15% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Methomyl	**Table grapes** (5.03% of all table grapes samples ; equal to 1.27% of all 8 products' samples) **Sweet peppers** (2.23% of all sweet peppers samples ; equal to 0.49% of all 8 products' samples) **Cucumber** (2.16% of all cucumber samples ; equal to 0.33% of all 8 products' samples)	**Table grapes** (4.10% of all table grapes samples ; equal to 1.04% of all 8 products' samples) **Sweet peppers** (0.96% of all sweet peppers samples ; equal to 0.21% of all 8 products' samples)
Omethoate	**Table grapes** (0.25% of all table grapes samples ; equal to 0.07% of all 8 products' samples)	No exceedances.
Oxydemeton-methyl	**Table grapes** (0.35% of all table grapes samples ; equal to 0.10% of all 8 products' samples)	**Table grapes** (0.21% of all table grapes samples ; equal to 0.06% of all 8 products' samples)
Parathion	**Table grapes** (0.31% of all table grapes samples ; equal to 0.08% of all 8 products' samples)	No exceedances.
Permethrin	**Sweet peppers** (0.58% of all sweet peppers samples ; equal to 0.12% of all 8 products' samples)	**Sweet peppers** (0.06% of all sweet peppers samples ; equal to 0.01% of all 8 products' samples)
Phorate	Not detected.	

Pesticides	Detected most often in[20]	MRL exceeded most often in
Pirimiphos-methyl	**Sweet peppers** (10.47% of all sweet peppers samples ; equal to 2.14% of all 8 products' samples) **Wheat** (11.94% of all wheat samples ; equal to 1.52% of all 8 products' samples)	**Aubergines** (0.30% of all aubergine samples ; equal to 0.03% of all 8 products' samples)
Procymidone	**Table grapes** (22.41% of all table grapes samples ; equal to 5.96% of all 8 products' samples) **Sweet peppers** (17.90% of all sweet peppers samples ; equal to 3.75% of all 8 products' samples) **Cucumber** (5.98% of all cucumber samples ; equal to 0.83% of all 8 products' samples)	No exceedances.
Propyzamide	**Wheat** (0.16% of all wheat samples ; equal to 0.01% of all 8 products' samples)	No exceedances.
Thiabendazol	**Sweet peppers** (0.37% of all sweet peppers samples ; equal to 0.08% of all 8 products' samples)	**Cucumber** (0.19% of all cucumber samples ; equal to 0.03% of all 8 products' samples)

Pesticides	Detected most often in[20]	MRL exceeded most often in
Tolylfluanid	**Cucumber** (0.59% of all cucumber samples ; equal to 0.09% of all 8 products' samples) **Table grapes** (0.33% of all table grapes samples ; equal to 0.08% of all 8 products' samples)	No exceedances.
Triazophos	**Sweet peppers** (0.13% of all sweet peppers samples ; equal to 0.03% of all 8 products' samples)	**Sweet peppers** (0.07% of all sweet peppers samples ; equal to 0.02% of all 8 products' samples)
Vinclozolin	**Peas** (12.13% of all peas samples ; equal to 0.79% of all 8 products' samples) **Table grapes** (1.85% of all table grapes samples ; equal to 0.48% of all 8 products' samples)	**Peas** (0.20% of all peas samples ; equal to 0.01% of all 8 products' samples)

The main pesticide-commodity combination where detectable residues were found most frequently (including those at or below the MRL and exceeding the MRL) was maneb-group/cauliflower where 26.5% of samples had residues. This is followed by procymidone/grapes (22.4%), procymidone/peppers (17.9%), chlorpyriphos/grapes (17.3%), endosulfan/peppers (16.5%), iprodione/grapes (16.3%), maneb-group/grapes (14.3%), vinclozolin/peas (12.1%), pirimiphos-methyl/wheat (11.9%) and pirimiphos-methyl/peppers (10.5%).

The most frequent MRL exceedances were in the pesticide-commodity combinations: methomyl/grapes (4.1%), methiocarb/aubergines (1.99%), metalaxyl/peppers (1.96%), methiocarb/peppers (1.22%), and captan+folpet/peas (1.15%).

Table 12a: Below MRL - Comparative overview of the group of pesticides that were analysed in 1999, 2000 or 2001 for the same commodities examined in 2003 (no comparison possible for aubergines)

% of samples with residues AT OR BELOW THE MRL

	Cauliflower		Peppers		Wheat		Rice		Grapes			Cucumber		Peas	
Composite pesticide list	1999	2003	1999	2003	1999	2003	2000	2003	1996	2001	2003	2000	2003	2000	2003
Acephate	0.48	0.51	1.34	0.00	0.00	0.00	0.00	0.00	0.29	0.07	0.10	0.10	0.00	0.00	0.20
Azinphosmethyl	x	x	x	x	x	x	x	x	x	0.26	0.34	x	x	x	x
Azoxystrobin	x	x	x	x	x	x	x	x	x	7.70	9.27	x	x	x	x
Benomyl group	0.46	1.51	0.77	4.79	0.00	0.19	0.00	0.00	7.54	8.04	8.90	2.76	3.55	2.01	1.14
Captan	x	x	x	x	x	x	x	x	x	6.27	4.33	x	x	x	x
Chlorothalonil	x	x	x	x	x	x	x	x	x	0.25	0.12	x	x	x	x
Chlorpyriphos	0.11	0.00	1.75	3.98	0.00	1.80	0.61	0.55	6.88	10.71	16.79	0.18	0.27	0.00	0.00
Chlorpyriphos-methyl	0.00	0.00	1.91	0.79	7.03	3.11	0.00	0.16	0.39	3.88	4.99	0.18	0.00	0.00	0.19
Deltamethrin	0.00	0.00	0.44	2.13	1.47	3.42	1.67	2.43	x	0.87	0.97	0.10	0.09	0.00	0.00
Diazinon	0.45	0.00	0.00	0.49	0.00	0.00	0.24	0.00	x	0.07	0.00	0.09	0.00	0.00	0.00
Dichlofluanid	x	x	x	x	x	x	x	x	x	1.30	0.99	x	x	x	x
Dicofol	x	x	x	x	x	x	x	x	x	1.34	0.87	x	x	x	x
Dimethoate	x	x	x	x	x	x	x	x	x	4.87	0.38	x	x	x	x
Endosulfan	0.23	0.00	31.24	16.26	0.11	0.00	0.00	0.19	x	1.72	2.42	3.31	5.16	0.16	0.20
Folpet	x	x	x	x	x	x	x	x	x	3.34	1.50	x	x	x	x
Captan+ Folpet (Sum)	x	x	x	x	x	x	x	x	x	8.79	5.03	x	x	x	x
Imazalil	0.00	0.00	0.00	0.07	0.00	1.50	0.00	0.00	x	0.35	0.27	0.32	0.70	0.00	0.00
Iprodione	0.11	0.00	3.02	5.41	0.21	0.00	0.28	0.56	16.42	16.60	16.26	1.77	2.55	1.25	0.59
Lambda-cyhalothrin	0.00	0.00	0.16	0.73	0.37	0.00	0.00	0.00	x	1.85	2.68	0.00	0.19	0.00	0.21
Malathion	x	x	x	x	x	x	x	x	x	0.20	0.29	x	x	x	x
Maneb-group	25.04	25.93	6.54	8.15	0.00	2.60	1.12	1.86	18.17	23.89	14.23	9.62	9.31	5.47	3.13
Mecarbam	0.12	0.00	0.00	0.13	0.00	0.00	0.00	0.00	x	0.07	0.17	0.00	0.09	0.00	0.00
Metalaxyl	0.00	0.00	0.00	0.43	0.00	0.13	0.00	0.00	x	3.88	1.45	1.62	1.04	0.65	0.00
Methamidophos	0.36	0.69	1.94	0.86	0.00	0.00	0.00	0.00	0.08	0.00	4.19	1.94	2.05	0.00	0.00
Methidathion	0.00	0.00	0.14	0.12	0.16	0.00	0.00	0.00	x	0.13	0.06	0.00	0.00	0.00	0.00
Omethoate	x	x	x	x	x	x	x	x	x	3.01	0.25	x	x	x	x
Oxydemethonmethyl	x	x	x	x	x	x	x	x	x	0.00	0.14	x	x	x	x
Permethrin	0.00	0.00	0.45	0.51	0.24	0.00	0.00	0.18	x	0.07	0.13	0.19	0.00	0.00	0.00
Phorate	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Pirimiphos-methyl	0.00	0.00	7.98	10.47	13.00	11.84	5.43	1.60	x	0.07	0.06	0.00	0.00	0.00	0.00
Procymidone	x	x	x	x	x	x	x	x	16.85	17.56	22.41	x	x	x	x
Propyzamide	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Thiabendazol	0.71	0.20	0.00	0.37	0.00	0.00	0.00	0.00	x	0.89	0.06	0.19	0.10	0.00	0.00
Triazophos	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.29	x	0.00	0.00	0.00	0.00	0.00	0.00
Vinclozolin	0.45	0.00	1.06	0.55	0.00	0.00	0.14	0.00	x	2.44	1.85	0.09	0.18	16.56	11.94

x indicates that comparison is not possible

The commodities examined in 2003 had already been evaluated in 1999 (cauliflower, peppers, and wheat), 2000 (rice, cucumber and peas) and 2001 (grapes - also evaluated in 1996). Tables 12a and 12b show a comparative overview for the pesticides that were analysed in those years. For the group of commodities examined in 1999 and 2000, results of 20 pesticides can be compared, while in the case of grapes examined in 2001 the results of a further 14 pesticides can be compared.

The overall comparative picture on residues at or below the MRL is one where there has been little or no change in many pesticide/commodity combinations. Some pesticide/commodity combinations have had a notable increase in the frequency of samples with residues (see details below). There have been a roughly equal (slightly higher) number of cases where the frequency has had a notable decline. In addition, the overall time-comparative picture for MRL exceedances has improved (see below).

Among the most significant cases of increase in frequency are benomyl-group/peppers, chlorpyriphos/peppers, chlorpyriphos/grapes, iprodione/peppers, maneb-group/wheat, methamidophos/grapes, pirimiphos-methyl/peppers and procymidone/grapes.

The most significant cases of decrease in frequency of detections below or at the MRL are for chlorpyriphos-methyl/wheat, dimethoate/grapes, endosulfan/peppers, captan+folpet/grapes, maneb-group/grapes, maneb-group/peas, metalaxyl/grapes, omethoate/grapes, pirimiphos-methyl/rice and vinclozolin/peas.

Notwithstanding these changes over time, the percentage of samples with residues at or below MRL in 2003 is at or over 5% for the following 16 pesticide/commodity combinations (that can be compared over time): azoxystrobin/grapes, benomyl/grapes, chlorpyriphos/grapes, chlorpyriphos-methyl/grapes, endosulfan/peppers, captan+folpet/grapes, iprodione/peppers, iprodione/grapes, maneb-group/cauliflower, maneb-group/peppers, maneb-group/grapes, maneb-group/cucumber, pirimiphos-methyl/peppers, pirimiphos-methyl/wheat, procymidone/grapes and vinclozolin/peas.

Table 12b: Above MRL - Comparative overview of the group of pesticides that were analysed in 1999, 2000 or 2001 for the same commodities examined in 2003 (no comparison possible for aubergines)

% of samples with residues ABOVE the MRL

	Cauliflower		Peppers		Wheat		Rice		Grapes			Cucumber		Peas	
Composite pesticide list	1999	2003	1999	2003	1999	2003	2000	2003	1996	2001	2003	2000	2003	2000	2003
Acephate	0.00	0.00	0.56	0.19	0.00	0.00	0.14	0.00	1.18	0.21	0.94	0.10	0.09	0.00	0.00
Azinphosmethyl	x	x	x	x	x	x	x	x	x	0.00	0.06	x	x	x	x
Azoxystrobin	x	x	x	x	x	x	x	x	x	0.00	0.00		0.00		0.00
Benomyl group	0.61	0.22	0.55	0.86	0.00	0.00	0.00	0.29	2.09	0.38	0.07	0.12	0.57	1.64	0.00
Captan	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Chlorothalonil	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Chlorpyriphos	0.11	0.16	0.00	0.12	0.00	0.00	0.00	0.00	0.23	0.31	0.54	0.00	0.00	0.00	0.00
Chlorpyriphos-methyl	0.00	0.00	0.07	0.00	0.19	0.00	0.00	0.00	0.00	0.13	0.10	0.00	0.00	0.00	0.00
Deltamethrin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	x	0.13	0.00	0.00	0.00	0.00	0.00
Diazinon	0.00	0.16	0.00	0.00	0.10	0.00	0.24	0.00	x	0.13	0.00	0.00	0.00	0.00	0.20
Dichlofluanid	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Dicofol	x	x	x	x	x	x	x	x	x	0.13	0.00	x	x	x	x
Dimethoate	x	x	x	x	x	x	x	x	x	0.00	0.58	x	x	x	x
Endosulfan	0.00	0.00	0.42	0.25	0.00	0.00	0.00	0.00	x	0.00	0.00	0.00	0.83	0.00	0.00
Folpet	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Captan+ Folpet (Sum)	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Imazalil	0.12	0.18	0.07	0.07	0.18	0.00	0.00	0.00		0.07	0.22	0.00	0.00	0.00	0.00
Iprodione	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Lambda-cyhalothrin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	x	0.14	0.10	0.00	0.00	0.00	0.00
Malathion	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Maneb-group	3.88	0.62	0.00	0.00	0.00	0.00	1.68	0.00	0.71	0.38	0.10	1.56	0.13	1.76	0.00
Mecarbam	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	x	0.00	0.00	0.00	0.00	0.00	0.00
Metalaxyl	0.00	0.00	0.14	1.96	0.00	0.13	0.00	0.00	x	0.00	0.10	0.38	0.19	0.00	0.00
Methamidophos	0.00	0.00	18.73	0.92	0.00	0.00	0.00	0.00	0.93	0.21	0.25	0.00	0.47	0.00	0.00
Methidathion	0.00	0.00	0.41	0.06	0.00	0.00	0.00	0.00	x	0.00	0.00	0.00	0.00	0.00	0.00
Omethoate	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Oxydemethonmethyl	x	x	x	x	x	x	x	x	x	0.00	0.21	x	x	x	x
Permethrin	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	x	0.00	0.06	0.00	0.00	0.00	0.00
Phorate	x	x	x	x	x	x	x	x	x	0.00	0.00	x	x	x	x
Pirimiphos-methyl	0.00	0.00	0.14	0.00	0.00	0.10	0.00	0.00	x	0.07	0.00	0.00	0.00	0.00	0.00
Procymidone	x	x	x	x	x	x	x	x	0.22	0.06	0.00	x	x	x	x
Propyzamide	x	x	x	x	x	x	x	x	x	0.07	0.00	x	x	x	x
Thiabendazol	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	x	0.00	0.00	0.00	0.19	0.00	0.00
Triazophos	0.00	0.00	0.15	0.07	0.00	0.00	0.00	0.00	x	0.00	0.00	0.00	0.00	0.00	0.00
Vinclozolin	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	x	0.00	0.00	0.00	0.00	0.46	0.20

x indicates that comparison is not possible

The overall time-comparative picture on residues exceeding the MRL shows that there has been just one notable increase in frequency (metalaxyl on peppers - 1.96% of samples exceeded MRL in 2003), while there have been notable declines for six other pesticide/commodity combinations. The declines are for methamidophos/peppers, maneb-

group/cauliflower, maneb-group/peas, maneb-group/rice, benomyl-group/peas and maneb-group/cucumber. The percentages of exceedances for the time-comparable pesticide/commodity combinations are now all below 1% in 2003 (in most cases well below), except for the aforementioned metalaxyl on peppers.

It should be borne in mind that comparison is difficult due to the fact that MRLs have changed from 1999 to 2003. For example, in the case of metalaxyl on peppers the MRL was reduced in 2000 to the limit of determination and the increase in the frequency of exceedance mentioned above should be seen in this context.

5.3. Evaluation by commodity

Tables 13 and 14 give an overview of the findings in the different commodities. With regard to all eight commodities investigated, about 65 % of the samples were without detectable residues, 32 % of the samples contained residues of pesticides at or below the MRL (national or EC-MRL), and 3.2 % above the MRL (Table 13). Residues at or below the MRL were found most often in grapes (57 %), followed by peppers (34 %), cucumber (24 %) and wheat (22%). MRLs (including national or EC-MRLs) were exceeded most often in peppers (6 %) and grapes (5 %), followed by cucumber (3 %) and aubergines (3 %).

Table 13: Residues found in the eight commodities analysed in the EU co-ordinated monitoring programme

	Number of samples analysed	Without detectable residues	%	With residues below or at MRL (national or EC-MRL)	%	With residues above MRL (national or EC-MRL)	%
Cauliflower	631	520	82	105	17	6	1
Peppers	1754	1051	60	605	34	98	6
Wheat	1021	792	78	226	22	3	0
Aubergines	706	562	80	126	18	18	3
Rice	635	559	88	75	12	1	0
Grapes	2163	821	38	1233	57	109	5
Cucumber	1150	847	74	273	24	30	3
Peas	519	409	79	99	19	11	2
SUM	8579	5561	65	2742	32	276	3.2

In these results, no differentiation is made with regard to findings of several pesticides in the same sample. This means that a sample where two different pesticides were found would be counted as just one finding with detectable residues in Table 13.

To provide a complementary picture, Table 14 shows the residues found in individual determinations, which means the findings with regard to every single pesticide. In this table, a sample where two different pesticides were found would be counted as two findings with detectable residues. In this evaluation, residues of a specific pesticide at or below the MRL (national or EC-MRL) were found most often in grapes (3.2 %), followed by peppers (2.2 %), cucumber (1 %) and wheat (1 %). This is consistent with the results in Table 13.

In the case of pesticide residues exceedances with respect to the number of determinations, the highest frequency was in grapes (0.17 %) and peppers (0.17 %), followed by cucumber (0.07 %) and aubergines (0.07 %). This is also consistent with the results in Table 13.

It can be concluded that grapes and peppers were the commodities on which pesticide residues were most often detected, and for which MRLs (national or EC-MRLs) were most often exceeded.

Table 14: Residues found in individual determinations in the eight commodities analysed in the EU co-ordinated monitoring programme

	Total number of ind. det.	Number of ind. det. without residues	Number of ind. det. with residues below or at MRL (national or EC)	%	Number of ind. det. where a residue exceeded the MRL (national or EC)	%
Cauliflower	23757	23629	121	0.5	7	0.03
Peppers	63397	61866	1422	2.2	109	0.17
Wheat	29743	29457	283	1.0	3	0.01
Aubergines	26094	25915	160	0.6	19	0.07
Rice	18182	18130	51	0.3	1	0.01
Grapes	75230	72700	2405	3.2	125	0.17
Cucumber	43301	42851	418	1.0	32	0.07
Peas	19814	19650	153	0.8	11	0.06
SUM	299518	294198	5013	1.7	307	0.10

Table 15 shows that, on all eight commodities as a whole, pesticides samples in 2003 have had a frequency of detection lower than in 2002 and similar to the average of previous years. However, data are not directly comparable given that commodities and pesticides evaluated were different in the various years (see also chapter 5.2.)

Table 15: Overall results of the 4 - 8 commodities analysed during 1997 - 2003

Commodities analysed in year	Number of samples analysed	Without detectable residues	%	With residues below or at MRL (national or EC-MRL)	%	With residues above MRL (national or EC-MRL)	%
1997	6021	3932	65	2023	34	66	1.1
1998	3836	2524	66	1235	32	77	2.0
1999	4707	3227	69	1043	22	411	8.7
2000	3737	2998	80	638	17	101	2.7
2001	9868	4985	51	4668	47	215	2.2
2002	10046	5305	53	4413	44	328	3.3
2003	8579	5561	65	2742	32	276	3.2

5.4. Evaluation by country

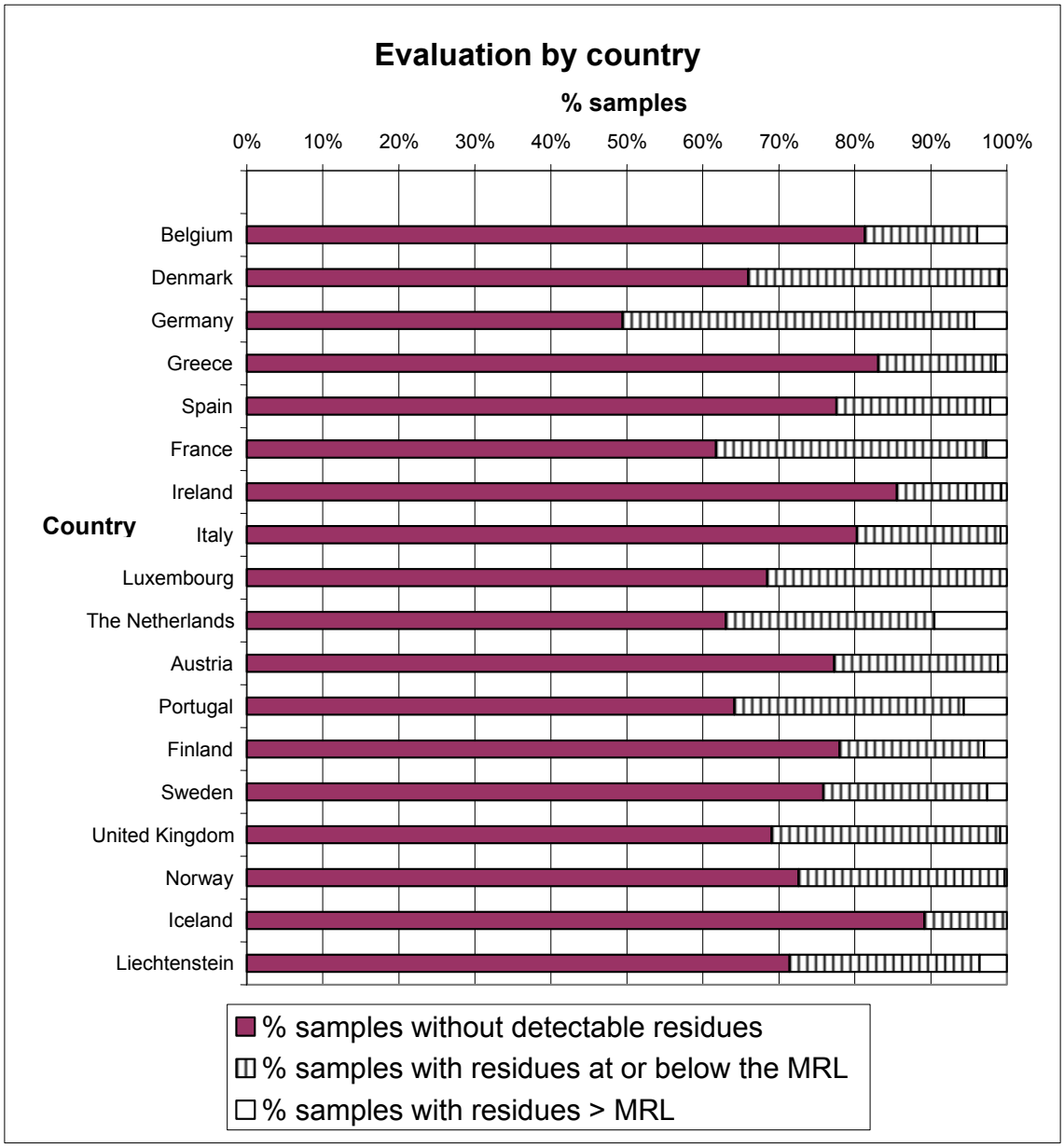
With regard to the 41 pesticides and the eight commodities of the co-ordinated programme, residues at or below the MRL (national or EC-MRL) were found in 32 % of the samples. In 3.2 % of the samples these residues exceeded MRLs (national or EC-MRLs). Differences between countries can result e.g. from different sampling approaches (degree of surveillance sampling and follow-up enforcement sampling), amounts of samples analysed for pesticides that are most likely to be found, legislative framework and reporting levels (cf. chapter 4.1). Table 16 shows the results sorted by country and Figure 9 illustrates those results.

Table 16: Residues of pesticides in the eight commodities as analysed in the EU Co-ordinated programme

	Number of samples analysed	Without detectable residues	%	With residues below or at MRL (national or EC-MRL)	%	With residues above MRL (national or EC-MRL)	%
B	310	252	81	46	15	12	3.9
DK	294	194	66	97	33	3	1.0
D	2946	1456	49	1364	46	126	4.3
EL	136	113	83	21	15	2	1.5
E	366	284	78	74	20	8	2.2
F	593	366	62	211	36	16	2.7
IRL	138	118	86	19	14	1	0.7
I	953	765	80	180	19	8	0.8
L	92	63	68	29	32	0	0.0
NL	589	371	63	162	28	56	9.5
A	88	68	77	19	22	1	1.1
P	212	136	64	64	30	12	5.7
FIN	368	287	78	70	19	11	3.0
S	505	383	76	109	22	13	2.6
UK	572	395	69	172	30	5	0.9
Norway	343	249	73	93	27	1	0.3
Iceland	46	41	89	5	11	0	0.0
Liech-tenstein	28	20	71	7	25	1	3.6
Total	8579	5561	65	2742	32	276	3.2

Evaluation of the results of the 2003 co-ordinated exercise by country:
Percentage of samples without detectable residues, with residues at or below MRL (national or EC-MRL) and with residues exceeding the MRL (national or EC-MRL)

Figure 9: Percentage of samples without residues, with residues at or below the MRL and with residues exceeding the MRL sorted by country



5.5. Homogeneity exercise

In 2003, for the fourth time since 1996, a special exercise was carried out to determine the distribution of pesticide residues in the individual sample units taken from commercial trade, which form part of the analytical sample (composite sample). The residue contents in the individual sample units can differ. This may be partly due to the fact that they do or do not originate from the same producer and therefore may or may not have had the same sample treatment history. But differences can also occur in sample units from the same producer as Tables 17 and 18 show. In order to get an idea of the variability of the single units (and therefore of the homogeneity of the composite monitoring sample) the participating countries were requested to carry out this exercise for a pesticide possibly posing an acute risk.

In 2003, at least one of the following combinations was recommended: for OP-esters, endosulfan and N-methylcarbamates 10 samples of the products grapes, peppers and cucumber should be subjected to individual analysis. It was recommended to take two

samples of an appropriate number of items, analyse the first sample as a composite sample after mixing the items and, if there were detectable residues in the composite sample, to analyse the single items of the second sample. The participating countries were also asked to give information on whether the single units of a sample were taken from a single producer.

The homogeneity of the composite monitoring sample is expressed by calculating a factor, which is called the "homogeneity factor" in order to clearly distinguish this factor from the variability factor (υ) obtained from supervised field trials. The homogeneity factor indicates the variability of the single items' results of a composite monitoring sample, taken in commercial trade. It is calculated by dividing the maximum value by the mean value of the single items' results.

Six out of eighteen countries delivered data for the homogeneity exercise in 2003, for some of the combinations recommended. Ten combinations were evaluated by more than one country; therefore these 10 sets of data were used to calculate mean homogeneity factors. The other data reported for various combinations not comparable are shown in Table 27.

Five countries analysed the combination chlorpyrifos/table grapes. Between one and seven composite samples were taken and, within each sample, 4 - 10 single items were analysed. The Table below shows the results obtained.

Table 17: Results of the homogeneity exercise for chlorpyrifos in table grapes in five countries

Country	Number of composite samples analysed	Number of single units analysed in each composite sample	Homogeneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single producer
EL	2	4	1) 2.10 2) 1.00	1.55	1.00	2.10	0.33	No
FIN	3	10	1) 3.26 2) 2.53 3) 2.08	2.62	2.08	3.26	0.10	Yes No No
NL	2	10	1) 3.70 2) 8.30	6	3.70	8.30	0.65	No
PT	4	10	1) 2.95 2) 1.72 3) 2.07 4) 1.76	2.13	1.72	2.95	0.39	No
UK	7	10	1) 1.82 2) 2.51 3) 3.07 4) 4.63 5) 2.60 6) 2.26 7) 1.80	2.67	1.80	4.63	0.52	Yes
All 5 countries	Range: 2-7 Sum: 18	Range: 4-10	2.79 (Average over 18 values from 5 countries)	--	1.00	8.30	0.65	No

Two countries analysed the combinations acephate/table grape, methomyl/table grape, monocrotophos/table grape, thiodicarb/table grape, methiocarb/table grape, parathion-methyl/table grape, methamidophos/table grape, endosulfan/peppers and endosulfan/cucumbers. Between one and five composite samples were taken and, within each sample, 4- 12 single items were analysed. The results are shown from Tables 18 to 26.

Table 18: Results of the homogeneity exercise for acephate in table grape in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
NL	2	10	1) 10.7 2) 2.30	6.50	2.30	10.7	1.60	No
UK	1	10	4.90*	n.a.	n.a.	n.a.	0.35	Yes
All 2 count-ries	Range: 1-2 Sum: 3	Range: 10	5.97 (Average over 3 values from 2 countries)	--	2.30	10.7	1.60	No

*Homogeneity factor of the one sample analysed. n.a. not applicable since only one composite sample was analysed

Table 19: Results of the homogeneity exercise for methomyl in table grapes in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
NL	3	10	1) 3.40 2) 4.30 3) 5.40	4.37	3.40	5.40	0.32	No
UK	3	10	1) 3.19 2) 2.27 3) 6.87	4.11	2.27	6.87	0.21	Yes
All 2 count-ries	Range: 3 Sum: 6	Range: 10	4.24 (Average over 6 values from 2 countries)	--	2.27	6.87	0.32	No

Table 20: Results of the homogeneity exercise for monocrotophos in table grape in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
NL	1	10	6.50*	n.a.	n.a.	n.a.	0.13	No
UK	1	10	4.20*	n.a.	n.a.	n.a.	0.05	Yes
All 2 count-ries	Range: 1 Sum: 2	Range: 10	5.35 (Average over 2 values from 2 countries)	--	4.20	6.50	0.13	No

*Homogeneity factor of the one sample analysed
n.a. not applicable since only one composite sample was analysed

Table 21: Results of the homogeneity exercise for thiodicarb in table grape in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
NL	1	10	8.40*	n.a.	n.a.	n.a.	0.47	No
UK	1	10	3.78*	n.a.	n.a.	n.a.	0.66	Yes
All 2 count-ries	Range: 1 Sum: 2	Range: 10	6.09 (Average over 2 values from 2 countries)	--	3.78	8.40	0.66	No

*Homogeneity factor of the one sample analysed
n.a. not applicable since only one composite sample was analysed

Table 22: Results of the homogeneity exercise for methiocarb in table grape in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
NL	1	10	2.50*	n.a.	n.a.	n.a.	0.03	No
FIN	1	10	1.26*	n.a.	n.a.	n.a.	0.07	No
All 2 count-ries	Range: 1 Sum: 2	Range: 10	1.88 (Average over 2 values from 2 countries)	--	1.26	2.5	0.07	No

*Homogeneity factor of the one sample analysed
n.a. not applicable since only one composite sample was analysed

Table 23: Results of the homogeneity exercise for parathion-methyl in table grape in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
NL	1	10	4.90*	n.a.	n.a.	n.a.	0.40	No
FIN	1	10	1.48*	n.a.	n.a.	n.a.	0.09	No
All 2 count-ries	Range: 1 Sum: 2	Range: 10	3.19 (Average over 2 values from 2 countries)	--	1.48	4.90	0.09	No

*Homogeneity factor of the one sample analysed
n.a. not applicable since only one composite sample was analysed

Table 24: Results of the homogeneity exercise for methamidophos in table grape in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
NL	2	10	1) 2.10 2) 5.40	3.75	2.10	5.40	0.21	No
UK	1	10	4.50*	n.a.	n.a.	n.a.	0.065	Yes
All 2 count-ries	Range: 1-2 Sum: 2	Range: 10	4 (Average over 3 values from 2 countries)	--	2.10	5.40	0.21	No

*Homogeneity factor of the one sample analysed
n.a. not applicable since only one composite sample was analysed

Table 25: Results of the homogeneity exercise for endosulfan in peppers in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single pro-ducer
EL	1	12	1.71*	n.a.	n.a.	n.a.	0.02	Yes
FIN	5	10	1) 1.70 2) 5.94 3) 2.90 4) 2.53 5) 2.50	3.11	1.70	5.94	0.53	No Yes Yes No Yes
All 2 count-ries	Range: 1-5 Sum: 6	Range: 10-12	2.88 (Average over 6 values from 2 countries)	--	1.70	5.94	0.53	No

*Homogeneity factor of the one sample analysed
n.a. not applicable since only one composite sample was analysed

Table 26: Results of the homogeneity exercise for endosulfan in cucumber in two countries

Country	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homo-geneity factor of each composite sample	Average homogeneity factor	Minimum homogeneity factor	Maximum homogeneity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single producer
EL	4	4-12	1) 1.88 2) 1.71 3) 1.29 4) 1.60	1.62	1.29	1.88	0.21	No Yes Yes Yes
FIN	1	10	2.31*	n.a.	n.a.	n.a.	0.04	Yes
All 2 count-ries	Range: 1-4 Sum: 5	Range: 4-12	1.76 (Average over 5 values from 2 countries)	--	1.29	2.31	0.21	No

*Homogeneity factor of the one sample analysed
n.a. not applicable since only one composite sample was analysed

Table 27: Results of the homogeneity exercise for various commodity/pesticides combinations

Coun-try	Commodity/ pesticide analysed	Number of compo-site samples analysed	Number of single units analysed in each composite sample	Homogen-eity factor of each composite sample	Average homogen-eity factor	Minimum homogen-eity factor	Maxi-mum homogen-eity factor	Max. residue found in a single unit (mg/kg)	Samples taken from single producer
E	Peppers/chlorpyriphos	1	5	2.50*	n.a.	n.a.	n.a.	3	Yes
DK	Grape/prothiophos	2	10	1) 7.00 2) 2.61	4.81	2.61	7.00	0.644	Unknown
FIN	Grape/Chlorpyrifos-methyl	1	10	3.06*	n.a.	n.a.	n.a.	0.11	No
FIN	Grape/endosulfan	1	10	1.86*	n.a.	n.a.	n.a.	0.04	No
FIN	Peppers/imidacloprid	2	10	1) 2.29 2) 2.45	2.37	2.29	2.45	0.39	No
FIN	Peppers/pirimiphos-methyl	1	10	6.85*	n.a.	n.a.	n.a.	0.36	No
NL	Grape/ iprodione	2	10	1) 6.30 2) 5.00	5.65	5.00	6.30	1	No
NL	Grape/ quinoxifen	1	10	2.10*	n.a.	n.a.	n.a.	0.06	No
NL	Grape/vinclozolin	1	10	2.60*	n.a.	n.a.	n.a	0.25	No
NL	Grape/spiroxamine	1	10	3.50*	n.a.	n.a.	n.a.	0.06	No
NL	Grape/carbendazim	2	10	1) 3.3 2) 7.9	5.6	3.3	7.9	0.78	No
NL	Grape/ lambda-cyhalothrin	1	10	4.40*	n.a.	n.a.	n.a.	0.13	No
NL	Grape/ethiofencarb	1	10	1.90*	n.a.	n.a.	n.a.	0.22	No
PT	Grape/fenitrothion	3	10	1) 1.48 2) 1.84 3) 2.15	1.82	1.48	2.15	0.62	No
PT	Grape/malathion	1	10	2.80*	n.a.	n.a.	n.a.	0.33	No
UK	Grape/ phosalone	1	10	5.08*	n.a.	n.a.	n.a.	0.79	Yes
UK	Grape/methomyl+ thiodicarb	1	10	3.14*	n.a.	n.a.	n.a.	0.80	Yes

*Homogeneity factor of the one sample analysed

n.a. not applicable since only one composite sample was analysed

5.6. Exposure assessment

5.6.1. Chronic risk

To estimate the chronic risk to the consumer for the commodities investigated in the EU co-ordinated programme, calculations can be done based on consumption figures from the World Health Organisation (Standard European Diet). A realistic exposure assessment for those pesticides representing a chronic risk should not be carried out with the highest residues found, but more correctly with the average residues or, to consider worst case conditions, on the basis of the 90th percentile[21]. The 90th percentile of the amount of residues found in the monitoring exercise is the value below which 90 % of the values are situated, including those samples with no detectable residues (see calculation example in the footnote)[22]. The risk assessment was carried out for an adult with an average bodyweight of 60 kg. The intake of a specific pesticide via a specific commodity was calculated and compared with the ADI. The results (as a percentage of the ADI) are given in Table 28. No refinement factor for edible portion has been applied.

Table 28: Exposure assessment for chronic risk from the dietary intake of pesticide residues (based on the 90th percentile), calculated for an adult (60 kg bodyweight), in those commodities of the co-ordinated programme in which the highest residues of the respective pesticides were found, and where the 90th percentile was above 0.01 mg/kg

Compound	Food item	90th percentile (mg pesticide / kg commodity)	ADI[23] (mg pesticide / kg body weight/day)	Average consumption (kg commodity / day)[24]	Intake via specific commodity (mg pesticide / day / kg body weight)[25]	Intake in % of the ADI
Acephate	Table grapes	≤ 0.01	0.01	--	--	--
Aldicarb	Sweet Peppers	≤ 0.01	0.003	--	--	--
Azinphos-methyl	Table grapes	≤ 0.01	0.005	--	--	--

21 WHO/FSF/FOS/97.7, p. 14

22 Example: the 90th percentile for the content of residues of the chlorpyriphos in table grapes is to be determined: 2025 samples were analysed in total in the EU and EEA States, out of which 1674 samples contained no detectable residues. 351 samples showed different residue contents, categorised in 9 categories (cat.1: up to 0.01 mg/kg, cat. 2: 0.011-0.020 mg/kg, cat. 3: 0.021-0.050 mg/kg, cat. 4: 0.051-0.1 mg/kg, cat. 5: 0.11-0.2 mg/kg, cat. 6: 0.21-0.5 mg/kg, cat.7: 0.51-1, cat.8: 1.1-2. cat.9: 2.1-5). 90 % of all values would comprise 2025*0.9= 1822.5 samples. Since 1674 samples are without residues and 351 samples have residue contents between the reporting limit and 5 mg/kg, the 1822/1823rd sample falls within the samples of category 3 (0.021-0.05 mg/kg). Because of the categorised reporting format the exact 90th percentile value can not be given, but the 90th percentile can be given as ≤ 0.05 mg/kg as the upper limit of category 3 is 0.05 mg/kg.

23 WHO/IPCS/2002.3 – JMPR Evaluation reports – EU Regulatory Decisions

24 GEMS/FOOD Regional diets WHO/FSF/FOS 98.3 Revision September 2003

25 Calculated only if the 90th percentile is above the general reporting limit of 0.01 mg/kg of the agreed format

Compound	Food item	90th percentile (mg pesticide / kg commodity)	ADI[23] (mg pesticide / kg body weight/day)	Average consumption (kg commodity / day)[24]	Intake via specific commodity (mg pesticide / day / kg body weight)[25]	Intake in % of the ADI
Azoxystrobin	Table rapes	≤ 0.01	0.1	--	--	--
Benomyl group	Table grapes	≤ 0.01	0.03[26]	--	--	--
Bromopropylate	Table grapes	≤ 0.01	0.03	--	--	--
Captan	Table grapes	≤ 0.01	0.1	--	--	--
Chlorothalonil	Peas	≤ 0.01	0.03	--	--	--
Chlorpyriphos	Table grapes	≤ 0.05	0.01	0.0138	0.00001	0.115
Chlorpyriphos-methyl	Sweet Peppers	≤ 0.01	0.01	--	--	--
Cypermethrin	Sweet Peppers	≤ 0.01	0.05	--	--	--
Deltamethrin	Rice	≤ 0.01	0.01	--	--	--
Diazinon	Sweet Peppers	≤ 0.01	0.002	--	--	--
Dichlofluanid	Table grapes	≤ 0.01	0.3	--	--	--
Dicofol	Table grapes	≤ 0.01	0.002	--	--	--
Dimethoate	Table grapes	≤ 0.01	0.002	--	--	--
Endosulfan	Sweet Peppers	≤ 0.05	0.006	0.0103	0.000009	0.143
Folpet	Table grapes	≤ 0.01	0.1	--	--	--
Imazalil	Sweet Peppers	≤ 0.01	0.03	--	--	--
Iprodione	Table grapes	≤ 0.2	0.06	0.0138	0.00005	0.077
Kresoxim-methyl	Table grapes	≤ 0.01	0.4	--	--	--
Lambda-cyhalothrin	Table grapes	≤ 0.01	0.005	--	--	--
Malathion	Wheat	≤ 0.01	0.3	--	--	--

26 ADI of carbendazim, as this pesticide has the lowest ADI of the three pesticides (carbendazim, benomyl, thiophanate-methyl) detected as carbendazim

Compound	Food item	90th percentile (mg pesticide / kg commodity)	ADI[23] (mg pesticide / kg body weight/day)	Average consumption (kg commodity / day)[24]	Intake via specific commodity (mg pesticide / day / kg body weight)[25]	Intake in % of the ADI
Maneb-group	Table grapes	≤ 0.05	0.03/ 0.007[27]	0.0138	0.00001	0.038 0.164
Mecarbam	Sweet Peppers	≤ 0.01	0.002	--	--	--
Metalaxyl	Sweet Peppers	≤ 0.01	0.08	--	--	--
Methamidophos	Sweet Peppers	≤ 0.01	0.004	--	--	--
Methidathion	Table grapes	≤ 0.01	0.001	--	--	--
Methiocarb	Sweet Peppers	≤ 0.01	0.02	--	--	--
Methomyl	Table grapes	≤ 0.01	0.02	--	--	--
Omethoate	Aubergines	≤ 0.01	--	--	--	--
Oxydemeton-methyl	Cucumber	≤ 0.01	0.0003	--	--	--
Parathion	Table grapes	≤ 0.01	0.004	--	--	--
Permethrin	Sweet Peppers	≤ 0.01	0.05	--	--	--
Phorate	NOT FOUND	--	--	--	--	--
Pirimiphos-methyl	Wheat	≤ 0.02	0.03	0.1780	0.00006	0.198
Procymidone	Table grapes	≤ 0.5	0.1	0.0138	0.000115	0.115
Propyzamide	Wheat	≤ 0.01	0.085	--	--	--
Thiabendazole	Cucumber	≤ 0.01	0.1	--	--	--
Tolylfluanid	Table Grapes	≤ 0.01	0.08	--	--	--
Triazophos	Sweet Peppers	≤ 0.01	0.001	--	--	--
Vinclozolin	Table grapes	≤ 0.01	0.01	--	--	--

27 roup ADI for maneb, mancozeb, metiram, zineb 0.03 propineb 0.007

As shown by the results in Table 28, the intake of pesticide residues remains clearly below the ADI in any case. The exposure ranges from 0.038 % of the ADI for maneb on table grapes, to 0.198 % of the ADI for pirimiphos-methyl on wheat.

5.6.2. Acute risk

Currently, there is no universally accepted methodology for evaluating risks from acute exposure. However, as an example, the acute risk can be evaluated by using the UK Consumer Exposure Model, where an exposure assessment is carried out based on the 97.5th percentile of consumption[28]. That means, in order to include consumers with a high consumption of specific commodities, a large portion value is used. The 97.5th percentile is the value below which the consumption of 97.5 % of all consumers is situated.

For the 2003 co-ordinated programme, the evaluation of the acute risk was carried out for those pesticides which have acute toxicity and where acute Reference Doses (acute RfDs) have been set. The highest residue found in a composite sample was used in this calculation. Furthermore, in order to consider worst case conditions a default variability factor of seven[29], taking into account unit-to-unit variability of single units, was used for the medium sized crops with a unit weight ≤ 250 g (e.g. peppers). For wheat and rice, with a unit weight < 25 g a variability factor of 1 has been used. In case of grape the evaluation has been done with a variability factor of 5 for variability among bunches[30].

On the basis of these data, an exposure assessment for an adult (16-64+years) of 70.1 kg and a toddler (1.5-4.5 years) of 14.5 kg have been carried out and the intake of the specific pesticide via a specific commodity was compared with the acute Reference Dose (acute RfD)[31]. The results are shown in Table 29.

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28 UK 1998, Technical Policy on the Estimation of Acute Dietary Intakes of Pesticide Residues, AAHL/3/1998, 13 January 1998, PSD, York

29 Opinion of the Scientific Panel on Plant Health, Plant protection products and their residues on a request from Commission related to the appropriate variability factors to be used for acute dietary exposure assessment of pesticide residues in fruit and vegetables (EFSA O.J.(2005) 177, 1-61)

30 Document SANCO/3346/2001/ "Proposal on notification criteria for pesticide residue findings to the RASFF"

31 Consumer Exposure Model, UK

Table 29: Exposure assessment for acute risk from the pesticides investigated in the 2003 co-ordinated programme for the products with the highest residues found in a composite sample in the European Union. The calculation was performed with the UK Consumer Exposure Model for an adult (70.1-kg) and a toddler (14.5-kg) and only those pesticides, which have acute toxicity, and where an acute Reference Dose has been set.

Compound	Food item	Maximum residue found in a composite sample (mg pesticide / kg commodity	acute Reference Dose (mg pesticide / kg body weight)[32]	97.5th percentile of consumption (kg commodity / day)[33]	Homog-eneity factor	Intake via specific commodity (mg pesticide / day / kg body weight)	Intake in % of the acute Reference Dose
Acephate	Table grapes	0.66 *EC-MRL: 0.02*	0.05	0.190 (adult)/ 0.158 (toddler)	5	0.0089 (adult)	18% (adult)
						0.0360 (toddler)	72% (toddler)
Aldicarb	Sweet Peppers	0.085 *EC-MRL: 0.05*	0.003	0.089 (adult)/ 0.050 (toddler)	7	0.0008 (adult)	25% (adult)
						0.0021 (toddler)	68% (toddler)
Chlorpyri-phos	Table grapes	2.69 *EC-MRL: 0.5*	0.1	0.190 (adult)/ 0.158 (toddler)	5	0.0365 (adult)	36% (adult)
						0.1466 (toddler)	**147%** (toddler)
Deltamethrin	Rice	1 *EC-MRL : 1*	0.01	0.103 (adult)/ 0.056 (toddler)	1	0.0015 (adult)	15% (adult)
						0.0039 (toddler)	39% (toddler)
Diazinon	Sweet Peppers	0.31 *EC-MRL: 0.5*	0.03	0.089 (adult)/ 0.050 (toddler)	7	0.0028 (adult)	9% (adult)
						0.0075 (toddler)	25% (toddler)
Dimethoate	Table grapes	0.41	0.02	0.190 (adult)/ 0.158 (toddler)	5	0.0056 (adult)	28% (adult)

[32] WHO/IPCS/2002.3- JMPR Evaluation Reports 2003 - EU Regulatory Decisions

[33] Consumer Exposure Model, UK

Compound	Food item	Maximum residue found in a composite sample (mg pesticide / kg commodity	acute Reference Dose (mg pesticide / kg body weight)[32]	97.5th percentile of consumption (kg commodity / day)[33]	Homog-eneity factor	Intake via specific commodity (mg pesticide / day / kg body weight)	Intake in % of the acute Reference Dose
		EC-MRL: 0.02				0.0223 (toddler)	**112%** (toddler)
Endosulfan	Sweet Peppers	1.8 *EC-MRL: 1*	0.02	0.089 (adult)/ 0.050 (toddler)	7	0.0160 (adult)	80% (adult)
						0.0434 (toddler)	**217%** (toddler)
Lambda-cyhalothrin	Table grapes	0.46 EC-MRL: 0.2	0.0075	0.190 (adult)/ 0.158 (toddler)	5	0.0062 (adult)	83% (adult)
						0.0251 (toddler)	**334%** (toddler)
Malathion	Wheat	3.10 *EC-MRL : 8*	2	0.301 (adult)/ 0.128 (toddler)	1	0.0133 (adult)	1% (adult)
						0.0274 (toddler)	1% (toddler)
Methamido-phos	Sweet Peppers	0.68 *EC-MRL: 0.01*	0.01	0.089 (adult)/ 0.050 (toddler)	7	0.0060 (adult)	60% (adult)
						0.0164 (toddler)	**164%** (toddler)
Methidathion	Table grapes	0.04 *EC-MRL: 0.5*	0.01	0.190 (adult)/ 0.158 (toddler)	5	0.0005 (adult)	5% (adult)
						0.0022 (toddler)	22% (toddler)
Methiocarb	Sweet Peppers	1.18 EC-MRL: Not set	0.02	0.089 (adult)/ 0.050 (toddler)	7	0.0105 (adult)	52% (adult)
						0.0285 (toddler)	**142%** (toddler)
Methomyl	Table grapes	3.80 EC-MRL: 0.05	0.02	0.190 (adult)/ 0.158 (toddler)	5	0.0515 (adult)	**257%** (adult)
						0.2070 (toddler)	**1035%** (toddler)
Oxydemeton-methyl	Cucumber	0.23 EC-MRL:	0.002	0.084 (adult)/ 0.072(toddler)	7	0.0019 (adult)	96% (adult)

Compound	Food item	Maximum residue found in a composite sample (mg pesticide / kg commodity	acute Reference Dose (mg pesticide / kg body weight)[32]	97.5th percentile of consumption (kg commodity / day)[33]	Homog-eneity factor	Intake via specific commodity (mg pesticide / day / kg body weight)	Intake in % of the acute Reference Dose
		0.02				0.0080 (toddler)	**400%** (toddler)
Parathion	Table grapes	0.11 EC-MRL: 0.05	0.01	0.190 (adult)/ 0.158 (toddler)	5	0.0015 (adult)	15% (adult)
						0.0060 (toddler)	60% (toddler)
Thiabendazole	Cucumber	0.79 EC-MRL: 0.05	0.1	0.084 (adult)/ 0.072(toddler)	7	0.0066 (adult)	7% (adult)
						0.0275 (toddler)	27% (toddler)
Tolylfluanid	Table grapes	0.165 EC-MRL: Not set	0.5	0.190 (adult)/ 0.158 (toddler)	5	0.0022 (adult)	0% (adult)
						0.0090 (toddler)	2% (toddler)
Triazophos	Sweet Peppers	0.21 *EC-MRL: 0.02*	0.001	0.089 (adult)/ 0.050 (toddler)	7	0.0019 (adult)	**187%** (adult)
						0.0051 (toddler)	**507%** (toddler)

As Table 29 shows, in nine cases the estimated intakes for the highest residues in a composite sample have been assessed above the acute RfD, mainly in cases regarding the evaluation of toddlers' exposure and with a very high level of residues.

The range in case of adults' exposure goes from 0% to 257% of the acute RfD, while in case of toddlers it ranges from 1 to 1035% of the acute RfD. It must be borne in mind that the above results emerge from an assessment of the worst-case scenarios, based on the maximum level of residues detected, combined with high food consumption data and the highest variability factors. However, further investigation would be required to evaluate the health risk especially for vulnerable groups.

Only one of the above cases where the MRLs were significantly exceeded has been notified via the Rapid Alert System in 2003.

6. SAMPLING

Commission Directive 2002/63/EC established sampling methods for the official control of pesticide residues in and on products of plant and animal origin. Member States are supposed to follow these methods for their pesticide residue monitoring. Furthermore, Table 30 shows the information given in the summaries of the national monitoring reports of the Member States and EEA States on sampling. In most cases, sampling followed annual national plans

that were usually established taking into consideration consumption, production, share of imported and exported products as well as risks (e.g. results from previous years).

Table 31 shows the distribution of domestic/imported samples and the relationship of the number of samples taken to population size.

The share of domestic and imported samples should reflect the situation in the respective national market. In total, about 55 % of the samples were domestic samples and approximately 45% were imported samples, including those from other EU Member States. For the 45% imported samples, 24% are confirmed as originating from other Member States and 20% from third countries. For 0.23 % of samples the origin was unknown.

More detailed information can be found in the summaries of the national monitoring reports in Annex 1.

Samples were taken at different points, such as wholesalers and retailers, local and central markets, points of entry (for imported products), and processing industries.

Table 30: Summary on sampling by the national authorities (information taken from the two-page summaries which are included in Annex I)

Country	Summary on sampling
B	Sampling was carried out by trained officers mostly according to Commission Directive 2002/63/EC, at auctions, importers, wholesalers, processors and exceptionally in retail. In selecting the commodities, the methods of analyses and the number of samples several factors were taken into account: the average consumption, national production figures, results of previous years, RASFF notifications, analytical and budgetary possibilities and other useful information. In case of minor commodities a rolling programme is preferred. The EU coordinated programme was included in the national programme.
DK	The sampling plans were based on the dietary consumption pattern, production and import data and monitoring results from previous years. The samples were taken mainly at wholesalers and importers, 2% at food processing companies, 0.2% at shops and 0.7 % at primary producers. Sampling was carried out according to Commission Directive 2002/63/EC by authorised officers.
D	Samples were taken at the level of producers, manufacturers, wholesalers, retailers and restaurants, according to a national sampling protocol published as official legal regulations by trained officers. The substances tested are the ones already included in the Annexes to Directive 76/895/EEC, 86/362/EEC or 90/642/EEC.
EL	The annual national monitoring plan takes into account the most important factors such as: productions and trade data, dietary intakes contribution of each commodity, sampling location and analytical capacity of laboratories. Samples were taken from points of entry, wholesalers, retailers and farm gates. Sampling was carried out according to Directive 79/700/EEC.
E	Samples were taken mainly from domestic crops 95 % at production and wholesalers level, occasionally at retail level, following Directive 2002/63/EC. The programme took into account proportion of the crops production, requirements of the EU co-ordinated programme and specific actions with regard to certain crops.
F	The general sampling programme is drawn up by the central authority and takes account of national and European priorities, the dietary proportion of plant products, the EU co-ordinated programme, previous results and specific targeted inspection on certain fruits and vegetables (lettuces and tropical roots). Samples are taken by trained inspectors at market level: at storage or processing stage in case of cereals grains; for cereals products, fruit and vegetables at retail and wholesale level and less frequently to producers. For all imported products specific action was deployed at points of arrival.
IRL	The programme was designed by taking account of: the current consumption patterns of Irish adults, results of previous plans, coordinated EU monitoring requirements for 2003, manner in which food is handled prior to consumption, analytical capability. Samples are taken in accordance with EU sampling Directive 2002/63/EC by specifically appointed officers. Samples are normally taken at wholesale level and occasionally at retail level.
I	A national annual sampling plan is set on the basis of productions and consumption data at regional level. The plan foresees also priority of research of residues from certain plant protection products both in animal and vegetables. It is implemented by the Regions, with regard to products of plant origin imported, the sampling is

Country	Summary on sampling
	performed by Uffici of Sanita' Marittima of Ministry of Health in at least 3% of a lot present at importation with a priority given to fruit and vegetables. Samples are taken at cooperatives, specialised and non specialised wholesale markets, wholesale stores, hypermarkets and supermarkets. The sampling is carried out according to Directive 2002/63/EC.
L	Due to limited resources, the annual programme consisted mainly of the EU co-ordinated programme and of few more commodities herbal tea and strawberries. Samples were collected by a food inspector. Imported products were sampled at wholesale distribution points and retailers, local products were sampled at the central market in the City of Luxembourg and directly at local growers. As far as practicable sampling was carried out according to Directive 2002/63/EC.
NL	The samples are taken without prior information about the presence of pesticides and, therefore, represent the situation on the market for the product at that time. But sampling is directed relatively more to products where previous results indicated MRL violations. Directive 2002/63/EC (as transposed into national law) was respected. The monitoring program is primarily directed to major products in the consumption pattern, but some capacity is reserved for minor products. In the monitoring program special attention was given to chlormequat on pears, because of the high level of exceedances in 1999. The main sampling points are the premises of the auction system for Dutch products and importers, warehouses and distribution centres of retail chains for both domestic and non domestic products.
A	Sampling was based on a nation-wide sampling plan, taking into account data concerning dietary consumption, production and import of fruit and vegetables, results of former measurements as well as analytical and budgetary capacities. In addition, higher risk commodities were evaluated as targeted monitoring, including special samples related to RASFF notifications. The samples were taken by trained officials.
P	The national programme for 2003 was based on the EU co-ordinated programme, which was extended to other pesticides according to the capabilities of laboratories. Strawberries, lettuce and spinach were summed up to the programme due to results of previous years. Sampling was carried out by trained officers according to requirements of Directive 2002/63/EC. In the mainland samples were taken mostly at wholesale level. Domestic cereals were generally taken in processing plants. In Madeira samples were taken manly at retail level.
FIN	The national and EC co-ordinated pesticide residues monitoring was carried out according to an annual program. Priorities were decided on the basis of consumption figures and known residues problems. Domestic samples were collected from farms or retail shops. The majority of imported food samples were taken by Customs inspectors, from wholesalers. The sampling procedure of Directive 2002/63/EC was followed as far as practicable.
S	The target number of samples to be collected of each food is risk related and partly linked to food's consumption rate and takes into account both the amount of domestic production and the amount of imports from EU countries and third countries. However, the number is also based on the importance of the foodstuff in the diets of infants and young children as well as residues found in prior samples. Samples were taken in accordance with Directive 2002/63/EC. Samples of cereal grains were collected by stream sampling technique. Fresh fruit and vegetables were sampled at wholesale warehouses, the imported cereal grains at the port and domestic cereals at milling

Country	Summary on sampling
	plants. Most of processed and frozen foods were collected in retail shop or department stores.
UK	Samples have been generally obtained at retail level in population centres selected which are changed every year. Some samples have also been collected at non retail level. The choice of foodstuffs to be analysed in the programmes generally represents a balance between the levels of consumption of those foodstuffs, information on possible residues and need to ensure a wide range of commodities as possible is included. When practicable samples are taken prepared and analysed according to Directive 2002/63/EC. In determining the surveillance programme, intelligence data from other sources is considered e.g. results published of monitoring carried out by other governments, intelligence from industry.
Norway	Samples were taken mainly from wholesaler's warehouses but also from at retail outlets, farm or market places. The number of surveillance samples of each commodity does not reflect their share of the market, as more samples were taken of commodities suspected to contain residues. Trained officers carried out sampling.
Iceland	Sampling plan is made based on information on import volumes and domestic production. Experience is also taken into account as which residues are most often detected in a particular product. Samples are taken at wholesaler's warehouses.
Liechtenstein	The sampling plan is based on domestic production and the ESA[34] co-ordinated programme. The programme started in spring 2003. Samples of fresh fruits, vegetables and cereals were collected mostly from retailers, but also from food processing plants and 8 samples from farms. Samples were taken by trained officers, mostly in accordance with Directive 2002/63/EC.

[34] EFTA Surveillance Authority

Table 31: Number and origin of the samples taken by country (**sum of surveillance and follow-up enforcement samples)**, sum of fresh (incl. frozen) fruit, vegetables, cereals and processed products.

Country	Total number of samples taken	Samples taken per 100,000 inhabi-tants	No. of domes-tic samp-les taken	%	No. of samples from Other Member States (OMS)	%	No. of samples from Third Countries (TC)	%	Origin not known	%
B	1291	13	813	63	244	19	124	10	110	9
DK	1605	30	443	28	576	36	586	37		
D	10758	13	4320	40	4580	43	1858	17		
EL	2086	20	1618	78	13	1	455	22		
E	3670	9	3670	10	0	0	0	0		
F	3375	6	2319	69	597	18	459	14		
IRL	1022	26	299	29	398	39	325	32		
I	7852	14	7083	90	286	4	483	6		
L	107	24	38	36	66	62	3	3		
NL	3268	20	1253	38	910	28	1105	34		
A	1491	19	710	48	498	33	283	19		
P	412	4	268	65	125	30	19	5		
FIN	2158	42	420	19	577	27	1161	54		
S	2447	27	730	30	851	35	866	35		
UK	3220	5	1170	36	907	28	1143	35		
Norway	2335	52	793	34	851	36	691	30		
Iceland	315	110	76	24	135	43	104	33		
Liech-tenstein	48	143	37	77	7	15	4	8		
Total	**47460**	**12**	813	**55**	**11621**	**24**	**9669**	**20**	**110**	**0.23**

7. QUALITY ASSURANCE

Council Directive 90/642/EEC, as amended by Council Directive 97/41/EC, requires Member States to control maximum residue levels according to Council Directives 89/397/EEC and 93/99/EEC. This also means that laboratories have to comply with the European Standard EN 45001, which has been replaced by ISO 17025, and that Member States are requested to assess the laboratories by applying the criteria as laid down in European Standard EN 45002. Member States shall also apply proficiency testing schemes where appropriate.

Commission Recommendation 2002/663/EC lays down that Member States, should provide information about the details of accreditation of the laboratories which carry out the analyses for the monitoring exercise, about the application of the EU Quality Control Procedures and about their participation in proficiency and ring tests. It also requires the countries contributing to the monitoring to provide the accreditation certificates. Workshops on Analytical Quality Control (WAQC) are regularly held in order to review the Quality Control Procedures. Proficiency tests, supported by the European Commission, are also regularly organised (so far, 6 proficiency tests have been organised, the last was carried out in 2004).

The European Commission's Monitoring Regulation No. 645/2000 (cf. chapter 2) ensures the financial contribution of the European Commission to the organisation of proficiency tests and Analytical Quality Control workshops. It also confirms and further specifies the requirements for accreditation of monitoring laboratories and their participation in proficiency tests.

Table 32 and Figures 11 - 13 give an overview of the situation regarding accreditation of monitoring laboratories and participation in proficiency tests. Table 24 is a summary of the information provided by all participating countries.

The overall situation of the laboratories has improved from 2002 as shown in Fig.11. Only 1 country out of 18 has no accredited laboratory, while 12 out of 18 have accredited all their laboratories (67%).

In the EU and EEA States a total of 47,460 samples (sum of fresh and processed products) were analysed and, of these, 75.5% were analysed by laboratories accredited for the most important pesticide-commodity combinations and 24.5 % were analysed by non-accredited laboratories. This is illustrated in Figure 12.

The breakdown of the samples analysed by accredited/not accredited laboratories by country is shown in Figure 13.

Status of laboratory accreditation: Percentage of countries with accreditation of all, of some or of none of the monitoring laboratories in 2003 compared to previous years:

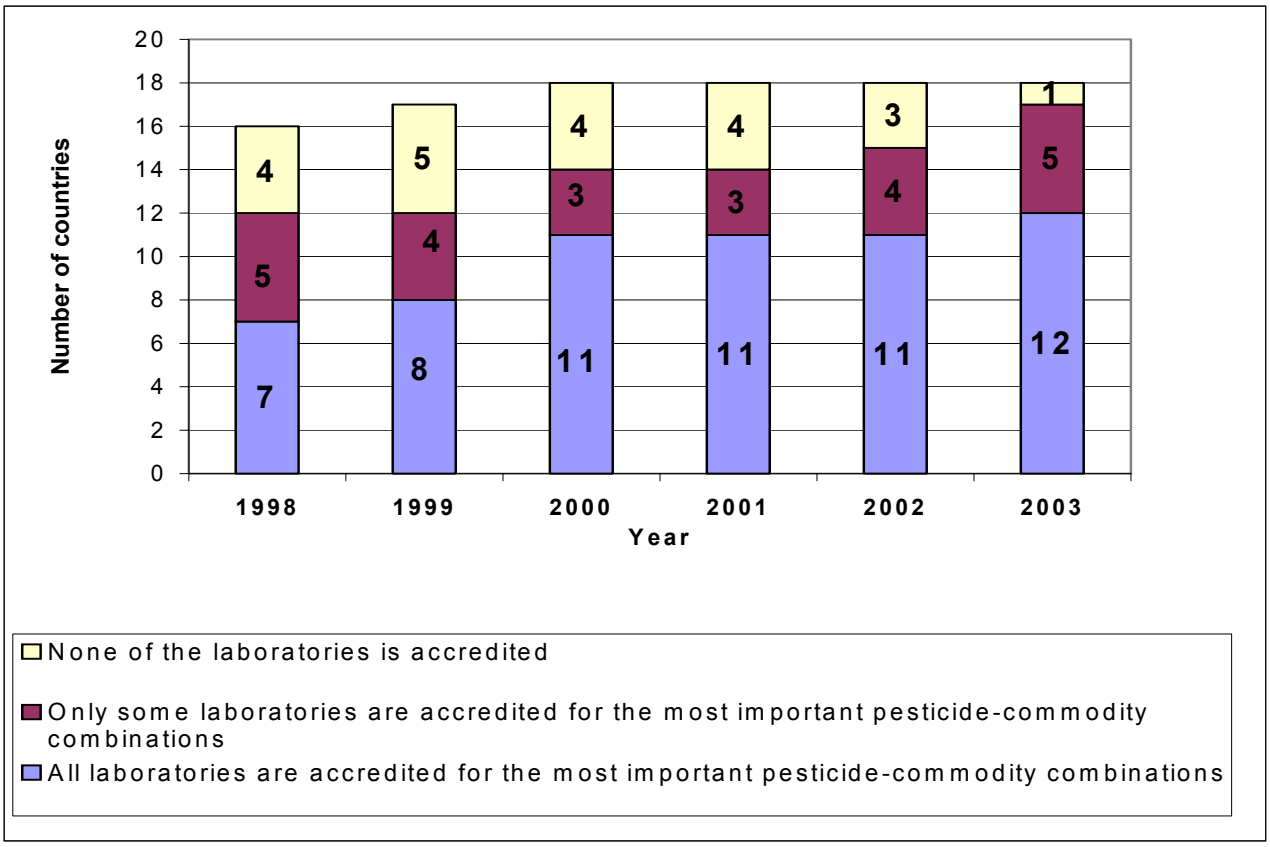

Figure 11: Number of countries with accreditation of all monitoring laboratories, of some monitoring laboratories and of none of the monitoring laboratories.

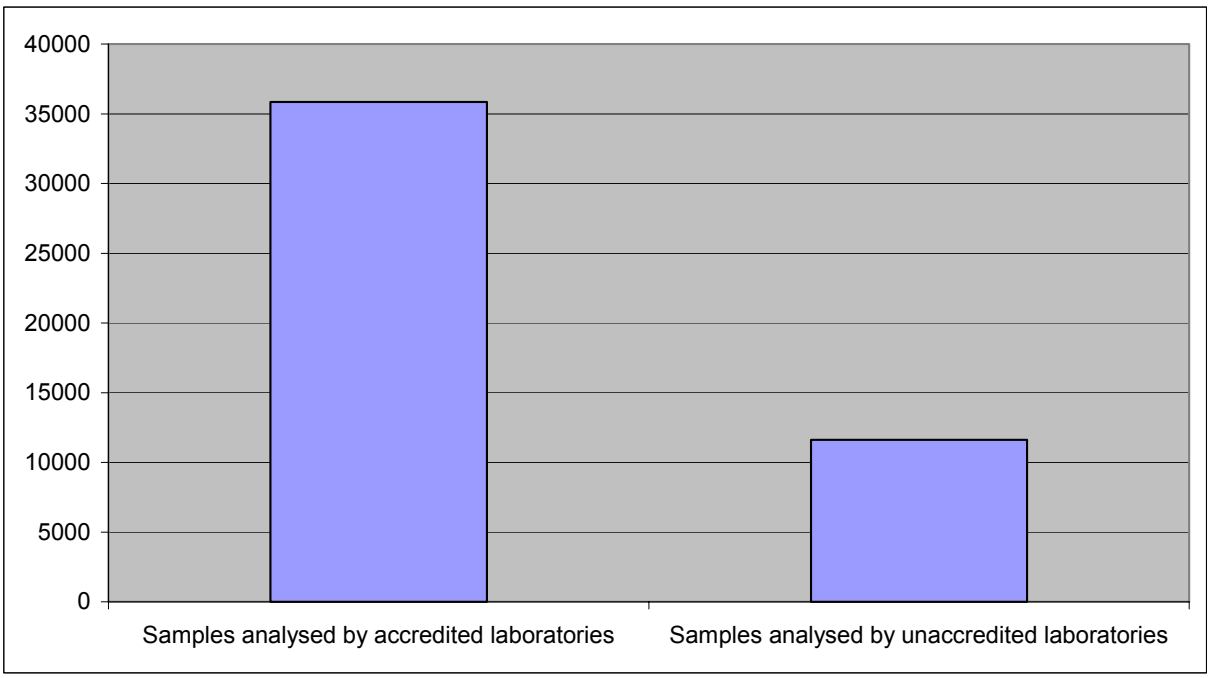

Figure 12: Numbers of samples analysed by laboratories accredited for the most important pesticide-commodity combinations and/or for only some pesticide-commodity combinations or by not accredited laboratories in the EU and EEA States in the year 2003

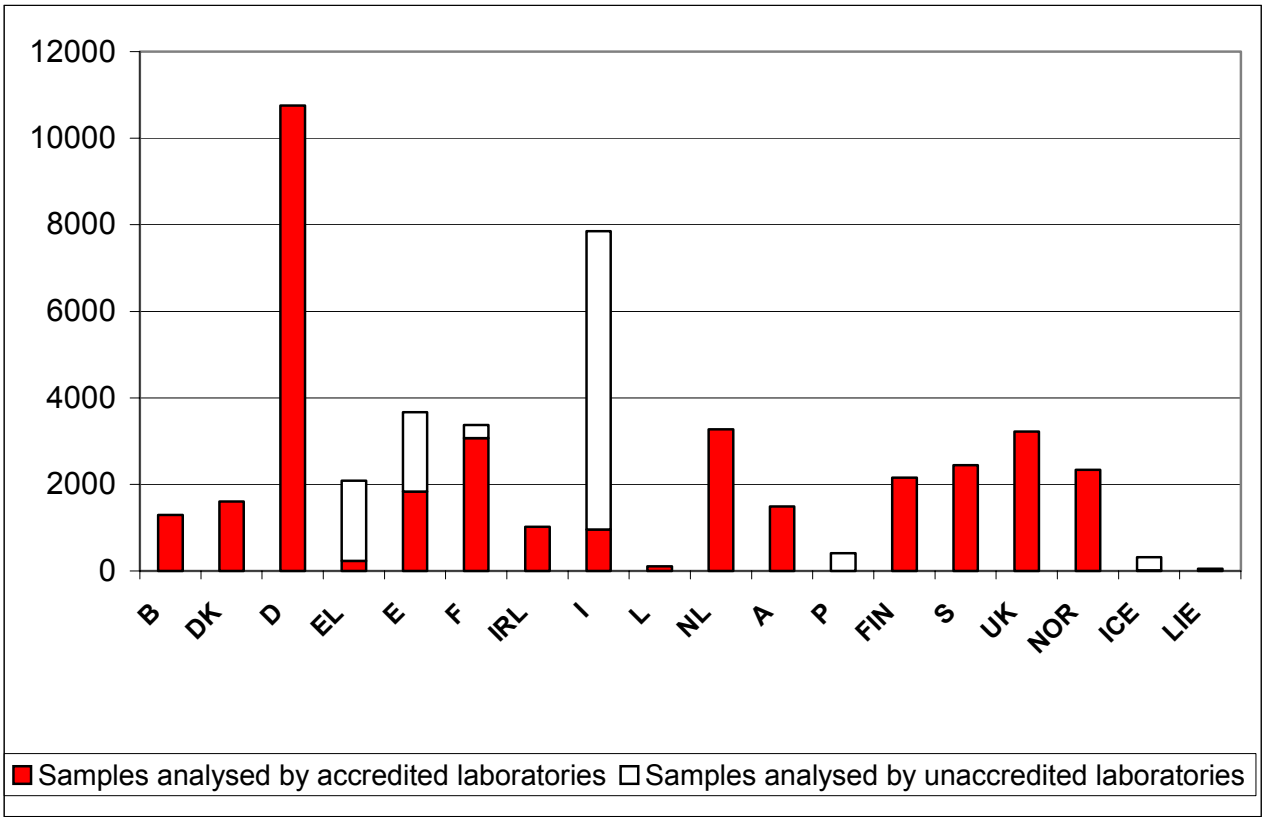

Figure 13: Numbers of samples analysed by laboratories accredited for the most important pesticide-commodity combinations and/or for only some pesticide-commodity combinations or by not accredited laboratories by country in the year 2003

In addition to the information on accreditation of laboratories, Table 32 gives an overview on other laboratory quality issues, such as the implementation of the EU QC procedures and the participation in proficiency tests. According to this information, 12 out of the 18 reporting countries have fully implemented at least 70% of the EU QC procedures. The remainder of the QC procedures is partly or fully implemented in most of the countries.

17 out of 18 countries also took part in proficiency tests in 2003. 16 out of 18 have participated in the EU proficiency test organised in 2003 and another often-used proficiency test scheme was FAPAS[35] (15 countries took part in some of the FAPAS rounds in 2003). Some countries also took part in other nationally or internationally organised proficiency tests (BIPEA, NFA, etc.).

35 Food analysis performance assessment scheme, a proficiency testing scheme organised by the UK

Table 32: Accreditation, participation in proficiency tests and implementation of the EU Quality Control Procedures of the pesticide residue laboratories

* Not applicable, because not yet accredited

Country	No. of laboratories	Accreditation	Accredi-tation certifi-cates provided	Participation in proficiency tests	Implementation of EU Quality Control Procedures (QC procedures)
B	3	Accredited by BELTEST	Yes	FAPAS and EU PT5[36]	All three laboratories have fully implemented from 70 to 100 % of the QC procedures, remaining percentage partly implemented.
DK	2 (1 main lab performing 97 % of all analyses)	Accredited by DANAK	Yes	FAPAS and EU PT5	In both laboratories fully implemented from 70 to 90 % of the QC procedures, remaining percentage partly implemented.
D	35	Accredited by AKS SAL	No	FAPAS, EU PT5, NFA [37] and other national PT	Different status of the application of QC procedures : full implementation between 60% and 100%
EL	8	1 accredited by E.Sy.D and the other in preparatory phase	No	EU PT5	The laboratories have fully implemented from 60 to 80 % of QC procedure , remaining percentage partly implemented.
E	14	4 ENAC accredited laboratories (doing approx. 50 % of the analyses). The others are in the preparatory phase.	Yes	National PT– EU PT5	All or parts of the QC procedures are implemented
F	6	5 laboratories, which performed around 90 % of the analyses, are fully accredited by COFRAC	Yes	BIPEA[38]- FAPAS- EU PT5	Different status of the application of QC procedures: full implementation between 50% and 90%
IRL	1	Accredited by INAB	Yes	FAPAS- EU PT5	At least 80 % of the QC procedures are fully implemented
I	42	18 laboratories are accredited by ISS-ORL and SINAL and performed at least all the analyses for the EU coordinated plan (12%)	No	EU PT5 – FAPAS – national PT	Different status of the application of QC procedures: full implementation between 50% and 80%

36 5th European Proficiency Test 2003 "Incurred and spiked residues of pesticides in an iceberg lettuce homogeneate"

37 Proficiency tests organised by the National Food Administration of Sweden

38 Proficiency tests organised by the Bureau Interprofessionnel d'Etudes Analitiques

Country	No. of laboratories	Accreditation	Accredi-tation certifi-cates provided	Participation in proficiency tests	Implementation of EU Quality Control Procedures (QC procedures)
L	1	Accredited by OLAS	Yes	FAPAS- EU PT5	At least 60 % of the QC procedures are fully implemented
NL	1	Accredited by RvA	Yes	FAPAS – EU PT5	All of the QC procedures are fully implemented
A	5	Accredited by BMWA and AKS	Yes	EU PT5 - other national PT - FAPAS	All or at least 80% of the QC procedures are fully implemented
P	3	None of the laboratories accredited yet	No	Two of the labs participated in FAPAS- EU PT5	The laboratories have partially implemented all parts of QC procedure, with fully implementation from 10 to 90%.
FIN	2	Accredited by FINAS	Yes	FAPAS- EU PT5	At least 70 % of the QC procedures are fully implemented
S	1	Accredited by SWEDAC	Yes	FAPAS- EU PT5	At least 70 % of the QC procedures are fully implemented
UK	3	Accredited by UKAS	Yes	FAPAS – EU PT5	Fully implemented
Norway	1	Accredited by NA	Yes	FAPAS- NFA- EU PT5	More than 80 % of the QC procedures are fully implemented
Iceland	2	One laboratory is accredited by SWEDAC(performing 5% of analyses) and one in preparatory phase	No	FAPAS	Approx. 90% of the QC procedures fully implemented, 10% not implemented
Liechte nstein	1	Accredited by DACH	Yes	Chemical analyses	At least 90 % of the QC procedures are fully implemented

8. RAPID ALERT SYSTEM

The Rapid Alert System for Food and Feed (RASFF) was established by Council Directive 92/59/EEC[39] on General Product Safety[40]. In February 2002, new provisions entered into force as laid down in Regulation (EC) 178/2002[41] of the European Parliament and of the Council.

Member States shall immediately notify the Commission under the Rapid Alert System whenever they have any information relating to the existence of a serious direct or indirect risk to human health deriving from food and feed and whenever they adopt measures to prevent the use of products entailing a serious risk to the health and safety of the consumer. Such notifications are classified as ALERT notifications. Consequently, the Commission notifies the Alert to the contact points in all Member States, which should take appropriate action and inform of any measure adopted.

Notifications which do not fulfil the above requirements but which are nevertheless regarded as important information, are forwarded by the Commission to the contact points in the Member States as information notifications (NON-ALERTS).

In 2003, the **ALERT** notifications regarding pesticide residues exceedances totalled 7 and **NON-ALERTS** totalled 47. Among the ALERTS, 3 were related to products from Member States and 4 to products from Third Countries.

With regard to the NON-ALERTS, 14 concerned products from Member States and 33 were related to products from Third Countries.

The commodities concerned were fruit and vegetables, only 2 NON-ALERTS concerned baby foods and 3 NON-ALERT concerned tea, herbs and spices.

Two main area of concern were identified in grape and peppers in relation to the high number of notifications on high level of residues detected mainly on imported products.

In total 23 notifications out of the total of 53 in 2003 concerned table grape, of them 6 were ALERTS. Among them, 19 were related to product imported from third countries mainly from India and only 4 from EU countries.

With regard to peppers, a total of 7 NON-ALERTS were launched for peppers imported from third countries, mainly from Turkey.

In 2003, the most frequently detected pesticides were insecticides: methomyl, monocrotophos and methamidophos. For methomyl, there were 10 NON-ALERTS (8 on grape) and 2 ALERTS on grape.

Monocrotophos pertained to a total of 7 notifications (6 on grape) , of them 2 being ALERTS on grape and fresh bean.

Methamidophos concerned in total 9 notifications (6 on peppers) of them 1 ALERT on grape.

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39 Official Journal No. L 228, 11/08/1992 p. 0024 - 0032

40 This Directive has been replaced by Directive 2001/95/EC of the European Parliament and of the Council from January 2004

41 Official Journal No. L 31, 01/02/2002 p. 0001 - 0024

The remaining 2 ALERTS were related to Parathion-methyl and Chlorpyrifos on grape.

The number of ALERTS and NON-ALERTS has decreased significantly compared to 2002, passing from 129 to 47 NON-ALERTS and from 43 to 7 ALERTS.

The rapid dissemination of information via the RASFF plays an important role in the Member States' planning of monitoring programmes, since it allows the identification of specific problems at an early stage and the adaptation of the sampling programmes accordingly, if necessary.

9. SUMMARY

9.1. National Monitoring programmes

All 15 Member States and the EFTA States who signed the EEA agreement[42] (Norway, Iceland and Liechtenstein), monitored pesticide residues in foodstuffs of plant origin as part of their national monitoring programmes. Overall, in 2003, about 47,500 samples were analysed. Member States analysed for as many as 519 different pesticides. About 92 % of the samples analysed were fresh (incl. frozen) fruit, vegetables and cereals, while about 8 % were processed products. These are the same proportions as in 2002.

Of the total, 58% of the samples contained no detectable residues, while a further 37% of the samples contained residues that were below or equal to the maximum residue limits (MRL) laid down at EU or national level. In 5.1 % of all samples, residues above the MRL (national or EC-MRL) were found. These are the same proportions as in 2002. When only fresh products are considered, the percentage of MRL exceedances is 5.5 % and the percentage of samples with no detectable residues is 56%. Again, these are the same proportions as in 2002.

The most frequently found pesticides in 2003 have been reported separately for fruit and vegetables and for cereals. Fungicides were mainly found on fruit and vegetables while the pesticides most often found on cereals were insecticides. The analytical possibilities of the laboratories continue to improve.

9.2. EU co-ordinated monitoring programme

In the special EU co-ordinated programme, eight commodities (cauliflower, sweet peppers, wheat, aubergines, rice, grapes, cucumber and peas) were analysed for 42 different pesticides.

Being a rolling programme, 3 of the commodities evaluated (cauliflower, sweet peppers, wheat) were the same as in 1999 and another 3 (rice, cucumber, peas) were evaluated in 2000. Grapes were evaluated in 1996, 2001 and 2003 but this is the first time that aubergines have been part of the EU co-ordinated programme. With regard to pesticides, all 20 of those analysed in 1998 to 2000 are included in the group of 42 analysed in 2003.

Although the total minimum number of samples recommended in the co-ordinated programme in the EU is constant (496 samples[43] every year), this number has been greatly exceeded in all previous years. In 2003, around 8600 samples were analysed, but not every sample was analysed for all 42 pesticides.

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42 Agreement on the European Economic Area

43 including EU Member States and Norway, Iceland and Liechtenstein

With regard to all eight commodities investigated, about 65 % of the samples were without detectable residues, 32 % of the samples contained residues of pesticides at or below the MRL (national or EC-MRL), and 3.2 % above the MRL.

Residues at or below the MRL were found most often in grapes (57 %), followed by peppers (34 %), cucumber (24 %) and wheat (22%). MRLs (including national or EC-MRLs) were exceeded most often in peppers (6 %) and grapes (5 %), followed by cucumber (3 %) and aubergines (3 %).

The most often detected* pesticide was procymidone (11 %* of all samples analysed for the substance), followed by maneb group (10 %), iprodione (5.9 %), chlorpyriphos (5.5 %), endosulfan (5 %) and benomyl group (4.5 %). Another group of pesticides had percentages varying from 1 % to under 4 %, among them pirimiphos-methyl (3.9 %), azoxystrobin (3.5 %), methomyl (2.4 %), methamidophos (2 %), chlorpyriphos-methyl (1.8 %), cypermethrin (1.8 %) malathion (1.8 %) and captan+folpet (1.6 %). For 23 out of 42 pesticides the frequency of samples with residues corresponded to less than 1 %.

The frequencies of MRL exceedances for single pesticide detections are all below 1%, except for methomyl, where 1.34% of all samples analysed exceeded MRL. The main other exceedances, in decreasing order are methiocarb (0.50 %), metalaxyl (0.48 %), methamidophos (0.33 %), benomyl group (0.31 %), acephate (0.29 %), dimethoate (0.27 %) endosulfan (0.24 %) and bromopropylate (0.22 %). For 12 substances no exceedance has been reported.

Except for the methomyl group, which exceeded MRLs most often in grapes (4.1 % of all samples), followed by metalaxyl in peppers (1.96 % of all samples), methiocarb in peppers (1.22 % of all samples), and captan+folpet in peas (1.15 %), all the other exceedances of pesticides for specific commodities were below 1%.

The most important pesticide-commodity combination where detectable residues were found (including those at or below the MRL and exceeding the MRL) was maneb-group/cauliflower where 26.5% of cauliflower samples had residues of this group of pesticides. This is followed by procymidone/grapes (22.4%), procymidone/peppers (17.9%), chlorpyriphos/grapes (17.3%), endosulfan/peppers (16.5%), iprodione/grapes (16.3%), maneb-group/grapes (14.3%), vinclozolin/peas (12.1%), pirimiphos-methyl/wheat (11.9%) and pirimiphos-methyl/peppers (10.5%).

With the commodities examined in 2003 having already been evaluated in 1999 (cauliflower, peppers, and wheat), 2000 (rice, cucumber and peas) and 2001 (grapes - also evaluated in 1996), we can get a comparative picture over time. The overall time-comparative picture on residues exceeding the MRL is one where there has been just 1 notable increase in frequency (metalaxyl on peppers - 1.96% of samples exceeded MRL in 2003), while there have been notable declines for 6 other pesticide/commodity combinations. The declines are for methamidophos/peppers, maneb-group/cauliflower, maneb-group/peas, maneb-group/rice, benomyl-group/peas and maneb-group/cucumber. The percentages of exceedances for the time-comparable pesticide/commodity combinations are now all below 1% in 2003, except for the aforementioned metalaxyl on peppers.

The overall comparative picture on residues at or below the MRL is one where there has been little or no change in many pesticide/commodity combinations. Although some

* Percentages include sum of samples with residues at or below the MRL and exceeding the MRL.

pesticide/commodity combinations have had a notable increase in the frequency of samples with residues, there have been a roughly similar number of cases where the frequency has had a notable decline.

On all eight commodities as a whole, pesticides samples in 2003 have had a frequency of detection lower than in 2002 and similar to the average of previous years. However, data are not completely comparable given that commodities and pesticides evaluated were different in the various years. It should also be borne in mind that comparison is difficult due to the fact that MRLs have changed from 1999 to 2003. For example, in the case of metalaxyl on peppers the MRL was reduced in 2000 to the limit of determination and the increase in the frequency of exceedance mentioned above should be seen in this context.

Chronic exposure assessments demonstrate that the intake of pesticides remains clearly below the ADI[44] and there is no concern of chronic toxicity. However, for the assessment of acute exposure, the data show that the acute RfD[45] was exceeded in nine cases.

9.3. Quality assurance and sampling

Samples for the national and the EU co-ordinated programmes were taken at different points such as retailers, wholesalers, markets, points of entry and processing industries. National sampling plans exist in most countries, taking into consideration e.g. consumption data; production figures import/export relation and risks (e.g. results from previous years).

Accreditation of laboratories has been completed in some of the countries, whereas in other countries accreditation has been achieved only for some of the laboratories. Although there was some progress in 2003 compared to 2002 in the accreditation status of laboratories, there were only 12 out of 18 countries (about 67 %) which have all their laboratories accredited. The remaining 6 countries have either some but not all of their laboratories accredited or are still in the preparation phase for accreditation.

With regard to the monitoring samples (national and EU programmes) taken in the EU and EEA States, approximately 75.5% were analysed by accredited laboratories and 24.5% analysed by laboratories which were not accredited.

However, it can also be stated that considerable improvements have been made in the EU and EEA States with the implementation of the EU QC procedures. In the majority of the participating countries at least 70% the EU QC procedures have been fully implemented.

17 out of 18 countries reported that they took part in proficiency tests in 2003 and 16 out of 17 have participated in an EU proficiency test organised in 2003. In addition, 15 countries took part in some of the FAPAS[46] rounds in 2003.

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44 Acceptable Daily Intake

45 Acute Reference Dose

46 Food analysis performance assessment scheme, a proficiency testing scheme organised by the UK