PESTICIDE RESIDUES COMMITTEE

PESTICIDE RESIDUES MONITORING REPORT

FOURTH QUARTER RESULTS

(REVISION 1)

OCTOBER - DECEMBER 2001

INTRODUCTION

Background

The Government's pesticide residues surveillance programme is overseen by the Pesticide Residues Committee (PRC). The Chairman is Dr Ian Brown, consultant occupational physician and toxicologist at Southampton University Hospitals. The members have academic, food industry or consumer backgrounds. Information on the membership of the PRC is also available on the PRC's website:
www.pesticides.gov.uk/committees/PRC/prcmembersweb.html

The PRC's role is to advise Ministers and the Chief Executives of the Pesticides Safety Directorate (PSD) and the Food Standards Agency (FSA) on:

- the planning of surveillance programmes for pesticide residues in the UK food supply and the evaluation of the results;

- procedures for sampling, sample processing, new methods of analysis, the assessment of variability of pesticide residues in food and related issues.

Reporting of results

This is our second year of reporting the results from the pesticide residues surveillance programme on a quarterly basis. More frequent reporting has reduced the time between sample collection and publication of results to ensure that results reflect an up to date picture of any residues which may be present in food. More importantly, it also ensures that action can be taken more quickly in order to have an impact on the quality of future supplies. Details of the action that has been taken is included with the individual results.

To make the most of resources the programme takes the form of 'rolling surveys'. In other words much of the programme changes from year to year. Further general information and explanatory details on the PRC's monitoring programme is available for reference on the PRC website:
www.pesticides.gov.uk/committees/PRC/PRC_annual_rep_2000.pdf

This report gives results for surveys carried out in the fourth quarter of 2001. Samples were generally taken between October to December, however some commodities sampled for the first part of this year (i.e. between January to September) are also reported here. To ensure that the target number of samples was met, a few samples may have been collected post-December. Results for the first, second and third quarter of 2001 have been published on the website:
www.pesticides.gov.uk/committees/PRC/firstq2001/q1rep-01.pdf
www.pesticides.gov.uk/committees/PRC/secondq2001/q2report2001.pdf
www.pesticides.gov.uk/committees/PRC/thirdq2001/q3report.pdf

A number of samples intended to be reported in the Q4 report had been unfortunately delayed due to analytical difficulties, e.g. the method of analysis for a pesticide residue may work well for wheat, but may fail when applied to bread which is made from wheat, therefore a different method needs to be developed for wheat. These commodities have now been completed and the results are incorporated into this revised Q4 report (Revision 1). The new commodities included in this report are:

apples – EU survey
infant food (meat/fish/egg based) – second part
orange juice
courgette
marrow
eggs
yoghurt/fromage frais

PESTICIDE RESIDUE SURVEILLANCE RESULTS - QUARTER 4

SUMMARY

This report covers surveys of commodities which have been tested as part of the PRC's surveillance programme for 2001. Some of the commodities are reported over more than one quarter, and therefore it may state 'first part' or 'second part' etc..

This report includes surveys of:

Samples for these surveys were collected in the main from October to December.

The survey of apples, lettuce, strawberries, tomatoes and one of the grape surveys, were carried out as part of a co-ordinated EU programme under which all Member States carry out surveys of the same produce.

The results are presented in Tables 1-30 and brand name information is in Annex 1. Samples with residues above the MRL are reported in Table H. Samples of UK produce containing non-approved pesticide residues are reported in Table I.

Risk assessments have been carried out for residues found at levels which are above their respective MRLs. In the cases where there are no MRLs a risk assessment has been carried out. Where the commodity is a processed food, a comparison of the MRL(s) for the raw ingredients has been included in the report in the section on 'Dietary Intake Implications'.

A summary of the results detailed in this quarter 4 2001 report can be found in Tables A and B (below).

Table A: Summary of the results of the fruit and vegetable commodities tested for Quarter 4 2001

Commodity	N° of samples analysed	N° of samples containing residues	N° of samples containing multiple residues	N° of samples containing residues above the MRL*	N° of UK samples containing non-approved pesticide residues**
apples (EU survey)	252	68 (27%)	29 (12%)	0 (0%)	(0%)
celery	72	45 (63%)	12 (17%)	3 (4%)	2 (5%)
courgette	73	3 (4%)	2 (3%)	0 (0%)	0 (0%)
grapefruit	72	60 (83%)	32 (44%)	0 (0%)	N/A
grapes (EU survey) (third part)	18	7 (39%)	4 (22%)	0 (0%)	N/A
grapes (special survey)	96	15 (16%)	0 (0%)	2 (2%)	N/A
lemons (second part)	27	25 (93%)	22 (81%)	0 (0%)	N/A
lettuce (EU survey)	180	54 (30%)	17 (9%)	2 (1%)	2 (1%)
mango (second part)	36	13 (36%)	1 (3%)	1 (3%)	N/A
marrow	59	0 (0%)	0 (0%)	0 (0%)	0 (0%)
mushrooms	155	14 (9%)	1 (1%)	1 (1%)	3 (2%)
peaches (second part)	15	11 (73%)	8 (53%)	2 (13%)	N/A
nectarines (second part)	19	10 (53%)	4 (21%)	1 (5%)	N/A
potatoes (maincrop and new)	239	80 (33%)	18 (8%)	3 (1%)	0 (0%)
soft citrus	72	72 (100%)	68 (94%)	1 (1%)	N/A
star fruit (second part)	29	5 (17%)	0 (0%)	3 (10%)	N/A
strawberries (EU survey)	179	115 (64%)	68 (38%)	4 (2%)	2 (1%)
tomatoes (EU survey)	144	26 (18%)	8 (6%)	0 (0%)	0 (0%)

* EC and UK MRLs are statutory MRLs included in the Pesticides (Maximum Residue Levels in Crops, Food and Feeding Stuffs) (England and Wales) Regulations 1999 (as amended). Codex MRLs are non-statutory MRLs established by the Codex Alimentarius Commission.
**Calculated as the number and percentage out of the total UK origin samples tested.
N/A applies because the commodity is not grown in the UK.

Table B: Summary of the results of all other commodities tested for Quarter 4 2001

Commodity	N° of samples analysed	N° of samples containing residues	N° of samples containing multiple residues	N° of samples containing residues above the MRL*$
bran	47	40 (85%)	34 (72%)	0 (0%)
bread (ordinary)	144	55 (38%)	1 (1%)	0 (0%)
bread (savoury)	72	6 (8%)	1 (1%)	0 (0%)
cow's milk (quarter 4)	59	0 (0%)	0 (0%)	0 (0%)
eggs	72	0 (0%)	0 (0%)	0 (0%)
infant food (meat/fish/egg based) (second part)	76	6 (8%)	0 (0%)	0 (0%)
orange juice	71	0 (0%)	0 (0%)	0 (0%)
Pizzas (second part)	24	2 (8%)	0 (0%)	0 (0%)
processed potato products (second part)	84	22 (26%)	2 (2%)	0 (0%)
salmon (canned) (second part)	108	26 (24%)	1 (1%)	0 (0%)
salmon (fresh)	73	71 (97%)	32 (44%)	0 (0%)
tea (second part)	48	5 (10%)	3 (6%)	0 (0%)
yoghurt/fromage frais	120	0 (0%)	0 (0%)	0 (0%)

* EC and UK MRLs are statutory MRLs included in the Pesticides (Maximum Residue Levels in Crops, Food and Feeding Stuffs) (England and Wales) Regulations 1999 (as amended). Codex MRLs are non-statutory MRLs established by the Codex Alimentarius Commission.
$ MRLs may be extended to composite and processed products but levels are not specifically laid down in legislation. They are derived by calculation on an individual basis.

A number of samples were found to contain multiple residues. The Advisory Committee on Pesticides (ACP) has looked at this in the past. The Committee concluded (on the basis of the evidence available at the time) that at the very low levels at which they occur, pesticide residues were unlikely to act synergistically. However, the issue remains under review and the Food Standards Agency has asked the Committee on Toxicology (COT) to look again at this issue generally known as the 'cocktail effect'. A working group of the COT (known as the Working Group on the Risk Assessment of Mixtures of Pesticides (WiGRAMP)) is working on this and has recently published its draft findings. The main aim of the working group is to assess the potential for interaction between mixtures of pesticides/veterinary medicines at residue levels, and to determine whether such mixtures at the levels which they are present are likely to result in adverse effects on human health. Further information can be found at:
www.food.gov.uk/science/ouradvisors/toxicity/COTwg/wigramp.
The PRC will be considering the recommendations in the report when the final version is published.

In recognition of the loss of chlorothalonil in certain commodities during sample processing, the samples from some of the surveys included in the 2001 programme were 'cryogenically milled'. It has been shown that chlorothalonil cannot be recovered from a number of commodities, such as lettuce, when processing is performed at ambient temperatures. These losses are believed to be due to chemical and/or enzymatic reactions

between chlorothalonil and the sample matrix, as cell disruption is initiated. These reactions slow down as the temperature is reduced. Hence, by freezing the sample and processing in the presence of 'dry ice' the losses of chlorothalonil can be minimised, and in many cases are completely eliminated.

There is no evidence that the PRC's results for the majority of pesticides have under-estimated the residues present. For the small number of pesticides which have been, or may be, proven to degrade during processing at room temperature, it is probable that similar losses would occur during domestic processing and eating.

This report also includes information on brand names (see Annex I). However, the number of samples per brand are generally small and this means that results from an individual survey cannot be taken as a fair representation of the residues status of any particular brand. The programme is not designed to generate statistically valid information on residues in particular crops. However, the programme should generate information on the typical residues profile of particular types of produce and on major trends in the incidence and levels of pesticides.

RESULTS FROM SAMPLES COLLECTED BETWEEN OCTOBER TO DECEMBER 2001

FRUIT AND VEGETABLE SURVEYS (EXCLUDING TROPICAL FRUIT AND VEGETABLES)

Grapes EU (Table 1)

Introduction

Two grape surveys were carried out during 2001; an EU survey and a special survey. The survey reported below was carried out as part of the co-ordinated EU programme. Grapes were surveyed in this and previous surveys because they are widely consumed. Results of previous surveys show that they can contain a relatively wide range of residues. This is due to the fact that grapes are susceptible to insect and fungal attacks that can damage the crop appearance which is a measure of its value. This report covers grapes sampled between October and December.

A number of recently approved fungicides for use on grapes from the strobilurin group, such as azoxystrobin, have been sought for the first time.

Results October to December 2001

A total of 18 samples of grapes were tested for 31 pesticide residues. Samples of grapes were from Brazil (2), Greece (1), Italy (4), Spain (2), USA (6) and unknown origin (3). Residues were found in 7 (39%) samples tested. Procymidone (MRL 5 mg/kg) was found in 6 (33%) samples ranging from 0.03 to 1.3 mg/kg. Procymidone is a fungicide, used to control plant diseases such as *Botrytis* and *Sclerotinia*. Azoxystrobin (MRL 2 mg/kg) was found in 3 (17%) samples ranging from 0.1 to 0.3 mg/kg. Other residues found below their respective MRLs were: chlorpyrifos-methyl (2 samples), dimethoate (1 sample), iprodione (1 sample) and omethoate (1 sample). One sample of grapes contained dimethoate (MRL 1 mg/kg) and omethoate (MRL 1 mg/kg) at 0.08 and 0.07 mg/kg. See the section on 'Dietary Intake Implications' for full details of the risk assessment. However, none of the residues found caused concern for consumer health. The samples containing residues originated from Italy, Greece, Spain or unknown origin. Two residues were found in 3 samples, and one sample from Italy contained 5 residues. No MRLs were exceeded. None of the samples tested were labelled as organic.

Previous survey results

Results July to September 2001

A total of 18 samples of imported grapes were tested for 31 pesticide residues. Samples of grapes were from Spain (6), Greece (6), Italy (4), Israel (1) and Egypt (1). Residues were found in 10 (56%) samples tested.

Procymidone (MRL 5 mg/kg) was found in 8 (44%) samples ranging from 0.08 to 0.5 mg/kg and azoxystrobin (MRL 2 mg/kg) was found in 4 (22%) samples ranging from 0.05 to 0.3 mg/kg. Two fungicides, iprodione and vinclozolin, were found in 2 and 1 samples respectively, at levels below their respective MRLs. The samples containing residues originated from Italy, Greece or Spain. Two multiple residues were found in 5 samples. Two samples labelled as organic were tested and neither contained residues. No MRLs were exceeded. These results were reported in the Q3 2001 report on the website (www.pesticides.gov.uk/committees/PRC/thirdq2001/q3report.pdf).

Results January to June 2001

A total of 36 samples were tested, 32 (89%) imported and 4 (11%) of unknown origin. No organic samples were purchased. Residues were found in 22 (61%) of the samples. The fungicide, captan (MRL 3 mg/kg), was found in 12 (33%) samples ranging from 0.06 to 1.7 mg/kg. Another fungicide, iprodione (MRL 10 mg/kg), was found in 10 (28%) samples ranging from 0.2 to 1.0 mg/kg. Azoxystrobin was found in two imported samples at low levels and below its MRL of 2 mg/kg. Generally, the majority of samples containing residues were from Chile or South Africa. No MRLs were exceeded. These results were published in the Q2 2001 report on the website (www.pesticides.gov.uk/committees/PRC/secondq2001/q2report2001.pdf).

Results from 1999

A survey of grapes was carried out in 1999 and the results were reported in Q2 2000 (www.pesticides.gov.uk/committees/PRC/secondq2000/q2rep-00.pdf). Seventy two samples of table grapes were analysed and residues were detected in 48 (67%) of the samples, with multiple residues of up to five in 21 (29%) of the samples. MRLs, where set, were exceeded by 5 samples, 4 of which contained up to 5 residues.

Conclusion

The residue profiles for the results from October to December 2001 are similar to those for July to September 2001, but quite different to those for January to June 2001. Captan was not found in the latest results, whereas procymidone was found in 6 samples at levels below the MRL. This reflects the different sources of grapes throughout the year; in the first half of the year, grapes are mainly sourced from Chile and South Africa, whereas for the second half of the year the grapes originated mainly from European sources. None of the residues found in these latest results were of any concern for consumer health.

It is not appropriate to make a direct comparison of the results from the quarter results in 2001 surveys with the previous 1999 survey as the range of pesticides sought are different. However, it is noted that in 1999 about two-thirds of the samples tested contained residues, whereas in this 2001 survey just over half of the samples tested contained residues. There were no MRL exceedances in the 2001 survey results compared to 5 occurrences in the 1999 survey results involving chlorpyrifos, chlorpyrifos-methyl, deltamethrin and methamidophos. These residues were targeted in this and the special

grape survey reported below. The results seem to indicate an improvement (i.e. reduced level of pesticide residues and MRL exceedances) for grapes tested in this 2001 survey. We are carrying out a further survey of grapes in 2002.

Grapes Special survey (Table 2)

Introduction

Two grape surveys were carried out during 2001; an EU survey and a special survey. The survey reported below was carried out as a special survey to target pesticide residues which have previously been identified as a consumer concern either from earlier surveillance results, the EU Rapid Alert System, or intelligence (further information on rapid alerts can be found on the PSD website at: www.pesticides.gov.uk/citizen/residues/other/other_residues.htm.

Results 2001

A total of 96 samples of grapes were tested for 10 residues. Ninety samples were imported and 6 samples of unknown origin. Of the imported samples, the majority were from Greece, Spain and USA. Residues were found in 15 (16%) samples tested. Chlorpyrifos (MRL 0.5 mg/kg) was found in 10 samples ranging from 0.05 to 1.4 mg/kg. Two of these samples were found to contain residues above the MRL at 0.6 mg/kg and 1.4 mg/kg. Chlorpyrifos is an organophosphorus insecticide widely used on grapes. Parathion-methyl (no MRL) was found in 3 samples ranging from 0.05 to 0.1 mg/kg. See the section on 'Dietary Intake Implications' for full details of the risk assessments. However, none of the residues found caused concern for consumer health. Other residues found below their respective MRLs were: dimethoate (1 sample), fenvalerate (1 sample). None of the samples tested contained multiple residues of those pesticides sought. One organic sample was tested and did not contain any residues.

Conclusions

Chlorpyrifos was found in 2 samples exceeding the MRL. One sample was from Spain and one of unknown origin. A risk assessment has shown that the levels are not of concern for consumer health. It is not appropriate to compare these results to the EU survey carried out in 2001, as this survey was specifically designed to target those residues which are of concern. Due to the MRL exceedance, we have written to the Spanish authorities notifying them of this result. A further survey of grapes is planned for 2002 which is intended to look for chlorpyrifos residues amongst others.

Peaches and Nectarines (Table 3)

Introduction

Peaches/nectarines were sampled in 2001 as part of the rolling programme for commonly eaten fruit and vegetables. This is the second part of the results from samples collected in July to October of 2001. The results for April to June of 2001 were reported in the Q3 2001 report (www.pesticides.gov.uk/committees/PRC/thirdq2001/q3report.pdf).

Results July to October 2001

A total of 34 samples (19 nectarine and 15 peach) were tested for 100 pesticide residues.

Nectarines

A total of 18 imported samples and one of unknown origin were tested. The majority of the imported samples were from Italy (12). Residues were found in 10 (53%) samples. Nine pesticides were found. There were two MRL exceedances, both in the same sample from Italy. Methamidophos (MRL 0.05 mg/kg) was found at 0.06 mg/kg, and acephate (MRL 0.02 mg/kg) was also found at 0.1 mg/kg. (The MRL for acephate changed from 0.2 mg/kg to 0.02 mg/kg with effect from 1st July 2001). Acephate and methamidophos are organophosphorus insecticides used to control pests such as aphids and thrips. Bromopropylate (no MRL) was found in one sample at 0.1 mg/kg and fenpropimorph (no MRL) was found in one sample at 0.06 mg/kg. See the section on 'Dietary intake implications' for full details on the risk assessments for the MRL exceedances and the residues where there is no MRL. Multiple residues of up to 3 residues were found in 4 samples. No organic samples were purchased. Chlorfenvinphos was sought but not found.

The acute risk assessment for methamidophos shows that the acute reference dose is exceeded for some consumers, however, although the safety margins built into the ARfD would be eroded, adverse health effects would be unlikely. There is no concern for consumer health from the levels of acephate also found in this sample. However, due to the MRL exceedances we have contacted the Italian authorities notifying them of this incident. None of the other residues found gave concern for consumer health.

Peaches

A total of 15 imported samples were tested. The peaches originated from Italy (8), France (6) and Spain (1). Residues were found in 11 (73%) samples. Eight residues were found. There were 2 MRL exceedances. Methamidophos was found in 2 French samples at 0.09 mg/kg and 0.4 mg/kg. Acephate was sought but not found. See the section on 'Dietary intake implications' for full details on the risk assessments for the 2 MRL exceedances. Risk assessments have shown that although the safety margins built into the ARfD would have been significantly eroded for the residue of 0.4 mg/kg and eroded for the residue of 0.09 mg/kg, adverse health effects would be unlikely to result from these exceedances. Multiple residues

of up to 3 residues were found in 4 samples. No organic samples were purchased. Chlorfenvinphos was sought but not found.

Due to MRL exceedances we have contacted the French authorities notifying them of this incident.

Previous survey results

Results April to June 2001

A total of 36 samples (17 nectarine and 19 peach) were tested for 100 pesticide residues. The results were published in the Q3 2001 report on the website (www.pesticides.gov.uk/committees/PRC/thirdq2001/q3report.pdf).

Nectarines
A total of 16 imported samples and one of unknown origin were tested. The majority of the imported samples were from Spain (12). Residues were found in 8 (47%) of the samples. Iprodione (MRL 5 mg/kg) was the most commonly occurring residue. It was found in 5 (29%) samples ranging from 0.1 to 1.2 mg/kg. Fenitrothion (MRL 0.5 mg/kg) was found in 2 (12%) samples at 0.03 and 0.3 mg/kg. There were 2 MRL exceedances, both were in the same sample from Spain; acephate (MRL 0.2 mg/kg) was found at 0.4 mg/kg and its metabolite, methamidophos (MRL 0.05 mg/kg), was found at 0.1 mg/kg. The risk from acephate did not cause concern for consumer health, however, an acute risk assessment for methamidophos showed that the short term intakes were higher than the ARfD. This exceedance was unlikely to result in any ill effects, although the safety margins had been eroded. Two multiple residues were found in 2 samples of nectarines. Chlorfenvinphos was sought but not found. No organic samples were purchased.

Due to MRL exceedances and the potential consumer concerns over the levels of methamidophos found, the Spanish authorities were notified of this incident.

Peaches
A total of 18 imported samples and one of unknown origin were tested. The majority of the imported samples were from Spain (11) and Italy (5). Residues were found in 6 (32%) of the samples. The organophosphorus (OP) insecticide fenitrothion (MRL 0.5 mg/kg) was the most common residue. It was found in 4 (21%) samples ranging from 0.01 to 0.04 mg/kg. One sample, originating from Spain, contained residues of acephate and methamidophos at their MRLs of 0.2 and 0.05 mg/kg, respectively. One sample of peaches contained parathion-methyl (no MRL) at 0.05 mg/kg. Multiple residues were found in 4 samples, up to 3 multiple residues. Chlorfenvinphos was sought but not found. None of the residues found were of concern for consumer health. No organic samples were purchased.

Results 1998

In the survey of peaches and nectarines carried out in 1998, residues were detected in 39 (54%) of the 72 samples analysed (35 nectarines and 37 peaches samples). The majority of imported nectarines were from Spain (12) and Italy (9). The majority of imported peaches were from Italy (18), Spain (6) and France (6). Multiple residues of 2 or 3 pesticides were detected in 13 (18%) samples. Methamidophos (no MRL set at that time) was found in 4 samples of nectarines ranging from 0.03 to 0.07 mg/kg. Acephate (no MRL set at that time) was found in 2 samples of nectarines at 0.02 and 0.03 mg/kg. No MRLs were exceeded. Peaches and nectarines were also surveyed in 1997 when 100 samples were analysed; residues were detected in 35 (35%) of the samples. The chlorfenvinphos MRL was exceeded in two samples.

Conclusion

One sample of nectarines and 2 samples of peaches were found to contain residues exceeding their MRLs. The Italian and the French authorities have been notified of these results accordingly. The results for the second half of 2001 are comparable to those from the first half, although any differences may be attributable to the different sources of imported peaches and nectarines during the year. For 2001, a total of 70 samples, 36 nectarines and 34 peaches were sampled. Fifty percent of the peaches and 50% of the nectarines were found to contain residues. The results overall show an improvement in chlorfenvinphos residues, as no residues were found in the 2001 survey compared to the 2 MRL exceedances found in the 1997 survey. The results for 2001 appear to show an increase in MRL exceedances (5 exceedances) compared to 1998 when there were no MRL exceedances. This is because in 1998, methamidophos and acephate did not have any MRLs set, but these have since been introduced. Therefore, the results overall for 2001 are comparable to those in 1998.

One sample of nectarines was found to contain residues of methamidophos above the MRL and two samples of peaches were found to contain methamidophos above the MRL. Although the safety margins would have been eroded, in one case significantly, adverse health effects would be unlikely. However, due to the MRL exceedances we have contacted the Italian and French authorities and we will be carrying out a further survey of nectarines and peaches for 2002 and methamidophos and acephate will be targeted in this survey.

Celery (Table 4)

Introduction

Celery has been sampled regularly as part of the rolling programme, mainly due to concerns over MRL exceedances in imported sources, in particular of Spanish origin (the main source of imported celery). Previous surveys have also highlighted problems with residues in organic produce.

Results 2001

A total of 72 samples of celery were tested for 106 pesticide residues. Forty-four (61%) of the samples were UK origin, 27 (38%) were imported (mainly from Spain) and 1 (1%) were of unknown origin. Forty-five (63%) samples were found to contain residues. Chlorothalonil and fenitrothion were the most common residues, found in 50% and 8% of samples, respectively. There were 4 (6%) MRL exceedances involving iprodione, cypermethrin and diazinon and 2 UK non-approved uses involving iprodione (one of these was also an MRL exceedance). Iprodione (MRL 0.02 mg/kg) was found in 2 UK samples at 0.02 mg/kg and 0.06 mg/kg. Cypermethrin (MRL 0.05 mg/kg) was found in 2 samples at 0.07 and 0.5 mg/kg. The second sample also contained diazinon (MRL 0.02 mg/kg) at 0.5 mg/kg. As iprodione is not approved for use on celery in the UK, these constitute illegal uses, and one of them also an MRL violation. The finding of iprodione residues in UK celery was also considered to be atypical, although it may be being used to control *Sclerotinia*. A number of residues were found where there is no MRL; chlorpropham was found ranging from 0.02 to 0.2 mg/kg; cyhalothrin was found ranging from 0.02 to 0.03 mg/kg and dichlofluanid was found at 0.09 mg/kg. Risk assessments (see the section on 'Dietary intake implications' for full details) have shown that none of the residues found were of concern for consumer health. Residues of chlorpropham (a herbicide) approved for use on celery were found in 4 UK samples. This is significant as it is the first detection of this residue from a pre-harvest use, and it is unusual to find residues of herbicides. The residues found were not of concern for consumer health. It is thought that these residues are associated with celery which has not been washed i.e. 'dirty celery' and that the residue is likely to remain in the soil on the celery. In practice, the soil would be washed from the celery prior to consumption, and therefore any residues of chlorpropham would also likely be removed. Twelve (17%) samples were found to contain up to 4 multiple residues. Five of the samples tested were labelled as organic and did not contain any residues.

Previous survey results

Results 1999

In the survey of celery carried out in 1999, residues were detected in 49 (72%) of the 68 samples analysed; 2 pesticide residues were found in 18 (26%) of the samples and one sample contained 3 different pesticide residues. One sample contained a high residue of disulfoton (0.2 mg/kg), but a risk assessment showed that this was within the ARfD. No residues of phorate were detected. Five samples from Spain contained residues above the MRL; the three exceedances for procymidone and one for methamidophos all related to MRLs set at the limit of determination of 0.01 mg/kg. The carbendazim MRL exceedance was not considered significant as it was within the analytical variation of the method of analysis.

Conclusion

The latest results show that 63% of the samples tested contained residues. The results for this survey suggest a slight improvement on the previous

survey carried out in 1999, where 72% of the samples tested contained residues. Procymidone and methamidophos were not found in the latest survey. However, there continues to be a number of MRL exceedances and additionally 2 non-approved UK uses. We have notified the brand owners of these samples. We have also notified the Spanish authorities of these findings.

Grapefruit (Table 5)

Introduction

This survey was conducted as part of the rolling programme of fruit. Only fresh grapefruits were sampled. Grapefruit is imported all year round, but the source can change depending on the time of year.

This grapefruit survey considers residues in food and one substance, 2-phenylphenol, which is classified as a pesticide but is controlled under the *Miscellaneous Food Additives Regulations 1995 (S.I. 1995 No. 3187).* It does not have an MRL, but instead has a permitted limit (PL) expressed as mg/kg.

Results 2001

A total of 72 samples of grapefruit were tested for 29 pesticide residues. Sixty three (88%) of the samples were imported, and 9 (12%) were of unknown origin. Of the imported samples, the majority were from South Africa, Israel and Turkey. Sixty (83%) of the samples tested were found to contain residues. There were no MRL exceedances. Tetradifon (no MRL) was found in 2 samples ranging from 0.09 to 0.1 mg/kg. A risk assessment (see the section on 'Dietary intake implications' for full details) has shown that although the safety margins would have been eroded, adverse health effects would be unlikely. The most common residues found were as follows: imazalil found in 44 (61%) samples; 2,4-D found in 23 (32%) samples; 2-phenylphenol found in 11 (15%) samples; chlorpyrifos found in 10 (14%) samples; and thiabendazole found in 10 (14%) samples. Thirty-two (44%) samples were found to contain multiple residues, up to 5 residues in one sample from Turkey. None of the samples were labelled as organic.

Previous survey results

Results 1994

In the 1994 grapefruit survey, residues were detected in 20 (80%) out of the 25 imported samples tested. Samples originated from Israel (8), Cyprus (6), South Africa (7), USA (1) and unknown (3). All the samples containing residues were also found to contain multiple residues, up to 5 in one sample from Cyprus. None of the samples contained residues above their respective MRLs or permitted levels (in the case of food additives). The most commonly occurring pesticides were imazalil (found in 13 (52%) samples tested), 2-phenyl phenol (found in 14 (56%) samples tested) and thiabendazole (found in 19 (76%) samples tested).

Conclusion

These latest results show that 83% of the samples tested contained residues. These results are comparable to the previous survey findings. A risk assessment for tetradifon residues showed that the safety margins would be eroded, however adverse health effects would be unlikely.

Lemons (Table 6)

Introduction

This report covers lemons sampled between June and December. Results for lemons sampled between January and May were reported in the quarter 2 2001 report. The survey was split to reflect the differences in the sources of imported lemons, and hence potentially differentiate between farming practices including pesticide use.

Lemons are not often eaten on their own, they are more commonly sliced to accompany drinks, and the juice and rind can be used in cooking. They are included in the monitoring as part of the routine rolling programme of work.

This lemon survey considers residues in food and one substance, 2-phenylphenol, which is classified as a pesticide but is controlled under the *Miscellaneous Food Additives Regulations 1995 (S.I. 1995 No. 3187).* It does not have an MRL, but instead has a permitted limit (PL) expressed as mg/kg.

A number of new pesticides, such as from the strobilurin group e.g. azoxystrobin, have been sought for the first time.

Results June to December 2001

A total of 27 samples of lemons were tested for 42 pesticide residues. Samples of lemons were mainly from South Africa and Spain. Residues were found in 25 (93%) samples tested. The most prevalent residues were imazalil found in 93% of samples tested, 2-phenylphenol and 2,4-D both found in 48% of samples tested respectively. No MRLs or permitted limits were exceeded. Twenty-two samples were found to contain multiple residues, up to 6 in one sample. One of the samples tested was labelled as organic and did not contain any residues.

Previous survey results

Results January to May 2001

A total of 21 samples were tested, 20 (95%) were imported and 1 (5%) of unknown origin. The samples were mainly of Spanish origin. This survey included a number of pesticides not sought in the 1994 survey, most notably dicofol, as a suitable method of analysis was not previously available. No organic samples were tested. All of the samples tested contained residues.

Fifteen different pesticide residues were found, including a broad range of insecticides and fungicides. Nineteen (90%) of the samples contained multiple residues, including up to 9 different residues in one sample from Spain. Imazalil and dicofol were found together in 13 (62%) of 21 samples. Dicofol was found in 17 (81%) of the samples tested. Imazalil is a fungicide used to control various diseases and dicofol is a non-systemic organochlorine insecticide. Seventeen out of the 20 imported samples were tested for dithiocarbamates. No MRLs (or permitted levels in the case of pesticidal food additives) were exceeded. These results were published in the Q2 2001 report on the website (www.pesticides.gov.uk/committees/PRC/secondq2001/q2report2001.pdf).

Results 1994

Lemons were last sampled in 1994, for 38 pesticide residues. Residues were found in 22 (92 %) of the 24 samples tested. The samples originated from the following countries: 15 (63%) from Spain, 4 (17%) from Argentina, 1 (4%) each from Cyprus, Turkey and South Africa and 2 (8%) unknown samples. Sixteen (67%) of the samples contained multiple residues, up to 4. Ten different pesticide residues were found. Imazalil and 2-phenyl phenol were found in 16 and 11 samples respectively. No MRLs (or permitted levels in the case of pesticidal food additives) were exceeded.

Conclusion

These latest results show that 93% of the samples tested contained residues. The number of occurrences of residues is similar to the first part of the survey, although the residues profiles are somewhat different; the first half of the survey reported residues mainly of imazalil and dicofol, with the majority of samples being of Spanish origin; the second half of the year found residues of imazalil, 2-phenylphenol and 2,4-D, with the majority of samples being of South African origin.

Overall for 2001, there has been a slight increase in the number and occurrence of residues in lemons, compared to the 1994 survey, probably because dicofol was surveyed for the first time in 2001. There has also been an increase in multiple residues, which to some extent could be attributed to the testing for dicofol residues. However, none of the residues found occurred at levels which would give rise to concern for consumer health.

Lettuce EU (Table 7)

Introduction

Previous surveillance over a number of years has indicated some misuse of pesticides, particularly fungicides, on UK winter lettuce. The Pesticide Residues Committee has responded by commissioning annual surveys of samples collected from retail outlets. In addition, DEFRA has carried out enforcement programmes collecting samples directly from the premises of UK growers, for 6 years.

Two lettuce surveys were conducted during 2001; a retail survey and an enforcement survey. The retail survey sampled lettuces throughout the year and covered a wide range of residues. Whereas the enforcement survey targeted winter lettuce and mis-use of a limited range of problem residues.

Results 2001

A total of 180 samples of lettuces were tested for 45 pesticide residues. Samples of lettuces were mainly UK origin (65%) with 34% imported and 1% unknown origin. Residues were found in 54 (30%) samples tested. There were 2 (1%) MRL exceedances, which were also in UK produce. There were 4 non-approved uses, 3 of which were in the same sample which was labelled as UK origin. Azoxystrobin (MRL 0.05 mg/kg) was found in 1 sample at 0.9 mg/kg. Inorganic bromide (CAC MRL 100 mg/kg) was found in 1 sample at 164 mg/kg. Propyzamide (no MRL) was found in one sample at 0.02 mg/kg. Imazalil (no MRL) was found in one sample at 0.07 mg/kg. One sample labelled as UK origin, was found to contain 3 residues of pesticides which were not approved. It has been noted however that this lettuce was unlikely to be of UK origin, as the residues found and the type of lettuce involved were inconsistent with UK growing patterns and pesticide usage. The residues found were acephate (MRL 1 mg/kg) at 0.04 mg/kg; methamidophos (MRL 0.2 mg/kg) at 0.02 mg/kg; and procymidone (MRL 5 mg/kg) at 0.1 mg/kg. Risk assessments (see the section on 'Dietary intake implications' for full details) have shown that for inorganic bromide found at 164 mg/kg the safety margins built into the ARfD would be eroded, however adverse health effects would be unlikely. All other residues were not of concern for consumer health. None of the three samples tested that were labelled as organic contained residues. Seventeen (9%) of the samples contained multiple residues, up to 4 pesticides.

Previous survey results

Results 2000

Lettuces were last sampled in 2000. A total of 71 samples were analysed for 93 pesticide residues. Forty four (62%) of the samples were found to contain residues. Twenty-nine (41%) samples contained multiple residues. Non-approved uses of dimethoate, oxadixyl and pyrimethanil were observed. A total of 9 MRL exceedances were detected for various pesticides including inorganic bromide, dithiocarbamates, iprodione and propamocarb.

Conclusion

The latest survey shows that 30% of the samples tested contained residues. Two MRL exceedances (in UK produce) were observed. Three non-approved uses were found in one UK origin sample. Although none of the residues found were of concern for consumer health, we have written to the brand owners to inform them of these and will follow this up. It isn't appropriate to compare the results for this survey directly with the previous survey as a

much larger number of samples have been tested in the latest survey, but the list of residues has been reduced to target those of particular importance to lettuce. However, the results appear to suggest a slight improvement on the number of exceedances and non-approved uses since the last survey. There appears to be an improvement in methyl-bromide results in the samples tested compared with previous findings where there were 3 exceedances in 2000, and 8 in 1999. However, there continue to be exceedances of methyl bromide and therefore these results have been passed to PSD's Enforcement Branch.

Mushrooms (Table 8)

Introduction

This report covers mushrooms sampled during the whole of 2001, to cover the different sources and pesticide treatment regimes of mushrooms throughout the year. Different varieties of mushrooms were sampled, including chestnut, oyster and shiitake to reflect their increasing use and popularity.

Results 2001

A total of 155 samples of mushrooms were tested for 27 pesticide residues. Samples of mushrooms were mainly of UK origin (100 samples), with 48 imported and 7 samples of unknown origin. Residues were found in 14 (9%) samples tested. Chlormequat was found in 7 samples, gamma-HCH in 3 samples and prochloraz also in 3 samples. Gamma-HCH (no MRL) was found ranging from 0.08 to 0.1 mg/kg. Omethoate and dimethoate were found in the same sample at 0.2 mg/kg and <0.05 mg/kg, respectively. See the section on 'Dietary intake implications' for full details. However, there is no concern for consumer health from any of the residues found. One sample of mushrooms described as 'wild' contained chlormequat at 0.4 mg/kg exceeding the MRL for wild mushrooms of 0.05 mg/kg. Four samples of UK origin were found to contain non-approved pesticide residues. Three samples contained chlormequat (MRL 10 mg/kg [1]) as follows: 0.2 mg/kg in a sample of oyster mushrooms; 0.4 mg/kg in a sample of wild oyster mushrooms; and 0.6 mg/kg in a sample of shiitake mushrooms. A fourth sample of shiitake mushrooms was found to contain omethoate (MRL 0.2 mg/kg) at the MRL. Chlormequat is not approved for use on mushrooms in the UK, however there is literature to suggest that the type of mushrooms involved may be grown on nutrient bases of wood and straw. It is also possible that the mushroom spores might be stored in straw. Chlormequat is approved for use on cereals and it is possible that the straw, used to grow the mushrooms on or store the spores, legally contains residues of chlormequat which is absorbed by the spores or the mushrooms. Therefore, mushrooms grown from those spores or mushrooms grown on straw may contain residues of chlormequat below the MRL. In those circumstances, a non-approved use will not have occurred, as a pesticide has not been applied to the mushrooms. We have informed the brand owners for these samples and will be following this up. Four of the

[1] The sample containing 0.4 mg/kg was purchased before 1 July 2001, the date of the MRL of 10 mg/kg was implemented. Prior to this date, there was no MRL.

samples tested claimed to be organic, and one of these from Belgium contained residues of chlormequat at 0.2 mg/kg. We have informed UKROFs of this result. One sample contained 2 residues.

Previous survey results

Results 1998

Mushrooms were last surveyed in 1998, for 27 pesticide residues. Thirty-one samples were of UK origin, 5 samples were imported and 11 samples were of unknown origin. Residues were detected in 13 (28%) of the 47 samples tested. Carbendazim was found in 6 (13%) samples, gamma-HCH in 1 (2%) sample and prochloraz in 7 (15%) samples, all at levels below their respective MRLs. One sample contained 2 pesticides.

Conclusion

These latest results show that 9% of the mushrooms tested were found to contain residues. Whilst there were no MRL exceedances, there were 4 UK non-approved uses and one organic sample was found to contain residues. These incidents involved chlormequat and omethoate. It is thought that the chlormequat residues originated from straw used as a nutrient or to store the spores and therefore not from direct pesticidal use, therefore these may not be non-approved uses. It isn't appropriate to compare the results to the previous survey as a much larger number of mushrooms has been sampled this time compared to 1998. We have informed UKROFs of the result for chlormequat in a sample of Belgian mushrooms.

Potato (maincrop and new) (Table 9)

Introduction

Potatoes are monitored annually due to their importance as a staple component of a balanced diet. The potatoes sampled included Cara, Estima, Maris Piper, Marfona, Romano, Jersey Royal and Maris Peer amongst others. UK potatoes are available all year round, therefore this survey covers samples for the whole of 2001. This survey covers maincrop potatoes and new potatoes. Some of the MRLs are different for maincrop and new potatoes because of the harvest interval timing.

Results 2001

A total of 119 maincrop and 120 new crop samples of potatoes were tested for 26 pesticide residues. Samples of potatoes were originated as follows: UK maincrop (107), UK new (65), imported maincrop (8), imported new (50), unknown origin maincrop (4) and unknown origin new (5). Residues were found in 80 (33%) samples tested (50 maincrop, 30 new potatoes). Residues were split as follows: 63 UK, 14 imported and 3 unknown origin samples. Eighteen (8%) samples contained multiple residues, 14 maincrop and 4 new potato samples. Chlorpropham (no MRL) was found at levels ranging from

0.06 to 6.6 mg/kg. Oxadixyl (no MRL) was found at levels ranging from 0.02 to 0.2 mg/kg. Three (1%) samples contained MRL exceedances. Aldicarb (MRL 0.5 mg/kg) was found in 1 UK new potato sample at 0.6 mg/kg. Maleic hydrazide (MRL 1 mg/kg) was found in 1 sample of UK new potatoes at 5.8 mg/kg and 1 sample of imported new potatoes at 25 mg/kg. Risk assessments (see the section on 'Dietary intake implications' for full details) have shown that for chlorpropham, although the ARfD is exceeded, the risk to consumers is considered negligible once processing factors are taken into consideration. For aldicarb, the levels found would not be anticipated to significantly increase the level of exposure to consumers above that considered in the EU Review. There was no concern for consumer health from any of the other residues found. Other residues found below their respective MRLs were imazalil, tecnazene and thiabendazole. Eighteen samples contained multiple residues, 14 maincrop and 4 new potato samples. Thirteen (11 new and 2 maincrop) samples tested were labelled as to be organic. One of the samples of new potatoes claiming to be organic and originating from Israel contained oxadixyl at 0.03 mg/kg. We have informed UKROFs of this finding. None of the samples contained non-approved pesticide residues.

Previous survey results

Results 2000

Potatoes (maincrop) were last surveyed in 2000. 144 samples of potatoes were tested for a range of analytes associated with the production of potatoes. The majority of the samples were of UK origin (134), with 10 of unknown origin. Tecnazene was found in 9 (6%) of the UK samples. Chlorpropham, maleic hydrazide, thiabendazole, imazalil, aldicarb and oxadyxil were found in 36 (25%), 27 (19%), 5 (3%), 11 (8%), 1 (<1%) and 6 (4%) UK samples, respectively. The unknown origin samples contained 4 of the same residues found in the UK origin samples. One organic sample was tested which did not contain any residues. No MRLs were exceeded and no non-approved uses were found. These results were published in the Q4 2000 report on the website (www.pesticides.gov.uk/committees/PRC/2000_results.htm)

Conclusion

These latest results show that around 33% of the samples tested contained residues. This appears to be a slight improvement on the 2000 survey, where 48% of samples contained residues. Also, there is an improvement on the tecnazene findings, 2% in samples tested in 2001 compared with 6% of samples tested in 2000. The latest results reveal 3 MRL exceedances in 2 UK and 1 imported sample. However it is not appropriate to compare the results directly as this latest survey covers maincrop and new potatoes, and the 2000 survey covered only maincrop potatoes. The range and occurrence of the pesticide residues found are broadly similar to the previous survey. We have informed UKROFs of the oxadixyl residue in a sample of new potatoes.

Potatoes (maincrop and new) will be surveyed during 2002 and monitored closely for any reoccurrence of these findings.

Soft citrus (Table 10)

Introduction

Soft citrus is sampled as part of the rolling programme of surveillance. Different types of soft citrus were surveyed; satsumas, clementines, mandarins and tangarines. This survey covers samples collected during the main season from May onwards. Soft citrus are prone to various diseases and attack from insects. Therefore, they often have a rigorous pesticide regime to reduce problems such as *Penicillium*, which can rot the fruit. It is therefore not surprising to find multiple residues of various fungicides and insecticides on soft citrus.

Results May to December 2001

A total of 72 samples of soft citrus were tested for 51 pesticide residues. Samples of soft citrus were all imported mainly from Spain (44%) and South Africa (25%). All (100%) the samples tested contained residues. The most common residues found were as follows: imazalil (97% of samples), thiabendazole (53% of samples), 2,4-D (43% of samples), chlorpyrifos (35% of samples), 2-phenylphenol (33% of samples), methidathion (31% of samples) and malathion (26% of samples). Multiple residues were found as follows: 4 samples contained 1 residue; 15 samples contained 2 residues; 25 samples contained 3 residues; 12 samples contained 4 residues; 12 samples contained 5 residues; 3 samples contained 6 residues; and 1 sample contained 7 residues. One (1%) sample contained an MRL exceedance of imazalil (MRL 5 mg/kg) found at 6.5 mg/kg. Tetradifon (no MRL) was found in one sample at 0.1 mg/kg. The fact that the samples tested contain residues is not the concern. The concern is whether those residues are at a safe level. Risk assessments (see the section on 'Dietary intake implications' for full details) have shown that there is no concern for consumer health. One organic sample from Argentina was tested and found to contain residues of 2-phenylphenol (MRL 10 mg/kg) at 0.3 mg/kg and imazalil (MRL 5 mg/kg) at 0.1 mg/kg. The levels found are not of concern for consumer health, however we have notified the UK Register of Organic Foods (UKROFs) of this finding.

Previous survey results

Results 1993

Soft citrus was last sampled in 1993. A total of 90 samples were analysed for 34 pesticide residues. Residues were found in all (100%) the samples tested. Fifty eight samples contained multiple residues, up to a maximum of 4. Fifty one (57%) samples contained imazalil, 27 (30%) contained thiabendazole, 16 (18%) contained azinphos-methyl, 15 (17%) contained 2-phenylphenol and 13 (14%) contained chlorpyrifos. All these residues were below their respective MRLs. A range of other residues were found and all below their MRLs.

Conclusion

The latest surveys shows that all the samples tested contain residues, imazalil was the most common residue. Multiple residues, of up to 7 residues in one sample, were found in 94% of the samples tested. One sample contained an MRL exceedance of imazalil and one organic sample contained residues of 2-phenylphenol and imazalil. None of the residues found were of concern for consumer health. However, in view of the MRL exceedance, we have contacted the Argentinean authorities to notify them of this. We have notified UKROFs of the Argentinean organic sample which was found to contain residues.

Strawberries EU (Table 11)

Introduction

This survey was carried out as part of the co-ordinated EU programme. UK strawberries are available mainly between April to October, but imported varieties are available all year round from various countries, although the majority of the imported strawberries available in the UK are of Spanish origin. This is an annual survey and this report gives the results for the whole year. A number of recently approved pesticides for use on strawberries, such as fungicides from the strobilurin group, e.g. trifloxystrobin, have been sought for the first time.

Results 2001

A total of 179 samples of strawberries were tested for 42 pesticide residues in various combinations or suites (see footnote to Table 13). Half of the samples were UK origin and half were imported. Residues were found in 115 (64%) samples. There were 4 MRL exceedances and 2 'technical' UK non-approved uses. The MRL exceedances were as follows: dicofol (MRL 0.02 mg/kg[2]) was found at 0.2 mg/kg in 2 UK samples; kresoxim-methyl (MRL 0.05 mg/kg[3]) was found at 0.09 mg/kg in a UK sample; penconazole (CAC MRL 0.1 m/kg) was found in a sample from Israel at 0.2 mg/kg. The 2 UK dicofol MRL exceedances were also 'technical' non-approved uses because the approval for dicofol expired at the end of June, and the samples were purchased after this date and were found to contain residues of dicofol. However, it is likely that at the time the dicofol was applied to the strawberries it would have been approved for use. In addition, a number of residues were found with no MRLs: bupirimate found at 0.02 - 0.8 mg/kg; fenhexamid found at 0.05 - 4.3 mg/kg; pyrimethanil found at 0.02 - 0.9 mg/kg; cyprodinil found at 0.02 - 0.1 mg/kg; trifloxystrobin found at 0.06 mg/kg. Risk assessments (see the section on 'Dietary intake implications' for full details) have shown that none of the residues were of concern for consumer health. Seventy-eight (44%) samples were found to contain up to 6 multiple residues. Three of the samples tested were labelled as organic and did not contain any residues.

[2] A new EC MRL of 0.02 mg/kg for dicofol was implemented on 1 July 2001.
[3] An EC MRL of 0.05 mg/kg for kresoxim-methyl was implemented on 15 April 2001. No previous MRL.

Chlorothalonil was removed from this survey due to difficulties likely to have arisen as a result of processing at ambient temperature.

Previous survey results

Results 1999

In the survey of strawberries carried out in 1999, residues were detected in 36 (80%) of the 45 samples tested. Nineteen (42%) had multiple residues; one UK sample contained 5 individual pesticide residues. There were no MRL exceedances. The residues found most frequently were bupirimate, iprodione and pyrimethanil. This survey was the first time pyrimethanil was sought in strawberries. In addition residues of vinclozolin (indicating mis-use) were found in 1 sample of UK origin below the EU MRL of 5 mg/kg.

Conclusion

The latest survey shows that residues were found in 64% of samples tested. There were 4 MRL exceedances and 2 technical non-approved uses. These results suggest a slight improvement on the occurrence of residues in the samples tested, however, there appears to have been an increase in MRL exceedances. However, none of the residues found were of concern for consumer health.

Tomatoes (Table 12)

Introduction

Tomatoes are sampled as part of the rolling programme of surveillance of fruit and vegetables. Tomatoes are a popular commodity and can be either grown in the UK or imported. Those grown in the UK are usually grown under cover (i.e. in glasshouses) and generally few pesticides are used, pest control is mainly through the use of biological control agents.

Results 2001

A total of 144 samples of tomatoes were tested for 111 pesticide residues. Samples of tomatoes were of UK (24%), imported (75%) and unknown origin (1%). Residues were found in 26 (18%) samples tested. Four (11% of UK samples tested) UK samples and 22 (20% of imported samples tested) imported samples contained residues. Azoxystrobin (MRL 2 mg/kg) was found in 1 UK sample and 2 imported samples lower than the MRL. Seven samples (mainly from Spain) contained 2 residues. One Spanish sample contained 6 pesticide residues. A number of pesticides were found which do not have any set MRLs. See the section on 'Dietary Intake Implications' for full details of these as follows: tetradifon found at 0.06 mg/kg; bifenthrin found ranging from 0.03 to 0.04 mg/kg; bupirimate found at 0.2 mg/kg; fenhexamid found at 0.2 mg/kg; furalaxyl found at 0.02 mg/kg; oxadixyl found ranging from 0.06 to 0.1 mg/kg; and pyrimethanil found ranging from 0.1 to 0.3 mg/kg. No MRLs were exceeded. There were no non-approved UK uses. Five of the samples tested were labelled as organic and did not contain any residues.

Previous survey results

Results 1998

In the survey of tomatoes carried out in 1998, residues were detected in 18 (38%) of the 48 samples analysed. A total of 107 pesticide residues were sought. Twenty one of the samples were of UK origin, with 20 imported samples and 7 of unknown origin. Residues were found in 18 (38%) of the samples tested. Multiple residues of 2 or 3 pesticides detected in 7 (15%) samples. No MRLs were exceeded. However one UK sample contained a residue of vinclozolin which indicated a non-approved use.

Conclusion

The latest survey shows that 18% of the tomato samples tested contained residues, with 6% containing multiple residues. The overall results suggest an improvement compared to the previous survey where 38% of the samples tested were found to contain residues with 15% containing multiple residues. There were no non-approved UK uses observed in this latest survey, compared to 1 UK non-approved use of vinclozolin in the 1998 survey.

Apples (EU survey) (Table 13)

Introduction

Imported and UK sourced apples are available all the year round, therefore this survey covers the whole of 2001. Apples are monitored yearly due to their importance in the diet, particularly for children.

Results 2001

A total of 252 samples of apples were tested for 101 pesticide residues. Samples of apples were of UK origin (25%), imported (74%) and unknown origin (1%). Residues were found in 68 (27%) samples tested. No MRLs were exceeded. The most common residues were as follows: diphenylamine (CAC MRL 5 mg/kg) was found in 29 samples ranging from 0.05 to 2.7 mg/kg; chlorpyrifos (MRL 0.5 mg/kg) was found in 17 samples ranging from 0.01 to 0.3 mg/kg; dithiocarbamates (CAC MRL 3 mg/kg) were found in 12 samples ranging from 0.05 to 0.3 mg/kg; thiabendazole (MRL 5 mg/kg) was found in 9 samples ranging from 0.2 to 0.7 mg/kg; dodine (CAC MRL 5 mg/kg) was found in 7 samples ranging from 0.05 to 0.3 mg/kg; and propargite (CAC MRL 5 mg/kg) was found in 7 samples ranging from 0.08 to 0.6 mg/kg. There were a number of residues found with no MRLs: bupirimate was found at 0.05 and 0.07 mg/kg; bromopropylate was found at 0.1 to 0.4 mg/kg; and parathion-methyl was found at 0.05 mg/kg. Risk assessments (see the section on 'Dietary intake implications') have shown that there is no risk to consumer health from the residues found. There were no non-approved UK uses. Four samples were labelled as organic and none were found to contain residues.

Twenty-nine (12%) samples contained multiple residues, up to 6 in one sample from New Zealand.

Previous survey results

Results 2000

A total of 144 (36 (25%) UK, 105 (73%) imported and 3 (2%) unknown origin) samples were analysed for a total of 58 different pesticide residues associated with the production of apples. For the UK samples, the most common residues found were chlorpyrifos, carbendazim and pirimicarb. In imported samples, the most common residues found were carbendazim, chlorpyrifos, dithiocarbamates, dodine and phosalone. Of the samples tested, residues were found in 104 (72%), with 50 (35%) containing multiple residues (up to 3 pesticides). No MRLs were exceeded.

Conclusions

This latest survey reveals that residues were found in 27% of samples tested. It isn't appropriate to compare the results to the previous survey as the residue matrices sought were different. There were no non-approved UK uses. Twelve percent of samples contained multiple residues, up to 6. (Refer to page 5 regarding update on WiGRAMP). However, none of the residues found were of concern for consumer health.

Courgettes (Table 14)

Introduction

Courgettes have been surveyed as part of the rolling programme of fruit and vegetable surveys.

Results 2001

A total of 73 samples were tested for 93 pesticide residues. Samples of courgettes were of UK origin (40%), imported (53%) and unknown origin (7%). None of the UK origin or unknown origin samples contained residues. Three (4%) of the Spanish imported samples contained residues, up to 2 multiple residues in 2 (3%) samples. One sample contained buprofezin (no MRL) at 0.07 mg/kg. Two samples contained iprodione (MRL 2 mg/kg) at 0.07 and 0.1 mg/kg. Two samples contained oxamyl (no MRL) both at 0.1 mg/kg. Risk assessments (see 'Dietary intake implications' section) have shown that there is no concern for consumer health from any of the residues found. No MRLs were exceeded. There were no non-approved UK uses. Three of the samples tested were labelled as organic and did not contain any residues.

Previous survey results

Results 1992

Courgettes were last sampled in 1992. A total of 23 courgettes, 10 UK origin and 13 imported, were tested for 19 pesticide residues. None of the samples tested were found to contain residues.

Conclusions

This latest survey shows that low levels of buprofezin, iprodione and oxamyl were found in 3 samples of courgettes. None of the results were of concern for consumer health. Two samples contained 2 residues. (Refer to page 5 regarding update on WiGRAMP). It is not appropriate to compare these results with the previous survey as the number of courgettes tested, and the range of pesticide residues sought are significantly higher in this latest survey.

Marrow (Table 15)

Introduction

Marrows are sampled as part of the rolling programme of fruit and vegetables.

Results 2001

A total of 59 samples of marrows were tested for 83 pesticide residues. Thirty-two (54%) of the samples were of UK origin, 26 (44%) were imported and 1 (2%) of unknown origin. None of the samples tested were found to contain residues. None of the samples tested were labelled as organic.

Previous survey results

Results 1994

Marrows were last sampled in 1994. A total of 26 samples, 15 (58%) UK produced, 10 (38%) imported and 1 (4%) of unknown origin, were tested for 18 pesticide residues. None of the samples were found to contain residues.

Conclusions

The latest survey results for marrows shows that none of the samples tested contained any residues. These findings are consistent with previous survey results.

TROPICAL FRUIT AND VEGETABLE SURVEYS

Background

It has been observed that individual surveys of tropical foods, such as yams, starfruit and mangoes often reveal high numbers of residue results in exceedance of their EU MRLs. It is important to understand the wider problems facing growers and exporters of tropical foods, and to realise why

this should be the case, before this issue can begin to be addressed. Often tropical foods are imported from developing countries. The MRLs for certain important pesticides used on tropical foods may have been set at the 'limit of determination' (LOD). The LOD is the lowest concentration of a pesticide residue or contaminant that can be identified and quantitatively measured in a specified food, agricultural commodity or animal feed with an acceptable degree of certainty by the method of analysis. LOD MRLs arise, not because of safety reasons of that pesticide residue on that crop, but because there has been no commercial support to conduct the necessary experimental trials to establish an MRL on tropical fruit and vegetables. In recognition of this problem, the European Commission is establishing an aid programme for ACP (Africa –Caribbean –Pacific) countries which in the longer term should help to address this issue.

Star fruit (carambolas) (Table 16)

Introduction

This is the first year that star fruits (carambolas) have been sampled. The PRC have included this tropical fruit in the surveillance programme due to their increasing popularity with UK consumers (used in fruit salad dishes) and wider availability.

This report covers the results from the second part of the survey.

Results September to December 2001

A total of 29 samples of star fruit were tested for 84 pesticide residues in various combinations or suites (see footnote to Table 3). Twenty-five (86%) were imported from Malaysia, 4 of unknown origin. Five (17%) samples were found to contain residues. Three (10%) samples were found to contain residues exceeding their MRLs. Chlorpyrifos (MRL 0.05 mg/kg) was found in 2 imported samples and one unknown origin sample all at 0.08 mg/kg. A risk assessment (see the section on 'Dietary intake implications' for full details) has shown that none of the results were of concern for consumer health. None of the samples tested were labelled as organic and none of the samples contained multiple residues.

Previous survey results

Results April to August 2001

A total of 25 samples of star fruit were tested for 84 pesticide residues in various combinations or suites. Nearly all of the 25 samples were imported from Malaysia (92%), except for 2 (8%) of unknown origin. Four (16%) of the Malaysian samples contained residues. Two samples contained chlorpyrifos above its MRL of 0.05 mg/kg at 0.06 and 0.09 mg/kg. One sample contained endosulfan at its MRL of 0.05 mg/kg, and another contained monocrotophos (no MRL) at 0.03 mg/kg. None of the residues found were of concern for consumer health. None of the samples contained multiple residues and none

of the samples tested were labelled as organic. The results were published on the PRC website:
(www.pesticides.gov.uk/committees/PRC/thirdq2001/q3report.pdf).

Conclusion

This is the first year that star fruit have been surveyed as part of the surveillance programme.

Three samples of star fruits, 2 Malaysian and one of unknown origin, were found to contain residues of chlorpyrifos above its MRL of 0.05 mg/kg, at 0.08 mg/kg. These findings are consistent with the first part of the survey. A risk assessment indicates that none of the residues found are considered to be a risk to consumer health, however, as these are MRL exceedances we have written to the Malaysian authorities notifying them of these findings.

In total, for 2001, 54 samples of star fruits have been tested, with residues found in 9 (17%) samples. Five (9%) samples were found to contain residues of chlorpyrifos at levels above the MRL of 0.05 mg/kg. However, none of the residues found were considered to be a risk to consumer health.

Mango (Table 17)

Introduction

Mangoes have been included in the surveillance programme this year as part of the rolling programme and also because they have increased in popularity with UK consumers and their availability in recent years. This report provides the results of the second part of the survey.

Results August to December 2001

A total of 36 samples of mangoes were tested for 90 pesticide residues in various combinations or suites (see footnote to Table 4). Thirty-three (92%) of the samples were imported, 3 samples were of unknown origin. The majority of the samples were from Brazil (24), with 8 from Israel and 1 from Puerto Rico. Thirteen (36%) samples were found to contain residues, 12 of which were from Brazil and one of unknown origin. There was one (3%) MRL exceedance. One sample from Brazil was found to contain azoxystrobin (MRL 0.05 mg/kg) at 0.06 mg/kg. Azoxystrobin is a new strobilurin fungicide. One sample from Brazil was found to contain 2 residues, omethoate (no MRL) at 0.02 mg/kg and thiabendazole (MRL 5 mg/kg) at 0.4 mg/kg. Risk assessments (see the section on 'Dietary intake implications' for full details) have shown that none of the residues found were of concern for consumer health. However, given the MRL exceedance, we have contacted the authorities in Brazil to notify them of this finding. None of the samples tested were labelled as organic.

Previous results

Results May to August 2001

A total of 36 samples of mango were tested for 91 pesticide residues in various combinations or suites. Thirty-five (97%) of the samples were imported, 1 sample was of unknown origin. The majority of samples were from Puerto Rico (33%), with the remaining samples from other countries such as Brazil, Colombia and Venezuela. Three (8%) samples were found to contain residues. The first sample (from Puerto Rico) contained carbendazim (MRL 0.1 mg/kg) at 0.3 mg/kg. The second sample (from Brazil) contained two residues: azoxystrobin (MRL 0.05 mg/kg) at 0.1 mg/kg and carbendazim at the MRL of 0.1 mg/kg. The third sample, also from Puerto Rico, contained three residues, namely, carbendazim at its MRL of 0.1 mg/kg; dithiocarbamates (MRL 0.05 mg/kg) at 0.09 mg/kg, and tebuconazole (no MRL) at 0.6 mg/kg. Risk assessments have shown that none of the three MRL exceedances, or the residue with no MRL, were of concern for consumer health, however, given that MRLs have been exceeded, we have contacted the authorities in Brazil and Puerto Rico to notify them of these findings. Two samples were labelled as organic and did not contain any residues.

Previous results

Mangoes were last sampled in 1992. A total of 17 samples were analysed for 5 different pesticide residues; DDT, gamma-HCH, iprodione, malathion and omethoate. No residues were found. Fifteen of the samples were imported and 2 were of unknown origin. The samples were imported as follows: Brazil (3), Guatemala (2), Israel (1), Puerto Rico (4), South Africa (3) and Venezuela (2).

Conclusion

The results from this survey reveal 1 (3%) MRL exceedance. There appears to be an increase in the number of samples containing residues compared to the first half of the survey, probably reflecting the different sources of mangoes throughout the year. No residues were found at levels which would give rise to consumer health concerns, however, we have written to the authorities in Brazil notifying them of the MRL exceedance.

It is not appropriate to compare the results from this 2001 survey with the results for the previous survey carried out in 1992 as the number of samples analysed and the number of analytes sought have increased.

ANIMAL PRODUCT SURVEYS

Cow's Milk (Table 18)

Introduction

In 1995, samples of cow's milk were found to contain higher than expected residues of gamma-HCH (lindane), at levels up to 0.03 mg/kg. Following this, cow's milk has been monitored on a regular basis. Residues of gamma-HCH in samples tested appear to have fallen since 1995. No residues of gamma-HCH were detected over the past 4 years, until that found in the quarter 2 results of 2001, when low levels, below the MRL, were found in 4 samples. We have continued to closely monitor cow's milk for any recurrence of the results in 1995.

Whole cow's milk and partially skimmed cow's milk were analysed in this survey, to see whether there is any difference in the levels of organochlorine residues found due to differences in the fat content in the cow's milk and because semi-skimmed cow's milk is now more important in the diet, in particular for adults. Organochlorine residues are highly fat-soluble, therefore it could be expected that whole milk would contain the higher residues.

Results October to December 2001

A total of 59 samples of milk (55 UK origin, 4 unknown origin) purchased between October and December 2001 were tested for 18 pesticide residues. No residues were found in any of the samples tested. Eight of the samples were labelled as organic.

Previous results

Results July to September 2001

A total of 51 samples of milk (49 UK origin, 2 unknown origin) purchased between July and September were tested for 18 pesticide residues and reported in the Quarter 3 report for 2001 (www.pesticides.gov.uk/committees/PRC/thirdq2001/q3report.pdf). No residues were found in any of the samples tested. Eight of the samples were labelled as organic.

Results April to June 2001

A total of 53 samples (50 UK origin, 3 unknown origin) were tested during April to June 2001 and reported in the Quarter 2 report for 2001 (www.pesticides.gov.uk/committees/PRC/secondq2001/q2report2001.pdf). Eighteen pesticide residues were sought. Residues of gamma-HCH were found in 4 (8%) of the UK origin samples. The levels found ranged from 0.0006 – 0.003 mg/kg (MRL 0.008 mg/kg). Two of the samples, containing gamma-HCH, were purchased in April and two in May. None of the June samples tested contained gamma-HCH. Three of the samples tested were

organic and none of them contained any residues. Risk assessments have shown that none of residues of gamma-HCH gave concern for consumer health.

Results January to March 2001

A total of 54 samples (47 UK origin, 7 unknown origin) were tested during January to March 2001 and reported in the Quarter 1 report for 2001 (www.pesticides.gov.uk/committees/PRC/firstq2001/q1rep-01.pdf). A total of 18 pesticide residues were sought, including gamma-HCH. No residues were found in any of the samples tested. Seven of the samples tested were organic.

Conclusion

Samples of milk are collected throughout the year and the results are reported in each of the respective quarterly reports. This quarter results show an improvement in residues of gamma-HCH. No residues were found compared to 4 samples of wholemilk purchased in April and May and reported in Quarter 2.

Milk, as a dietary staple, is monitored each year. The first quarter results for 2002 will be reported in the first quarter 2002 report, expected in August.

Salmon – canned (Table 19)

Introduction

Salmon is a popular fish and is widely consumed. Although salmon have a relatively short life span, it is likely that they are exposed to residues from food and the environment. The canned salmon survey has been divided into two. This is an annual survey to reflect potentially different sources of salmon available on the market at different times. This report covers samples purchased between April and December.

This canned salmon survey should allow comparison with results for fresh salmon which was also sampled during 2001.

Results April to December 2001

A total of 108 samples of canned salmon were tested for 10 organochlorine pesticide residues. Three (3%) of the samples were UK origin and 105 (97%) were imported. The majority of the imported samples were from USA (96), with 6 from Canada and 1 each from Chile, France and Korea. Twenty six (24%) of the samples tested were found to contain residues; all of these samples contained DDT (no MRL) at levels ranging from 0.004 to 0.01 mg/kg. One (1%) of the samples from USA also contained hexachlorobenzene (no MRL) at 0.002 mg/kg. Risk assessments (see the section on 'Dietary intake implications' for full details) have shown that none of the residues found were of concern for consumer health. None of the samples tested were labelled as

organic. One sample contained 2 residues. Toxaphene was removed from the survey as it proved to be extremely difficult to analyse.

Previous survey results

Results January to April 2001

A total of 48 imported samples of canned salmon were tested for 10 organochlorine pesticides. None of the samples tested were organic. Residues of DDT (in the form of *p,p'*-DDE and *p,p'*-TDE) were found in 12 (25 %) samples. One of these samples also contained hexachlorobenzene. These results were published in the quarter 2 2001 report http://www.pesticides.gov.uk/committees/PRC/secondq2001/q2report2001.pdf

Results 1993

Canned salmon was last tested in 1993. A total of 36 samples were tested, 26 (72%) imported and 10 (28%) of unknown origin. Residues of DDT, hexachlorobenzene, alpha-HCH, beta-HCH and gamma-HCH were found. The most common residues found were of DDT (found in 26 (72%) samples) and alpha-HCH (found in 11 (31%) samples). Multiple residues were found in 14 (39%) samples tested, up to 5 multiple residues.

Conclusion

Residues were found in 24% of canned samples, however, these were all at levels which would not give rise to consumer concern. Overall for 2001, a total of 156 samples of salmon were tested. Residues were found in 38 (24%) of the samples tested. Residues in this survey of canned salmon compared to the previous 1993 survey of canned salmon suggest an improvement in the frequency of occurrence of organochlorine residues. Also, generally, residues in canned salmon seem to be fewer in frequency and occurrence compared to fresh salmon.

Salmon – fresh (Table 20)

Introduction

Salmon is a popular fish and is widely consumed. Although salmon have a relatively short life span, it is likely that they are exposed to residues from food and the environment. This is an annual survey to reflect potentially different sources of salmon available on the market at different times.

Results January to December 2001

A total of 73 samples of fresh salmon were tested for 10 organochlorine pesticides. Residues were found in 71 (97%) of the samples tested. Samples originated as follows: 60 were of UK origin. 1 imported sample and 12 of unknown origin. Residues of chlordane, DDT and hexachlorobenzene were found; chlordane (no MRL) was found in 13 (%) samples ranging from 0.002

to 0.006 mg/kg; DDT (no MRL) was found in 71 (%) samples ranging from 0.003 to 0.04 mg/kg; hexachlorobenzene (no MRL) was found in 31 (42%) samples ranging from 0.002 to 0.003 mg/kg. See the section on 'Dietary intake implications' for full details of the risk assessments. However, none of the residues found were of concern for consumer health. Two organic samples were tested and were found to contain residues of DDT and hexachlorobenzene in one of them, and DDT in the other one. UKROFs have been informed of these results. However, it is of note that the residues found at these low levels are likely to be due to contamination by environmentally persistent compounds. The residues found in the fresh salmon are associated with the fat content of the fresh salmon. The Centre for Environment, Fisheries and Aquaculture Science (CEFAS) were asked to comment on these findings, and they note that the residue profile and the concentrations of the residues found are expected and not surprising. Contamination may arise from contaminated pelleted feed. Farmed salmon are reared on feed that is high in fish oils derived from a variety of sources e.g. capelin, sardine, herring, pilchard. The organochlorine content of the feed pellets would vary from batch to batch depending on the source of the fish oils and meal, but the feed can contain considerable levels. Thirty two (44%) samples were found to contain multiple residues, of up to 3.

Previous survey results

Results 1997

A total of 14 samples of fresh farmed salmon were taken in 1997 and tested for 9 organochlorine pesticides. Chlordane, gamma-HCH, DDT, hexachlorobenzene and dieldrin residues were found. All (100 %) of the samples of salmon contained one or more residue, up to 4 multiple residues. All the samples were of UK origin.

Conclusion

These latest results are comparable to the previous findings of residues in fresh salmon, however it is of note that gamma-HCH and dieldrin were not found in the latest survey. Comparing the fresh salmon results to the canned salmon results, the fresh salmon appear to have a higher occurrence of residues compared to canned salmon. This may be due to the fact that fresh salmon contain a high fat content associated with organochlorine residues, whereas this is fat portion is probably removed during the cooking and processing of salmon intended for canning. None of the results from this latest survey are of concern for consumer health. There were 2 organic samples containing residues. UKROFs have been informed of this result, although it is noted that it is likely to be caused by contamination from environmentally persistent compounds.

Eggs (Table 21)

Introduction

Eggs have been included in the 2001 survey as part of the rolling programme. Residues are not expected, except for DDT, which may be present as an environmental contaminant.

Results 2001

A total of 72 samples of eggs were tested for 9 organochlorine pesticide residues. All of the samples were of UK origin. None of the samples tested contained residues. Seven of the samples were labelled as organic.

Previous survey results

Results 1997

Seventy-two samples of eggs were analysed for 10 pesticide residues. One (1%) sample contained a residue of *p,p*-DDE (DDT), well within the MRL.

Conclusions

These latest results show that none of the samples of eggs tested contained any of the organochlorine pesticide residues sought. These results are consistent with previous findings, and a slight improvement on the 1997 survey when one sample was found to contain residues of the environmental contaminant, DDT.

Yoghurt/fromage frais (Table 22)

Introduction

Yoghurt has been included in the 2001 survey as part of the rolling programme. This is the first time that fromage frais has been surveyed; it has been included in recognition of its increasing popularity particularly amongst children. However, only a small number of fromage frais samples have been included, proportionate to the yoghurt:fromage frais market. When yoghurt was last sampled in 1997, no residues were found, and it was suggested that this might be related to the low fat content of the samples.

Results 2001

A total of 13 samples of fromage frais and 107 samples of yoghurt were tested in this survey. Half of the samples were tested for all 37 pesticide residues, and half were tested for 10 organochlorine pesticides only (see footnote to table 22). None of the samples tested were found to contain residues. None of the fromage frais samples were labelled as organic. Eleven of the yoghurt samples were labelled as organic. Many of the samples were labelled as ‘fat free’ or ‘low fat’.

Previous survey results

Results 1997

Thirty-six samples of yoghurt, 25 UK origin and 11 imported, were sampled for 10 organochlorine pesticide residues. None of the samples tested were found to contain residues.

Conclusions

This latest survey of yoghurt and fromage frais shows that none of the samples tested contained pesticide residues. The yoghurt findings are consistent with those found previously.

CEREAL/CEREAL PRODUCTS

Bread – ordinary (Table 23)

Introduction

Bread is monitored annually due to its importance as a staple component of a balanced diet. This survey covers ordinary bread, such as brown, white, multigrain and wholemeal. Savoury breads, such as cheese or garlic bread have also been sampled during 2001 and the results are reported below.

Results January to December 2001

A total of 144 samples of ordinary bread were tested for 18 pesticide residues. Residues were found in 55 (38%) samples tested. Three residues were found; chlormequat, pirimiphos-methyl (15 samples) and glyphosate (9 samples). Chlormequat (no MRL) was found in 32 (22%) samples ranging from 0.05 to 0.2 mg/kg. Pirimiphos-methyl (CAC MRL 1.0 mg/kg wholemeal bread, 0.5 mg/kg white bread) was found in 15 (10%) samples ranging from 0.05 to 0.1 mg/kg. Glyphosate (no MRL) was found in 9 (6%) samples ranging from 0.1 to 0.2 mg/kg. Comparisons with MRLs for the raw commodities have been made (see the section on 'Dietary intake implications', Table E, for full details). None of the residues found were of concern for consumer health. No MRLs were exceeded. One sample contained 2 residues. Four of the samples tested were labelled as organic and none contained any residues.

Previous survey results

Results 2000

In the 2000 survey, 216 samples of ordinary bread were tested for a range of important analytes associated with the production of bread. Two (1%) of the

samples were of unknown origin, the remaining 214 samples were of UK origin (99%). The types of bread was split between white (60%), brown (13%), wholemeal (21%) and multigrain (6%). Of the samples tested, 96 (44%) contained residues, 15 (7%) contained multiple residues (up to 3 pesticides).

Chlormequat (a plant growth regulator) was the most prevalent residue found in 88 (41%) samples tested (25 (20%) white, 19 (66%) brown, 33 (75%) wholemeal, 11 (85%) multigrain), ranging from 0.05 to 0.2 mg/kg. Seven (3%) samples contained pirimiphos-methyl between 0.07 to 0.2 mg/kg and 16 samples (7%) contained glyphosate between 0.1 to 0.3 mg/kg. Malathion was found in 1 sample. Although malathion is not approved for use on wheat in the UK, the residue may have resulted from imported flour being used in this sample. Two organic samples were tested and neither contained residues. No MRLs were exceeded. These results were published in the Q4 2000 report on the website:
www.pesticides.gov.uk/committees/PRC/fourthq2000/q4rep-00.pdf

Conclusion

These latest results show that 38% of the samples tested contained pesticide residues. This is the second survey where both chlormequat and glyphosate have been sought. The results are comparable to the 2000 survey, suggesting a slight improvement on the percentage of samples found to contain residues and the occurrence of multiple residues. No MRLs were exceeded and none of the residues found were of concern for consumer health.

Bread – savoury (Table 24)

Introduction

Bread is monitored annually due to its importance as a staple component of a balanced diet. This is the first time that savoury bread has been sampled. Varieties sampled included garlic, cheese, onion, tomato, olive oil and potato bread. Speciality bread has been surveyed previously in 1999, and included samples of naan, ciabatta, focaccia, pitta, brioche and soda bread.

Results 2001

A total of 72 samples of UK manufactured samples of savoury bread were tested for 18 different pesticides in a range of analytical suites (see footnote to Table 19). Six (8%) of the samples tested contained residues. Four (6%) samples contained chlormequat (no MRL) at 0.05 to 0.09 mg/kg. Two (3%) of the samples contained glyphosate (no MRL) at 0.1 and 0.2 mg/kg. One (1%) sample was found to contain pirimiphos-methyl (no MRL) at 0.07 mg/kg. The residues found are likely to have originated from the wheat (flour) component of the bread. Chlormequat is a growth regulator approved for use on cereals. Glyphosate is used as a desiccant on cereal crops before harvesting. Pirimiphos-methyl is an organophosphorus insecticide used to control a

variety of pests in stored grain. Comparisons with MRLs for the raw commodities have been made (see the section on 'Dietary intake implications', Table E, for full details). All of the residues were consistent with those for the raw products and none were of concern for consumer health. One sample contained 2 residues[4]. One of the samples tested was labelled as organic and did not contain any residues.

Previous survey results

This is the first time that savoury bread has been looked at as part of the surveillance programme therefore there are no previous results for comparison.

Conclusion

Residues were found in 8% of the samples tested, all at low levels which were not of concern for consumer health. There were generally fewer residues of glyphosate and pirimiphos-methyl compared to ordinary bread (see Table 18). This may be due to the fact that ordinary bread samples include wholemeal varieties made from wholemeal flour which usually contain a higher occurrence of residues compared to white bread made from white flour. Savoury bread is also usually made from white flour, and therefore it is not unexpected that there is a low occurrence of residues.

Bran (Table 25)

Introduction

Bran is recognised as an important aspect of a healthy diet, to add fibre to a diet. This is the first time that chlormequat and glyphosate have been sought since methods have been developed for them in bran since the previous survey in 1992.

Results January to December 2001

A total of 47 samples of bran were tested for 21 pesticide residues. Samples of bran were all of UK origin. Residues were found in 40 (85%) samples tested. Chlormequat (no MRL) was found in 40 (85%) samples ranging from 0.2 to 6.3 mg/kg. Etrimfos (no MRL) was found in 2 (4%) samples at 0.06 mg/kg and 0.2 mg/kg. Glyphosate (no MRL) was found in 34 samples ranging from 0.1 mg/kg to 1.8 mg/kg. Pirimiphos-methyl (no MRL) was found in 21 samples ranging from 0.06 mg/kg to 1.5 mg/kg. Risk assessments have been carried out (see the section on 'Dietary intake implications' for full details). None of the residues found were of concern for consumer health. Forty-one samples were found to contain up to 4 multiple residues. Five of the samples tested were labelled as organic and did not contain any residues.

[4] Due to the analytical suite combinations, the samples found to contain residues were not tested for all the residues sought, therefore it is not possible to comment on multiple residues in these samples.

Previous survey results

1992

A total of 46 samples of bran, all of UK origin were tested for 25 pesticide residues. Residues were found in 30 (65%) of the samples tested. Pirimiphos-methyl was the most common residue, found in 30 samples. Samples were found to contain up to 3 multiple residues.

Conclusion

These latest results show that residues were found in 85% of samples tested. This is an apparent increase, compared to the previous survey, however, it is of note that neither chlormequat or glyphosate were sought in the previous survey. Both of these residues were found at a high incident rate but at low levels in this latest survey. However, none of the results were of concern for consumer health.

MISCELLANEOUS SURVEYS

Tea (Table 26)

Introduction

In the past, tea has proven a difficult commodity to analyse and the results of the 1995 survey indicate that analytical problems may have influenced the frequency and number of residues found. This survey looks at different brands of tea, the majority of which are 'blended' i.e. from more than one source. This is the second part of the survey for 2001.

Results (September to October 2001)

A total of 48 samples of tea were tested, 2 imported and 46 of unknown origin (probably a blend of several sources of tea). A total of 27 pesticide residues were sought. Five (10%) samples were found to contain residues. Dicofol (MRL 20 mg/kg) was found in 5 (10%) samples ranging from 0.06 to 0.1 mg/kg. Ethion (MRL 2 mg/kg) was found in 3 (6%) samples at 0.1 to 0.2 mg/kg). Dicofol is an organochlorine acaricide used to control many species of phytophagus mite and ethion is an organophosphorus acaricide and insecticide, used to control a range of insect pests including spider mites, aphids and thrips. Residues of dicofol and ethion were found in 3 samples. One organic sample was tested and did not contain any residues. No MRLs were exceeded.

Previous survey results

Results (August to September 2001)

A total of 48 samples of tea were tested, 4 imported and 44 of unknown origin. A total of 27 pesticide residues were sought. Seven (15%) samples were found to contain residues. Dicofol (MRL 20 mg/kg) was found in 6 (13%) samples ranging from 0.06 to 0.3 mg/kg. Ethion (MRL 2 mg/kg) was found in 2 (4%) samples at 0.08 and 0.1 mg/kg. Residues of both dicofol and ethion were found in one sample originating from India. Three organic samples were tested and did not contain any residues. No MRLs were exceeded. These results were reported in the Q3 2001 report on the website (www.pesticides.gov.uk/committees/PRC/thirdq2001/q3report.pdf).

Results (1995)

A survey of 59 retail brands of tea were tested in 1995. Residues were found in 10 (17%) of the samples. Residues of dicofol ranging from 0.06 to 0.6 mg/kg were found in 8 samples and residues of ethion ranging from 0.1 to 0.9 mg/kg were found in 5 samples. None of the residues found exceeded an MRL. Three samples contained 2 multiple residues.

Conclusion

The residues profiles for the results from September to October 2001 are very similar to those for August to September 2001. In this survey, no MRLs were exceeded and none of the residues found were of concern for consumer health. Overall for 2001, a total of 96 samples were tested, and 12 (13%) samples were found to contain residues at levels well below their respective MRLs. The residues profiles were comparable to those found in the 1995 survey.

Pizza (Table 27)

Introduction

This is the first year that pizzas have been tested. However the main ingredients such as flour, tomatoes and cheese, have all been surveyed previously. Pizzas are being tested because they are particularly popular amongst children and can form a significant part of today's diet. As pizza is a processed commodity it would be expected that there would be little or no residues. This is the second part of the survey. The first half of the results were reported in Q3 of 2001. These quarter 4 results for pizzas include results from retail outlets and takeaway/delivery pizza outlets.

Results September to December 2001

A total of 24 samples of pizza were tested for 38 different pesticide residues. Twenty two of the samples were UK manufactured, 1 sample was imported and 1 sample was of unknown origin. Residues were found in 2 (8%) samples; two samples of pizzas were found to contain residues of chlormequat (no MRL), both at 0.06 mg/kg. Durum wheat is the main type of wheat used to make flour for pizza bases, and it is likely that these residues of chlormequat originated from the wheat component of the raw ingredients. Chlormequat is a growth regulator approved for use on cereals. Comparisons with MRLs for the raw commodities have been made (see the section on 'Dietary intake implications', Table E, for details). All of the residues found were consistent with MRLs for the raw product and none were of concern for consumer health. Glyphosate and fenbutatin oxide proved extremely difficult to analyse for and were removed from the survey. No organic samples were purchased.

Previous survey results

Results April to August 2001

A total of 24 samples of pizza were tested for 38 different pesticide residues. Twenty one of the samples were UK manufactured, and 3 were of unknown origin. No residues were found. Glyphosate proved extremely difficult to analyse, therefore it was removed from the survey. No organic samples were purchased.

Conclusion

This is the first year that pizzas have been sampled. In this quarter's results, 2 residues of chlormequat were found at low levels. None of the residues found were of concern for consumer health, including children whose consumption of this product/commodity is relatively high.

Processed potato products (Table 28)

Introduction

This survey covers a wide range of different potato products such as potato wedges, chips/fries, mashed potato. These types of processed potato products are very popular, particularly amongst children, and can form a significant part of their diet. This is the second part of this 2001 survey.

Results October to December 2001

A total of 84 samples of processed potato products were tested, 52 UK origin, 6 imported and 26 samples of unknown origin. A total of 14 pesticide residues were sought. Twenty two (26%) samples were found to contain residues. Maleic hydrazide (no MRL) was found in 15 (18%) samples ranging from 1.3 to 11 mg/kg. Chlorpropham (no MRL) was found in 6 (7%) samples ranging from 0.3 to 1.5 mg/kg. Thiabendazole (no MRL) was found in 3 (4%) samples ranging from 0.007 to 0.4 mg/kg. Oxadixyl (no MRL) was found in 1 sample at 0.03 mg/kg. Maleic hydrazide and chlorpropham are both approved for use as sprout suppressants on potatoes. Oxadixyl and thiabendazole are both fungicides approved for use on potatoes. Comparisons with MRLs for the raw commodities have been made (see the section on 'Dietary Intake Implications', Table E, for full details.) All of the residues found were consistent with MRLs for the whole raw potatoes and none were of concern for consumer health. One sample contained 2 residues, and a further sample contained 3 residues. Five of the samples tested were labelled as organic and did not contain any residues.

Previous survey results

Results January to March 2001

A total of 48 samples were analysed, 25 UK, 11 imported and 12 of unknown origin. Twelve (25%) of the samples tested contained residues. A range of pesticide residues commonly associated with potato production were sought, 30 altogether. Chlorpropham, maleic hydrazide and oxadixyl were the only pesticide residues found. Three UK, 2 imported and 1 unknown sample contained chlorpropham at levels 0.1 to 0.2 mg/kg. Maleic hydrazide was found in 4 UK samples at 2.4 to 8.4 mg/kg. Chlorpropham and maleic hydrazide are applied post harvest to suppress sprout production and residues are commonly found. Oxadixyl was found in 3 UK and 1 unknown sample at 0.02 mg/kg. Oxadixyl is a fungicide used to control potato blight.

Three UK samples contained multiple residues (maximum of 2). No organic samples were tested. These results were reported in the quarter 1 2001 survey published on the website:
(http://www.pesticides.gov.uk/committees/PRC/firstq2001/q1rep-01.pdf).

Results 1998

A processed potato survey was carried out in 1998. Pesticide residues were found in 58 (60%) of the 97 samples with multiple residues of up to three different residues present in 29 (30%) of the samples. Chlorpropham, propham, maleic hydrazide and tecnazene were the pesticide residues found.

Conclusion

The range of residues found in this second part of the 2001 survey are comparable to those found in the first part reported in quarter 1 2001. In this latest part of the survey, 26% of the samples tested were found to contain residues. It is likely that many of the potatoes were stored and treated prior to processing, therefore it is not unexpected to find residues of storage products such as maleic hydrazide. The residues were at low levels, and comparable to those found in the raw commodity. None of the residues found were of concern for consumer health.

For 2001, in total 132 samples were tested, 34 (26%) were found to contain residues. The range of pesticides found in this survey compared to the previous survey is similar, although it is noted that tecnazene was sought but not found in this latest survey. This is likely to be due to the fact that tecnazene will shortly be withdrawn for use on potatoes. There appears to be a reduction in the number of samples found to contain residues in this 2001 survey (26% containing residues) compared to the previous 1998 survey (60% containing residues.

Infant food (meat/fish/egg based) (Table 29)

Background

This is the first year that egg or fish based infant foods have been looked at, although meat based infant foods have been reported on previously. The new EC MRL of 0.01 mg/kg for all individual pesticide residues in baby food will come into force in 2002 and this survey will give a baseline for comparison for future surveillance of this type of infant food. A reporting limit of 0.01 mg/kg has been used for this survey to reflect this.

Results October to December 2001 (second part)

A total of 76 samples of infant food were tested for 54 pesticide residues. Forty-two (55%) samples were UK manufactured, 27 (36%) were imported and 7 (9%) were of unknown origin. Six (8%) samples were found to contain residues. Chlorpropham (no MRL) was found in 5 samples ranging from 0.02 to 0.03 mg/kg. Chlorpropham may be used on potatoes as a sprout

suppressant and all the samples found to contain this residue had potatoes as a major ingredient. One sample was found to contain ETU (no MRL) at 0.01 mg/kg. ETU is a degradation product of dithiocarbamate pesticides. Risk assessments (see 'Dietary intake implications' section) have shown that none of the residues found were of concern for infants. None of the samples contained multiple residues. Twenty-six samples labelled as organic were tested and none were found to contain any residues.

Previous survey results

Results January to March 2001 (first part)

A total of 68 samples were tested for 50 different pesticide residues. From the samples tested, 45 were UK manufactured, 22 imported and 1 of unknown origin. The only pesticide residue found was oxadixyl, in 2 (%) UK manufactured samples at 0.01 mg/kg. Twenty four samples tested were organic and none of these contained any residues. No MRLs were exceeded and no samples contained multiple residues.

Results 1998

No residues were found in the 48 samples tested. A total of 24 pesticide residues were sought.

Conclusions

These latest results for the second part of 2001 show that 8% of the samples tested contained residues, of either chlorpropham or ETU. It is of note that the residues found for chlorpropham would not comply with the incoming MRL that comes into force in 2002. However, none of the residues found were of concern for infant health.

In total for 2001, a larger sample of infant foods were analysed in this survey than previously. Fish and egg based products have been considered in this latest survey for the first time, therefore it is inappropriate to make comparisons between this and the previous survey.

Orange juice (Table 30)

Background

Some oranges are specifically grown for juicing, while others are grown for direct sale initially, but may subsequently be used for juicing if they fail marketing standards. From previous surveys, it has been apparent that residue occurrence in orange juice is lower than that of fresh oranges. This is not unexpected, as oranges produced specifically for juicing are unlikely to have to meet the same aesthetic standards as those for direct sale to the consumer. Thus, oranges would be expected to receive fewer pesticide treatments.

Results 2001

A total of 71 samples of orange juice were tested for 37 pesticide residues. None of the samples were found to contain any residues. Seven organic samples were tested.

Previous survey results

Orange juice was last sampled in 1997. The results are available at: www.pesticides.gov.uk/committees/WPPR/early_reports/wppr97a.pdf

Conclusions

It is not appropriate to compare the results of this survey with the previous survey as there are differences in reporting limits and the analytes sought. These latest results are encouraging, as no residues were found from those sought in the samples tested.

ORGANIC RESULTS

Organic Samples

Organic samples are not specifically targeted in the surveys. They are tested as part of the monitoring programme as they are available for consumers to buy.

The following organic samples were tested and reported in this quarterly report:

Commodity	Number of organic samples tested	Residues found from those sought*
Apples (EU survey)	4	0
Bran	5	0
Ordinary bread	4	0
Savoury bread	1	0
Celery	5	0
Courgette	3	0
Eggs	7	0
Grapefruit	0	0
Grapes (EU survey)	0	0
Grapes (special survey)	1	0
Infant food (meat/fish/egg base)	26	0
Lemons	1	0
Lettuce (EU survey)	3	0
Mango	0	0
Marrow	0	0
Cow's milk	8	0
Mushrooms	4	One sample contained chlormequat at 0.2 mg/kg
Orange juice	7	0
Peach	0	0
Nectarine	0	0
Pizza	0	0
Potatoes (maincrop & new)	13	One sample contained oxadixyl at 0.03 mg/kg
Processed potato products	5	0
Canned salmon	0	0
Fresh salmon	2	One sample contained DDT at 0.006 mg/kg, one sample contained DDT at 0.01 mg/kg and HCB at 0.003 mg/kg
Soft citrus	1	One sample contained 2-phenylphenol at 0.3 mg/kg and imazalil at 0.1 mg/kg
Starfruit	0	0
Strawberries (EU survey)	3	0
Tea	1	0
Tomatoes (EU survey)	5	0
Yoghurt/fromage frais	11	0

*Residues sought may include some of those pesticides approved for use on organically produced food. See individual commodity tables for details of analytes sought.

None of the residues found in organic samples were of concern for consumer health. We have notified the brand owners and passed details on to the UK Register of Organic Foods (UKROFs) for follow up.

DIETARY INTAKE IMPLICATIONS

1. BACKGROUND ON RISK ASSESSMENTS

General

Risk assessments are routinely carried out under the following circumstances:

(i) exceedance of EC, UK or CODEX MRL
(ii) evidence of a UK non-approved use
(iii) other selected cases where there might be expected to be consumer intake concerns. In these circumstances there may or may not be an MRL in place.

Most consumer intake concerns relate to short term exposure rather than chronic exposure. This is especially true of the PRC monitoring data where in most cases the majority of samples contain residues below the reporting limit. Short term risk assessments are a relatively new scientific development and therefore for MRLs which were set several years ago, short term risk assessments would not have been considered. Therefore for some pesticides which have 'old' MRLs, it cannot be assumed that residues below the MRL will result in acceptable intakes within the Acute Reference Dose (ARfD). Therefore, it is necessary to carry out risk assessments selectively where these concerns arise. Expert judgement is used to determine when a risk assessment is necessary, however, some of the triggers used to determine when a risk assessment is needed include:

- pesticides with a low acceptable daily intake (ADI) value and/or low ARfD value
- relatively high residues (usually residues at levels ≥ 50% of the MRL, where there is an MRL)
- residues found in commodities for which consumption is relatively high (especially for toddlers which are often the 'critical' group for intake estimates)
- and those commodities for which a 'variability' factor is applied in the short term risk assessment.

Processed commodities

The statutory controls for pesticide residues in food are contained in 'The Pesticides (Maximum Residue Levels in Crops, Food and Feeding Stuffs) (England and Wales) Regulations 1999' (as amended). This covers raw commodities but also processed, dried and composite foods. MRLs may be extended to these products but levels are not specifically laid down in legislation. They are derived by calculation on an individual product basis.

It is possible to compare the residue in the processed commodity with the MRL for the raw commodity and to make an approximation as to whether the residue found is likely to be within that for the raw commodity, taking into account its proportion in the processed commodity (detailed information on composition is not always known/given). However, this simplistic 'mass

balance' based approach is not always appropriate. It is possible for residues to concentrate in the processed commodity e.g. in oilseed rape a fat soluble pesticide may result in higher residues in the oil compared to residues in the raw seed. Such processing data are specific to individual pesticides and depend on the actual process and the physical chemical properties of the pesticide. In these cases a processing factor is applied to the MRL in order to back- calculate the estimated residue in the raw commodity, which is then compared with the MRL. Because various assumptions are made, the calculations are only estimates, but they can indicate where gross exceedance of MRLs occur.

In cases where residues would be expected to concentrate in a processed commodity and/or the intake estimate based on the raw commodity indicated intake at or above *ca* 10% of the ADI/ARfD, as part of the approval process PSD would receive processing data as part of the pesticide registration package so that the consumer risk assessments could be refined.

Consumption data are available for selected major processed commodities which are used to refine risk assessments e.g. boiled potatoes, crisps, fruit juice, sugar, bread and wine. Where such consumption data are not available, the intake estimates are based on the total consumption of the raw commodity which would represent the worst case. For example, breakfast cereals would be based on total cereal consumption data. In the case of mixed products, assumptions are made as to the likely origin(s) of the residues with reference to the food composition information. Intake estimates are then made based on the consumption data for the raw commodity (or commodities) to which the residue is most likely to relate. This represents a worst case. An example of this is iprodione in cereal bars. The most likely origin of this residue is the fruit rather than the cereals. Assuming the cereal bar contained raisins we could carry out a risk assessment based on total grape consumption (which would include raisin consumption).

2. RESULTS FOR THIS QUARTER

a. Risk assessments for samples containing residues above their MRL, or where there is no MRL

N.B. The consumer intake assessments focus on short term (acute) dietary exposure as being of most relevance and most critical in assessing the risk to consumers. Chronic risk assessments have been carried out on a case by case basis, but are not routinely reported.

Consumer exposure estimates have been compared to the most appropriate ARfD where available and relevant. Where a specific ARfD has not been readily available, short term exposure estimates have been compared to the ADI. Established independently peer reviewed toxicological end points have been used wherever possible. However some reference doses used have been determined by PSD and have not been independently peer reviewed and should be regarded as provisional.

Acute toxicology is not considered relevant for all pesticides. In terms of the pesticides that have been found in fruit and vegetables through the surveillance programme it would include tecnazene, maleic hydrazide, bitertanol, buprofezin, dicloran, diphenylamine, ethoxyquin, furalaxyl, imazalil, iprodione, kresoxim-methyl, myclobutanil, permethrin, pendimethalin, 2-phenylphenol, propargite, propyzamide, quintozene, thiabendazole, tolclofos-methyl and vinclozolin.

Long term (chronic) exposure assessments will have been routinely compared to ADIs when pesticide registration were issued, when MRLs were established and during any UK or EU reviews that have been carried out. Long term exposure assessments are carried out using median residue levels, rather than highest residues. Therefore long term risk assessments would only need to be carried out where the PRC data indicated a high proportion of samples contained residues above the MRL (would result in a higher median residue level than that previously assessed), or where there is no MRL *and* acute toxicology is not considered relevant for the particular pesticide concerned.

Grapes EU

One sample of grapes from Italy was found to contain 2 residues of dimethoate and omethoate at 0.08 and 0.07 mg/kg, respectively. Omethoate can occur as a residue of dimethoate.

i) Risk assessment for grapes (EU) – containing dimethoate (MRL 1 mg/kg) and omethoate (MRL 1 mg/kg) at 0.08 and 0.07 mg/kg, respectively

The estimated level of dimethoate in the sample of grapes has been calculated to be 0.64 mg/kg (dimethoate 0.08 mg/kg + omethoate 0.07 mg/kg x 8 (a conversion factor of x 8 is used to convert to dimethoate, because omethoate is 8 times more toxic than dimethoate.)

Acute risk:

An acute risk assessment for dimethoate shows that the short term intakes (worst case NESTI is for toddlers at 0.03 mg/kg bw/day) are at the ARfD of 0.03 mg/kg bw/day. As the intakes do not exceed the ARfD, the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:

There is no concern for consumer health.

Grapes (special survey)

Two samples of grapes were found to contain residues of chlorpyrifos at 0.6 and 1.4 mg/kg, in exceedance of the MRL. Parathion-methyl (no MRL) was found in 3 samples at 0.05 to 0.1 mg/kg. Risk assessments have been conducted on the highest levels found.

i) Risk assessment for grapes (special) – containing chlorpyrifos (MRL 0.5 mg/kg) at 1.4 mg/kg

Acute risk:
An acute risk assessment for chlorpyrifos shows that the short term intakes (worst case NESTI is for toddlers at 0.0763 mg/kg bw/day) are below the ARfD of 0.1 mg/kg. Therefore the acute risk to consumers is acceptable. See Table D.

Conclusions:
There is no concern for consumer health. However, in view of the MRL exceedance, we have written to the authorities concerned notifying them of this finding.

ii) Risk assessment for grapes (special) – containing parathion-methyl (no MRL) at 0.1 mg/kg

Acute risk:
An acute risk assessment for parathion-methyl shows that the short term intakes (worst case NESTI is for toddlers at 0.0054 mg/kg bw/day) are below the ARfD of 0.03 mg/kg. Therefore, the acute risk to consumers is acceptable. See Table D.

Conclusions:
There is no concern for consumer health.

Canned Salmon

Twenty six samples of salmon were found to contain DDT (present either as p,p-DDE only or as p,p-DDE with p,p-TDE) (no MRL) at the highest level found of 0.01 mg/kg and one sample was found to contain hexachlorobenzene (no MRL) at 0.002 mg/kg.

i) Risk assessment for canned salmon – containing DDT(present either as p,p-DDE only or as p,p-DDE with p,p-TDE) (no MRL) at the highest level found of 0.01 mg/kg

Chronic risk:
Intakes are based on total fish consumption. Since a large proportion of the samples were found to contain DDT, it is considered appropriate to carry out a chronic risk assessment. JMPR (2000) concluded that an acute risk assessment was not appropriate for DDT.

A chronic risk assessment for DDT shows that the chronic intake estimates (worst case is for an infant at 0.000039 mg/kg bw/day) are well below the “provisional tolerable daily intake” of 0.01 mg/kg. Therefore the chronic risk to consumers is acceptable. See Table C.

Conclusions:

There is no concern for consumer health.

ii) Risk assessment for canned salmon – containing hexachlorobenzene (no MRL) at 0.002 mg/kg

Acute risk:
An acute risk assessment for hexachlorobenzene shows that the short term intakes (worst case NESTI is for toddlers at 0.00001 mg/kg bw/day) are well below the ADI (there is no specific ARfD) of 0.0005 mg/kg bw/day. Therefore the acute risk to consumers is acceptable. See Table D.

Chronic risk:
It is considered appropriate to carry out a chronic risk assessment for hexachlorobenzene. A chronic risk assessment for hexachlorobenzene shows that the chronic intake estimates (worst case is for an infant at 0.000008 mg/kg bw/day) are well below the provisional tolerable daily intake of 0.01 mg/kg bw/day. Therefore the chronic risk to consumers is acceptable. See Table C.

Conclusions:
There is no concern for consumer health.

Fresh Salmon

Residues of 3 pesticides which do not have any MRLs were found in fresh salmon. Chlordane was found at the highest level of 0.006 mg/kg. DDT was found at the highest level of 0.04 mg/kg. Hexachlorobenzene was found at the highest level of 0.003 mg/kg.

i) Risk assessment for fresh salmon – containing chlordane (no MRL) at 0.006 mg/kg

Chronic risk:
A chronic risk assessment for chlordane shows that the chronic intake estimates (worst case is for an infant at 0.000023 mg/kg bw/day) are below the provisional tolerable daily intake of 0.0005 mg/kg bw/day. Therefore the chronic risk to consumers is acceptable. See Table C.

Conclusions:
There is no concern for consumer health.

ii) Risk assessment for fresh salmon – containing DDT (no MRL) at 0.04 mg/kg

Chronic risk:
A chronic risk assessment for DDT shows that the chronic intake estimates (worst case is for an infant at 0.000156 mg/kg bw/day) are below the provisional tolerable daily intake of 0.01 mg/kg bw/day. Therefore the chronic risk to consumers is acceptable. See Table C.

Conclusions:
There is no concern for consumer health.

iii) Risk assessment for fresh salmon – containing hexachlorobenzene (no MRL) at 0.003 mg/kg

Chronic risk:
A chronic risk assessment for hexachlorobenzene shows that the chronic intake estimates (worst case is for an infant at 0.000012 mg/kg bw/day) are below the ADI of 0.0005 mg/kg bw/day. Therefore the chronic risk to consumers is acceptable. See Table C.

Conclusions:
There is no concern for consumer health.

Mango

One sample of mangoes was found to contain omethoate (no MRL) at 0.02 mg/kg. One sample of mangoes was found to contain azoxystrobin (MRL 0.05 mg/kg) at 0.06 mg/kg.

i) Risk assessment for mangoes – containing omethoate (no MRL) at 0.02 mg/kg

Omethoate can occur as a residue of dimethoate, therefore the equivalent level of dimethoate is calculated as 0.16 mg/kg (0.02 mg/kg x 8 conversion factor from omethoate to dimethoate because omethoate is 8 times more toxic than dimethoate). In the absence of specific portion size consumption data for mangoes, intake estimates have had to be based on melon which should represent a worst case estimate.

Acute risk:
An acute risk assessment for dimethoate shows that the short term intakes (worst case NESTI is for toddlers at 0.0167 mg/kg bw/day) are below the ARfD of 0.03 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
There is no concern for consumer health.

ii) Risk assessment for mangoes – containing azoxystrobin (MRL 0.05 mg/kg) at 0.06 mg/kg

Acute risk:
An acute risk assessment for azoxystrobin shows that the short term intakes (worst case NESTI is for toddlers at 0.0063 mg/kg bw/day) are below the ADI of 0.1 mg/kg bw/day. Therefore the acute risk is acceptable. See Table D.

Conclusions:
There is no concern for consumer health. However, in view of the MRL exceedance, we have written to the authorities concerned notifying them of these findings.

Nectarines

One sample of nectarines from Italy was found to contain methamidophos (MRL 0.05 mg/kg) at 0.06 mg/kg and acephate (MRL 0.02 mg/kg) at 0.1 mg/kg. One sample of nectarines was found to contain bromopropylate (no MRL) at 0.1 mg/kg. One sample was found to contain fenpropimorph (no MRL) at 0.06 mg/kg.

i) Risk assessment for nectarines - containing methamidophos (MRL 0.05 mg/kg) at 0.06 mg/kg

Acute risk:
An acute risk assessment for methamidophos shows that the short term intakes (worst case NESTI is toddlers at 0.0043 mg/kg bw/day) is above the acute reference dose (ARfD) of 0.004 mg/kg. Although the safety margins built into the ARfD would be eroded, adverse health effects would be unlikely to result from these exceedances. See Table D.

Conclusions:
A risk assessment shows that the ARfD is exceeded for toddlers. Although the safety margins would be eroded, adverse health effects would be unlikely to result from these exceedances. Due to the MRL exceedance we have contacted the Italian authorities notifying them of this incident.

ii) Risk assessment for nectarines - containing acephate (MRL 0.02 mg/kg) at 0.1 mg/kg

Acute risk:
An acute risk assessment for acephate shows that the short term intakes (worst case NESTI is for toddlers at 0.0072 mg/kg bw/day) is below the acute reference dose (ARfD) of 0.03 mg/kg. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
A risk assessment shows that there is no concern for consumer health. Due to the MRL exceedance we have contacted the Italian authorities notifying them of this incident.

iii) Risk assessment for nectarines - bromopropylate (no MRL) at 0.1 mg/kg

Acute risk:
An acute risk assessment for bromopropylate shows that the short term intake (worst case NESTI is for toddlers at 0.0072 mg/kg bw/day) is

below the ARfD of 0.2 mg/kg. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
There is no concern for consumer health.

iv) Risk assessment for nectarines – fenpropimorph (no MRL) at 0.06 mg/kg

Acute risk:
An acute risk assessment for fenpropimorph shows that the short term intake (worst case NESTI is for toddlers at 0.0043 mg/kg bw/day) is below the ARfD of 0.009 mg/kg. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
There is no concern for consumer health.

Peaches

Two samples of peaches were found to contain methamidophos (MRL 0.05 mg/kg) at 0.09 and 0.4 mg/kg.

i) Risk assessment for peaches – containing methamidophos (MRL 0.05 mg/kg) at 0.4 mg/kg

Acute risk:
An acute risk assessment for methamidophos shows that the short term intakes (for a toddler at 0.02 mg/kg bw/day and an adult at 0.005 mg/kg) are both above the ARfD of 0.004 mg/kg bw/day. The NESTI for adults and toddlers are 1.3x and 5x the ARfD. Although the safety margins built into the ARfD have been significantly eroded, adverse health effects would be unlikely to result from these exceedances. See Table D.

Conclusions:
Although the ARfD is exceeded, adverse health effects would be unlikely. However, erosion of safety margins is of concern. In view of the MRL exceedance, we have written to the authorities concerned notifying them of these findings.

ii) Risk assessment for peaches – containing methamidophos (MRL 0.05 mg/kg) at 0.09 mg/kg

Acute risk:
An acute risk assessment for methamidophos shows that the short term intakes (worst case for a toddler at 0.005 mg/kg bw/day) is above the ARfD of 0.004 mg/kg bw/day. Although the safety margins built into the ARfD would have been eroded, adverse health effects would be unlikely to result from these exceedances. See Table D.

Conclusions:
Although the safety margins built into the ARfD would have been eroded, adverse health effects would be unlikely to result from these exceedances. However, in view of the MRL exceedance, we have written to the authorities concerned notifying them of these findings.

Soft citrus

One sample of soft citrus was found to contain imazalil (MRL 5 mg/kg) at 6.5 mg/kg. Tetradifon (no MRL) was found in one sample at 0.1 mg/kg.

i) Risk assessment for soft citrus – containing imazalil (MRL 5 mg/kg) at 6.5 mg/kg

Acute risk:

An ARfD was not set by the EU review (2000) or JMPR (2001) due to both bodies coming to the same conclusion that the toxicological profile of imazalil was not considered to indicate an acute concern. It is not appropriate to conduct a chronic risk assessment as the median residue found would be below the MRL.

An acute risk assessment for imazalil shows that the intake estimates (worst case for a toddler at 0.3 mg/kg bw/day) are well above the ADI of 0.03 mg/kg, therefore the acute risk indicates an unacceptable risk for all consumer groups. However, although the NESTIs for adults and toddlers were 2.3x and 10x the ADI, processing studies carried out using imazalil as a post-harvest dip (its main use), reveal that the vast majority of residue would be expected to be in the peel.

Conclusions:
A risk assessment has shown that although the ADI would be exceeded, when processing factors are taken into consideration the levels of imazalil found do not present any concern for consumer health. However, in view of the MRL exceedance, we have written to the authorities concerned notifying them of these findings.

ii) Risk assessment for soft citrus – containing tetradifon (no MRL) at 0.1 mg/kg

Acute risk:
An ARfD was not available for tetradifon, therefore the ADI has been used instead.

An acute risk assessment for tetradifon shows that the intake estimates (worst case for a toddler at 0.0005 mg/kg bw/day) are below the ADI of 0.0025 mg/kg bw/day, therefore the acute risk is acceptable for all consumer groups.

Conclusions:

A risk assessment has shown that there is no concern for consumer health.

Celery

Iprodione (MRL 0.02 mg/kg) was found in 2 UK samples at 0.02 mg/kg and 0.06 mg/kg. Cypermethrin (MRL 0.05 mg/kg) was found in 2 samples at 0.07 and 0.5 mg/kg. The second sample also contained diazinon (MRL 0.02 mg/kg) at 0.5 mg/kg. Chlorpropham (no MRL) was found ranging from 0.02 to 0.2 mg/kg, cyhalothrin (no MRL) was found ranging from 0.02 to 0.03 mg/kg and dichlofluanid (no MRL) was found at 0.09 mg/kg.

i) Risk assessment for celery – containing iprodione (MRL 0.02 mg/kg) at the highest level of 0.06 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for iprodione shows that the short term intakes (worst case for a toddler at 0.0006 mg/kg bw/day) are below the ADI of 0.06 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:
A risk assessment has shown that the level of iprodione found does not present any concern for consumer health.

ii) Risk assessment for celery – containing cypermethrin (MRL 0.05 mg/kg) found at the highest level of 0.5 mg/kg

Acute risk:
An acute risk assessment for cypermethrin shows that the short term intakes (worst case for a toddler at 0.005 mg/kg bw/day) are below the ARfD of 0.02 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:
A risk assessment has shown that the level of cypermethrin found does not present any concern for consumer health. However, in view of the MRL exceedance, we have written to the authorities concerned notifying them of these findings.

iii) Risk assessment for celery – containing diazinon (MRL 0.02 mg/kg) at 0.5 mg/kg

Acute risk:
An acute risk assessment for diazinon shows that the short term intakes (worst case for a toddler at 0.005 mg/kg bw/day) are below the ARfD of 0.03 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:
A risk assessment has shown that the level of diazinon found does not present any concern for consumer health. However, in view of the MRL exceedance, we have written to the authorities concerned notifying them of these findings.

iv) Risk assessment for celery – containing dichlofluanid (no MRL) at 0.09 mg/kg

N.B. an ARfD was not available, therefore the ADI has been used.

Acute risk:
An acute risk assessment for dichlofluanid shows that the short term intakes (worst case for a toddler at 0.0009 mg/kg bw/day) are below the ADI of 0.3 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:
A risk assessment has shown that the level of dichlofluanid found does not present any concern for consumer health.

v) Risk assessment for celery – containing cyhalothrin (no MRL) at the highest level found of 0.03 mg/kg

N.B. an ARfD was not available, therefore the ADI has been used.

Acute risk:
An acute risk assessment for cyhalothrin shows that the short term intakes (worst case for a toddler at 0.0003 mg/kg bw/day) are below the ADI of 0.002 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:
A risk assessment has shown that the level of cyhalothrin found does not present any concern for consumer health.

vi) Risk assessment for celery – containing chlorpropham (no MRL) at the highest level found of 0.2 mg/kg

Acute risk:
An acute risk assessment for chlorpropham shows that the short term intakes (worst case for a toddler at 0.002 mg/kg bw/day) are below the ARfD of 0.03 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:
A risk assessment has shown that the level of chlorpropham found does not present any concern for consumer health.

Starfruit

Three samples of starfruit were found to contain chlorpyrifos (MRL 0.05 mg/kg) all at 0.08 mg/kg.

i) Risk assessment for starfruit – containing chlorpyrifos (MRL 0.05 mg/kg) at 0.08 mg/kg

Acute risk:

In the absence of specific portion size consumption data for starfruit, intake estimates have had to be based on mandarins which should represent a worst case estimate.

An acute risk assessment for chlorpyrifos shows that the short term intakes (worst case for an adult at 0.0009 mg/kg bw/day) are below the ARfD of 0.1 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:

A risk assessment has shown that the levels of chlorpyrifos found do not present any concern for consumer health. However, in view of the MRL exceedance, we have written to the Malaysian authorities notifying them of these findings.

Potatoes

Chlorpropham (no MRL) was found at levels ranging from 0.06 to 6.6 mg/kg. Oxadixyl (no MRL) was found at levels ranging from 0.02 to 0.2 mg/kg. Three samples contained MRL exceedances; aldicarb (MRL 0.5 mg/kg) was found in 1 UK new potato sample at 0.6 mg/kg; maleic hydrazide (MRL 1 mg/kg) was found in 1 sample of UK new potatoes at 5.8 mg/kg and 1 sample of imported new potatoes at 25 mg/kg.

Probabilistic modelling

This is of relevance to the risk assessment for aldicarb and chlorpropham in potatoes.

The standard calculation of consumer exposure is presented below in Table D. This point estimate approach indicates that short term intakes could exceed the ARfD. Whilst the standard methodology uses realistic consumption data and residue levels, they will tend to overestimate intake in most circumstances. This is due to the assumptions used; fruit and vegetables would contain high levels of residue in an individual unit and that these would be consumed by high level consumers i.e. at the 97.5^{th} percentile. They do not take into account the possible range of residue levels and consumption distributions that may occur in reality. These possible combinations of residues and consumption levels can be taken into account using modelling/simulation techniques to produce probability distributions of residue intake levels to indicates the range of consumer intakes, presented as

a probabilistic assessment of consumer exposure. Application of these techniques is a relatively new development in consumer risk assessment.

Concerns relating to short term exposure to aldicarb residues from the consumption of potatoes were identified through the EU review also. The risk assessment was refined using a probabilistic approach. This takes into account both the range of different consumption levels of particular commodities and the range of different residues levels in the commodities to produce a distribution of exposure levels. Under the review, commodities other than potatoes were considered also (carrots, oranges and bananas). The results indicated that for all toddlers, the probability of exceeding the ARfD was 0.01% or 1 in 10,000 days.

The highest residue found in this PRC survey was in line with the highest residue considered using the probabilistic modelling under the EU review. Therefore whilst the residue is slightly higher than the MRL, it would not be anticipated to significantly increase the level of exposure to consumers above that considered under the EU review.

i) Risk assessment for potatoes – containing chlorpropham (no MRL) at the highest level found of 6.6 mg/kg

Acute risk and probabilistic modelling:

The standard calculation of consumer exposure is presented below in Table D. This point estimate approach indicates that short term intakes could exceed the ARfD. When peeling and cooking (processing factors) are taken into consideration, it is considered that there is no unacceptable risk to consumers from consumption of potatoes which are prepared in this way. For potatoes which are cooked but not peeled, exceedance of the ARfD could still occur. Chlorpropham is also under review in the EU and similar concerns were identified with the short term consumer intakes. Under the EU review the risk assessment for potatoes was refined using probabilistic modelling. The residues found in the PRC survey are within the proposed MRL of 10 mg/kg being considered under the EU review and therefore within those assessed using probabilistic modelling.

Conclusions:
A risk assessment using standard methodology has shown that the consumption of cooked unpeeled potatoes containing levels of chlorpropham found in this survey could exceed the ARfD. There is no exceedance for cooked peeled potatoes and potato products such as crisps. Similar concerns were found under the EU review and the risk assessment was refined using probabilistic modelling. The levels found in the PRC survey are within the proposed MRL of 10 mg/kg being considered under the EU review for chlorpropham and considered using probabilistic modelling.

ii) Risk assessment for potatoes – containing oxadixyl (no MRL) at 0.2 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for oxadixyl shows that the short term intakes (worst case for a toddler at 0.02 mg/kg bw/day) are below the ADI of 0.11 mg/kg, therefore the acute risk is acceptable for all consumer groups. See Table D.

Conclusions:
A risk assessment has shown that the levels of oxadixyl found do not present any concern for consumer health.

iii) Risk assessment for potatoes – containing aldicarb (MRL 0.5 mg/kg) at 0.6 mg/kg

Acute risk:
An acute risk assessment for aldicarb shows that the short term intakes (worst case for a toddler at 0.06 mg/kg bw/day) are above the ARfD of 0.003 mg/kg. Therefore, using this standard calculation of consumer risk the ARfD is exceeded. See Table D.

Probabilistic modelling – Risk assessment:

A short term consumer risk assessment (above) has been carried out for the residue of aldicarb reported in new potatoes at 0.6 mg/kg which exceeds the MRL of 0.5 mg/kg.

The MRL of 0.5 mg/kg for aldicarb on potatoes would have been set based on residue trials data for potatoes which all would have been treated at the maximum application rate, the maximum number of treatments and the minimum harvest interval. The MRL would have been set to accommodate the highest residues found in composite samples of potatoes sampled and analysed from these trials. (This is exactly the same procedure as for any MRL that is set). The risk assessment which was carried out using probabilistic modelling used residue levels from all trials and also residues for individual tubers from trials.

Concerns relating to short term exposure to aldicarb residues from the consumption of potatoes were identified through the EU review. The risk assessment was refined using a probabilistic approach. This takes into account both the range of different consumption levels of particular commodities and the range of different residues levels in the commodities to produce a distribution of exposure levels. In this particular case commodities other than potatoes were considered also (carrots, oranges and bananas). The results indicated that for all

toddlers, the probability of exceeding the ARfD was 0.01% or 1 in 10,000 days.

The risk assessment for the residue found at 0.6 mg/kg has bee refined to take into account 55% loss of residues due to cooking (average value for standard and microwave boiling) and also uses a variability factor of 4 which has been specifically defined for aldicarb/potatoes from actual trials rather than the standard default factor of 10.

Short term intakes based for high level consumers exposed to the highest theoretical levels of aldicarb, are *ca* 1.4 and 6.3 times the ARfD of 0.003 mg/kg bw/day for adults and toddlers, respectively. These levels of exceedance would result in erosion of the assessment factors built into the ARfD but are below the level which produced effects in healthy human adult volunteers which were mild and transient (i.e. profuse sweating).

The residue of 0.6 mg/kg found in this survey was in line with the highest residue considered using the probabilistic modelling under the EU review. Therefore, whilst the residue is slightly higher than the MRL, it would not be anticipated to significantly increase the level of exposure to consumers above that considered in the EU review.

Conclusions:
A risk assessment has shown that although the levels of aldicarb found are slightly above the MRL, it would not be anticipated to significantly increase the level of exposure to consumers above that considered in the EU review.

iv) Risk assessment for potatoes – containing maleic hydrazide (MRL 1 mg/kg) at the highest level found on 25 mg/kg

Acute risk:
An acute risk assessment is not appropriate due to the toxicological profile of maleic hydrazide and it not being considered to indicate an acute concern.

Chronic risk:
As the NESTI's for adults and children exceeded the ADI, a chronic risk has been carried out using the medium residue of 1 mg/kg.

A chronic risk assessment for maleic hydrazide shows that the chronic intake estimates (worst case is for infants at 0.01 mg/kg bw/day) are below the ADI of 0.3 mg/kg bw/day. Therefore the chronic risk to consumers is acceptable. See Table C.

Conclusion:

There is no concern for consumer health.

Tomatoes

A number of pesticides were found which do not have any set MRLs: tetradifon was found at 0.06 mg/kg; bifenthrin was found ranging from 0.03 to 0.04 mg/kg; bupirimate was found at 0.2 mg/kg; fenhexamid was found at 0.2 mg/kg; furalaxyl was found at 0.02 mg/kg; oxadixyl was found ranging from 0.06 to 0.1 mg/kg; and pyrimethanil was found ranging from 0.1 to 0.3 mg/kg.

i) Risk assessment for tomatoes – containing tetradifon (no MRL) at 0.06 mg/kg

Acute risk:

N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for tetradifon shows that the short term intakes (worst case for a toddler at 0.003 mg/kg bw/day) are above the ADI of 0.0025 mg/kg bw/day. Although the safety margins built into the ADI would be eroded, adverse health effects would be unlikely to result from this exceedance. See Table D.

Conclusions:

A risk assessment has shown that the levels of tetradifon found do not present any concern for adults, however for toddlers, the ADI is slightly exceeded. Although the safety margins built into the ADI would have been eroded, adverse health effects would be unlikely to result from this exceedance.

ii) Risk assessment for tomatoes – containing bifenthrin (no MRL) ranging from 0.03 to 0.04 mg/kg

Acute risk:

N.B. an ARfD was not available , therefore the ADI has been used.

An acute risk assessment for bifenthrin at the highest level found of 0.04 mg/kg shows that the short term intakes (worst case for a toddler at 0.002 mg/kg bw/day) are below the ADI of 0.01 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:

A risk assessment has shown that the levels of bifenthrin found do not present any concern for consumers.

iii) Risk assessment for tomatoes – containing bupirimate (no MRL) at 0.2 mg/kg

Acute risk:

N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for bupirimate found at 0.2 mg/kg shows that the short term intakes (worst case for a toddler at 0.008 mg/kg bw/day)

are below the ADI of 0.01 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
A risk assessment has shown that the levels of bupirimate found do not present any concern for consumers.

iv) Risk assessment for tomatoes – containing fenhexamid (no MRL) at 0.2 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for fenhexamid found at 0.2 mg/kg shows that the short term intakes (worst case for a toddler at 0.008 mg/kg bw/day) are below the ADI of 0.2 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
A risk assessment has shown that the levels of fenhexamid found do not present any concern for consumers.

v) Risk assessment for tomatoes – containing furalaxyl (no MRL) at 0.02 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for furalaxyl found at 0.02 mg/kg shows that the short term intakes (worst case for a toddler at 0.0008 mg/kg bw/day) are below the ADI of 0.0009 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
A risk assessment has shown that the levels of furalaxyl found do not present any concern for consumers.

vi) Risk assessment for tomatoes – containing oxadixyl (no MRL) ranging from 0.06 to 0.1 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for oxadixyl found at the highest level of 0.1 mg/kg shows that the short term intakes (worst case for a toddler at 0.004 mg/kg bw/day) are below the ADI of 0.11 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:

A risk assessment has shown that the levels of oxadixyl found do not present any concern for consumers.

vii) Risk assessment for tomatoes – containing pyrimethanil (no MRL) ranging from 0.1 to 0.3 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for pyrimethanil found at the highest level of 0.3 mg/kg shows that the short term intakes (worst case for a toddler at 0.01 mg/kg bw/day) are below the ADI of 0.2 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
A risk assessment has shown that the levels of pyrimethanil found do not present any concern for consumers.

Lettuce

Azoxystrobin (MRL 0.05 mg/kg) was found in 1 sample exceeding the MRL at 0.9 mg/kg. Inorganic bromide (CAC MRL 100 mg/kg) was found in 1 sample exceeding the MRL at 164 mg/kg. Propyzamide (no MRL) was found in one sample at 0.02 mg/kg. Imidacloprid (no MRL) was found in one sample at 0.07 mg/kg.

i) Risk assessment for lettuce – containing azoxystrobin (MRL 0.05 mg/kg) at the highest level found of 0.9 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for azoxystrobin found at 0.9 mg/kg shows that the short term intakes (worst case for a toddler at 0.008 mg/kg bw/day) are below the ADI of 0.1 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:

A risk assessment has shown that the levels of azoxystrobin found do not present any concern for consumers.

ii) Risk assessment for lettuce – containing inorganic bromide (CAC MRL 100 mg/kg) at 164 mg/kg

Acute risk:
An acute risk assessment for inorganic bromide found at 164 mg/kg shows that the short term intakes (worst case for a toddler at 1.4 mg/kg bw/day) are above the ARfD of 0.9 mg/kg bw/day. Although the safety margins built into the ARfD would be significantly eroded,

adverse health effects would be unlikely to result from this exceedance. See Table D.

Conclusions:
A risk assessment has shown that the ARfD is exceeded, however, although the safety margins built into the ARfD would be significantly eroded, adverse health effects would be unlikely to result from this exceedance. These results are an improvement to previous survey results, when in 1999, a level of 1450 mg/kg inorganic bromide was found in one sample.

iii) Risk assessment for lettuce – containing propyzamide (no MRL) at 0.02 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for propyzamide found at 0.02 mg/kg shows that the short term intakes (worst case for a toddler at 0.0002 mg/kg bw/day) are below the ADI of 0.03 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
A risk assessment has shown that the levels of propyzamide found do not present any concern for consumers.

iv) Risk assessment for lettuce – containing imidacloprid (no MRL) at 0.07 mg/kg

Acute risk:
An acute risk assessment for imidacloprid found at 0.07 mg/kg shows that the short term intakes (worst case for a toddler at 0.0006 mg/kg bw/day) are below the ARfD of 0.4 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
A risk assessment has shown that the levels of imidacloprid found do not present any concern for consumers.

Grapefruit

Tetradifon (no MRL) was found in 2 samples ranging from 0.09 to 0.1 mg/kg.

i) Risk assessment for grapefruit – containing tetradifon (no MRL) at the highest level found of 0.1 mg/kg

Acute risk:
N.B. an ARfD was not available, therefore the ADI has been used.

An acute risk assessment for tetradifon found at 0.1 mg/kg shows that the short term intakes (worst case for a toddler at 0.008 mg/kg bw/day) are above the ADI of 0.0025 mg/kg bw/day. The short term intakes indicate that the risk to adults is acceptable, however, the short term intake is 3.2x the ADI for toddlers. Although the safety margins built into the ADI would be eroded, adverse health effects would be unlikely to result from this exceedance. See Table D.

Conclusions:
A risk assessment has shown that the levels of tetradifon found indicate an acceptable risk for adults, however the ADI is exceeded for toddlers. The safety margins built into the ADI would be eroded, and erosion of safety margins is of concern. However, adverse health effects would be unlikely.

Mushrooms

Three samples of mushrooms were found to contain gamma-HCH (no MRL) at 0.08 to 0.1 mg/kg. One sample of mushrooms was found to contain omethoate and dimethoate at 0.2 and <0.05 mg/kg, respectively.

i) Risk assessment for mushrooms – containing gamma-HCH (no MRL) at the highest level found of 0.1 mg/kg

Acute risk:
An acute risk assessment for gamma-HCH found at 0.1 mg/kg shows that the short term intakes (worst case for a toddler at 0.0003 mg/kg bw/day) are below the ARfD of 0.01 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
A risk assessment has shown that the levels of gamma-HCH found do not present any concern for consumers.

ii) Risk assessment for mushrooms – containing omethoate (MRL 0.2 mg/kg) and dimethoate (MRL 1 mg/kg) at 0.2 mg/kg and <0.05 mg/kg, respectively

N.B. Assume dimethoate level as worst case is 0.05 mg/kg.

The estimated level of dimethoate in the sample of mushrooms has been calculated to be 2.1 mg/kg (dimethoate 0.05 mg/kg + omethoate 0.2 mg/kg x 8 (a conversion factor of x 8 is used to convert to dimethoate, because omethoate is 8 times more toxic than dimethoate).

Acute risk
An acute risk assessment for dimethoate found at 2.1 mg/kg shows that the short term intakes (worst case for a toddler at 0.007 mg/kg bw/day) are below the ARfD for dimethoate of

0.03 mg/kg bw/day. Therefore the risk to consumers is acceptable. See Table D.

Conclusions:
There is no concern for consumer health.

Strawberries

Bupirimate (no MRL) was found in a number of samples ranging from 0.02 to 0.8 mg/kg. Fenhexamid (no MRL) was found in 58 samples ranging from 0.05 to 4.3 mg/kg. Pyrimethanil (no MRL) was found in various samples ranging from 0.02 to 0.9 mg/kg. Cyprodinil (no MRL) was found in several samples ranging from 0.02 to 0.1 mg/kg. Trifloxystrobin (no MRL) was found in 2 samples at 0.06 mg/kg. There were 4 MRL exceedances. Penconazole (CAC MRL 0.1 mg/kg) was found at levels exceeding the MRL at 0.2 mg/kg. Kresoxim-methyl (MRL 0.05 mg/kg) was found at 0.09 mg/kg in one sample. Dicofol (MRL 0.02 mg/kg) was found in 2 samples at 0.2 mg/kg.

i) Risk assessment for strawberries – containing bupirimate (no MRL) at the highest level found of 0.8 mg/kg

N.B. An ARfD was not available for bupirimate.

Acute risk:
An acute risk assessment for bupirimate found at 0.8 mg/kg shows that the short term intakes (worst case for a toddler at 0.006 mg/kg bw/day) are below the ADI of 0.01 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

ii) Risk assessment for strawberries – containing fenhexamid (no MRL) at the highest level found of 4.3 mg/kg

N.B. An ARfD has not been set for fenhexamid.

Acute risk:
An acute risk assessment for fenhexamid found at 4.3 mg/kg shows that the short term intakes (worst case for a toddler at 0.03 mg/kg bw/day) are below the ADI of 0.2 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

iii) Risk assessment for strawberries – containing pyrimethanil (no MRL) at the highest level found of 0.9 mg/kg

N.B. An ARfD was not available.

Acute risk:
An acute risk assessment for pyrimethanil found at 0.9 mg/kg shows that the short term intakes (worst case for a toddler at 0.007 mg/kg bw/day) are below the ADI of 0.2 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

iv) Risk assessment for strawberries – containing cyprodinil (no MRL) at the highest level found of 0.1 mg/kg

N.B. An ARfD was not available.

Acute risk:
An acute risk assessment for cyprodinil found at 0.1 mg/kg shows that the short term intakes (worst case for a toddler at 0.0008 mg/kg bw/day) are below the ADI of 0.03 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

v) Risk assessment for strawberries – containing trifloxystrobin (no MRL) at 0.06 mg/kg

N.B. An ARfD was not set.

Acute risk:
An acute risk assessment for trifloxystrobin found at 0.06 mg/kg shows that the short term intakes (worst case for a toddler at 0.0005 mg/kg bw/day) are below the ADI of 0.1 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

vi) Risk assessment for strawberries – containing penconazole (CAC MRL 0.1 mg/kg) at 0.2 mg/kg

N.B. An ARfD was not available.

Acute risk:
An acute risk assessment for penconazole found at 0.2 mg/kg shows that the short term intakes (worst case for a toddler at 0.002 mg/kg bw/day) are below the ADI of 0.03 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:

There is no concern for consumer health.

vii) Risk assessment for strawberries – containing kresoxim-methyl (MRL 0.05 mg/kg) at 0.09 mg/kg

N.B. An ARfD has not been set for kresoxim-methyl.

Acute risk:
An acute risk assessment for kresoxim-methyl found at 0.09 mg/kg shows that the short term intakes (worst case for a toddler at 0.0007 mg/kg bw/day) are below the ADI of 0.4 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health

viii) Risk assessment for strawberries – containing dicofol (MRL 0.02 mg/kg) at 0.2 mg/kg

Acute risk:
An acute risk assessment for dicofol found at 0.2 mg/kg shows that the short term intakes (worst case for a toddler at 0.002 mg/kg bw/day) are below the ARfD of 0.1 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health

Bran

There were several residues found for which there are no MRLs. Chlormequat, etrimfos, glyphosate and pirimiphos-methyl were found at the highest levels of 6.3, 0.2, 1.8 and 1.5 mg/kg.

i) Risk assessment for bran – containing chlormequat (no MRL) at the highest level found of 6.3 mg/kg

Acute risk:
An acute risk assessment for chlormequat found at 6.3 mg/kg shows that the short term intakes (worst case for a toddler at 0.0196 mg/kg bw/day) are below the ARfD of 0.05 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

ii) Risk assessment for strawberries – containing etrimfos (no MRL) at the highest level found of 0.2 mg/kg

N.B. An ARfD was not available for etrimfos.

Acute risk:
An acute risk assessment for etrimfos found at 0.2 mg/kg shows that the short term intakes (worst case for a toddler at 0.0006 mg/kg bw/day) are below the ADI of 0.003 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

iii) Risk assessment for bran – containing glyphosate (no MRL) at the highest level found of 0.25 mg/kg

Acute risk:
An acute risk assessment for glyphosate found at 0.25 mg/kg shows that the short term intakes (worst case for a toddler at 0.0056 mg/kg bw/day) are below the ARfD of 0.25 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

iv) Risk assessment for bran – containing pirimiphos-methyl (no MRL) at the highest level found of 1.5 mg/kg

Acute risk:
An acute risk assessment for pirimiphos-methyl found at 1.5 mg/kg shows that the short term intakes (worst case for a toddler at 0.0047 mg/kg bw/day) are below the ARfD of 0.15 mg/kg bw/day. Therefore, there is no concern for consumer health. See Table D.

Conclusions:
There is no concern for consumer health.

Infant food (meat/fish/egg based)

Residues of chlorpropham (no MRL) were found at 0.02 to 0.03 mg/kg. ETU (no MRL) was found at 0.01 mg/kg.

i) Risk assessment for infant food – containing chlorpropham (no MRL) at the highest level found of 0.03 mg/kg

N.B. Consumption data have been based on the assumption that an infant might consume two 205 g jars of the same product from the same batch in a single day. Since these are ready prepared products, it is not appropriate to use a variability factor.

Acute risk:
An acute risk assessment for chlorpropham found at 0.03 mg/kg shows that the short term intakes for a toddler at 0.0002 mg/kg bw/day is

below the ARfD of 0.03 mg/kg bw/day. Therefore, there is no concern for infant health. See Table D.

Conclusions
There is no concern for infant health.

ii) Risk assessment for infant food – containing ETU (no MRL) at 0.01 mg/kg

N.B. Consumption data have been based on the assumption that an infant might consume two 205 g jars of the same product from the same batch in a single day. Since these are ready prepared products, it is not appropriate to use a variability factor.

Acute risk:
An acute risk assessment for ETU found at 0.01 mg/kg shows that the short term intakes for a toddler at 0.0001 mg/kg bw/day is below the ARfD of 0.05 mg/kg bw/day. Therefore, there is no concern for infant health. See Table D.

Conclusions
There is no concern for infant health.

Courgette

A residue of buprofezin (no MRL) was found at 0.07 mg/kg and two residues of oxamyl (no MRL) were found at 0.1 mg/kg.

i) Risk assessment for courgette – containing buprofezin (no MRL) at 0.07 mg/kg

Chronic risk:

A chronic risk assessment for buprofezin shows that the chronic intake estimates (worst case for a toddler at 0.000168 mg/kg bw/day) are well below the ADI of 0.01 mg/kg. Therefore the chronic risk to consumers is acceptable. See Table C.

Acute risk:
Residues of buprofezin (no MRL) were found in courgette at 0.07 mg/kg. However, acute risk assessment is not relevant for buprofezin based on its toxicological profile, so acute intakes have not been carried out. See Table D.

Conclusions
There is no concern for consumer health.

ii) Risk assessment for courgettes – containing oxamyl (no MRL) at 0.1 mg/kg

Acute risk:
An acute risk assessment for oxamyl found at 0.1 mg/kg shows that the short term intakes (worst case for a toddler at 0.0029 mg/kg bw/day) are below the ARfD of 0.006 mg/kg bw/day. Therefore, there is no concern for consumer health.

Conclusions
There is no concern for consumer health.

Apples

There were a number of residues found with no MRLs: bupirimate was found at 0.05 to 0.07 mg/kg; bromopropylate was found at 0.1 to 0.4 mg/kg; and parathion-methyl was found at 0.05 mg/kg.

i) Risk assessment for apples – containing bupirimate (no MRL) at the highest level found at 0.07 mg/kg

Acute risk:
An acute risk assessment for bupirimate found at 0.07 mg/kg shows that the short term intakes (worst case for a toddler at 0.0041 mg/kg bw/day) are below the ADI of 0.01 mg/kg bw/day. Therefore, there is no concern for consumer health.

Conclusions
There is no concern for consumer health.

ii) Risk assessment for apples – containing bromopropylate (no MRL) at the highest level found at 0.4 mg/kg

Acute risk:
An acute risk assessment for bromopropylate found at 0.4 mg/kg shows that the short term intakes (worst case for a toddler at 0.0219 mg/kg bw/day) are below the ARfD of 0.02 mg/kg bw/day. Therefore, there is no concern for consumer health.

Conclusions
There is no concern for consumer health.

iii) Risk assessment for apples – containing parathion-methyl (no MRL) found at 0.05 mg/kg

Acute risk:
An acute risk assessment for parathion-methyl found at 0.05 mg/kg shows that the short term intakes (worst case for a toddler at 0.003 mg/kg bw/day) are below the ARfD of 0.03 mg/kg bw/day. Therefore, there is no concern for consumer health.

Conclusions
There is no concern for consumer health.

Table C: Chronic intake estimates

Crop	Pesticide	Residue (mg/kg)	ADI (mg/kg bw/day)	Source	Intakes (mg/kg bw/day)			
					Adult	Child	Toddler	Infant
Canned salmon	DDT	0.01	0.01*	JMPR 2001	0.000016	0.000013	0.000035	0.000039
Canned salmon	Hexachloro-benzene	0.002	0.01*	PSD internal one	0.000003	0.000003	0.000007	0.000008
Fresh salmon	Chlordane	0.006	0.0005*	JMPR 1994	0.000009	0.000008	0.000021	0.000023
Fresh salmon	DDT	0.04	0.01*	JMPR 2002	0.000063	0.000052	0.000140	0.000156
Fresh salmon	Hexachloro-benzene	0.003	0.0005*	PSD provis-ional	0.000005	0.000004	0.000010	0.000012
Potatoes	Maleic hydrazide	25 (median 1)	0.3	JMPR 1996	0.004	0.008	0.009	0.01
Courgette #	Buprofezin	0.07	0.01	JMPR 1999	0.000035	L/C	0.000168	0.000104

LC : low consumption (<0.1 g/day) or low number of consumers (<4)
* 'provisional tolerable daily intake' (this is used in the same way as the ADI)
# <60 consumers in one or more groups

Table D: Short term intake estimates

Crop	Pesticide	Residue (mg/kg)	ARfD (mg/kg bw/day)	Source	Intake (mg/kg bw/day)	
					Adult	toddler
Grapes (EU)	Dimethoate & omethoate (assume dimethoate)	0.64	0.03	ACP 2001	0.009	0.03
Mango (assessed as melon)	Omethoate (assume dimethoate)	0.16	0.03	ACP variability paper ACP 2 [249/97] 11 January 1997	0.0041	0.0167
Mango (assessed as melon)	azoxystrobin	0.06	0.1*	EC review 1997	0.0015	0.0063
Peach	Methamidophos	0.4	0.004	ACP variability paper ACP 2 [249/97] 11 January 1997	0.005	0.02
Peach	Methamidophos	0.09	0.004	ACP variability paper ACP 2 [249/97] 11 January 1997	0.0011	0.005
Grapes (special)	Chlorpyrifos	1.4	0.1	ACP 2000	0.019	0.0763
Grapes (special)	Parathion-methyl	0.1	0.03	ACP variability paper ACP 2 [249/97] 11 January 1997	0.0014	0.0054
Nectarines	Bromopropylate	0.1	0.2	ACP variability paper ACP 2 [249/97] 11 January 1997	0.0015	0.0072
Nectarines	Methamidophos	0.06	0.004	ACP variability paper ACP 2 [249/97] 11 January 1997	0.0009	0.0043
Nectarines	Acephate	0.1	0.03	ACP variability paper – ACP 2 [249/97] 11	0.0015	0.0072

Crop	Pesticide	Residue (mg/kg)	ARfD (mg/kg bw/day)	Source	Intake (mg/kg bw/day)	
					Adult	toddler
				January 1997		
Nectarines	Fenpropimorph	0.06	0.009**	PSD proposed in AchE review 2002 (not yet considered by ACP)	0.0009	0.0043
Soft citrus	Imazalil	6.5	0.03*	JMPR 2001	0.07	0.3
Soft citrus	Tetradifon	0.1	0.0025*	Internal PSD based on IPCS EHC67 1986	0.0001	0.0005
Celery	Iprodione	0.06	0.06*	JMPR	0.0003	0.0006
Celery	Cypermethrin	0.5	0.02	EC review 2001	0.002	0.005
Celery	diazinon	0.5	0.03	JMPR 2001	0.002	0.005
Celery	Dichlofluanid	0.09	0.3*	JMPR 1983	0.0004	0.0009
Celery	Cyhalothrin	0.03	0.002*	JMPR 2000 (JECFA evaluation)	0.0001	0.0003
Celery	Chlorpropham	0.2	0.03	JMPR 2000	0.0009	0.002
Star fruit	Chlorpyrifos	0.08	0.1	ACP 2000	0.0009	0.0009
Potatoes	Chlorpropham	6.6	0.03	JMPR 2000	0.17	0.69
Potatoes	Oxadixyl	0.2	0.11*	ACP 1995	0.005	0.02
New potatoes (boiled)	Aldicarb (standard risk assessment)	27	0.003	JMPR 1995	0.04	0.02
Tomatoes	Tetradifon	0.06	0.0025*	Internal PSD based on IPCS EHC67 1986	0.0006	0.003
Tomatoes	Bifenthrin	0.04	0.01*	JMPR 1992	0.0004	0.002
Tomatoes	Bupirimate	0.2	0.01*	PSD provisional based on old data	0.002	0.008
Tomatoes	Fenhexamid	0.2	0.2*	ANNEX I	0.002	0.008
Tomatoes	Furalaxyl	0.02	0.0009*	PSD provisional	0.0002	0.0008
Tomatoes	Oxadixyl	0.1	0.11*	ACP 1995	0.001	0.004
Tomatoes	Pyrimethanil	0.3	0.2*	ACP 1995	0.003	0.01
Lettuce	Azoxystrobin	0.9	0.1*	EC review 1997	0.006	0.008
Lettuce	Inorganic bromide	164	0.9	JMPR 1998	1.1	1.4
Lettuce	Propyzamide	0.02	0.03*	EC review 1999	0.0001	0.0002
Lettuce	Imidacloprid	0.07	0.4	JMPR 2001	0.0005	0.0006
Grapefruit	Tetradifon	0.1	0.0025*	Internal PSD based on IPCS EHC67 1986	0.002	0.008
Mushrooms	Gamma-HCH	0.1	0.01	EC Review 1999	0.0002	0.0003
Mushrooms	Dimethoate	2.1	0.03	ACP 2001	0.005	0.007

Crop	Pesticide	Residue (mg/kg)	ARfD (mg/kg bw/day)	Source	Intake (mg/kg bw/day)	
					Adult	toddler
Strawberries	Bupirimate	0.8	0.01*	PSD provisional, based on old data	0.002	0.006
Strawberries	Dicofol	0.2	0.1	PSD provisional based on ACP 1995	0.0006	0.002
Strawberries	Fenhexamid	4.3	0.2*	Annex I	0.01	0.03
Strawberries	Kresoxim-methyl	0.09	0.4*	JMPR 1998	0.0003	0.0007
Strawberries	Pyrimethanil	0.9	0.2*	ACP 1995	0.003	0.007
Strawberries	Cyprodinil	0.1	0.03*	ACP 1997	0.0003	0.0008
Strawberries	Penconazole	0.2	0.03*	JMPR 1992	0.0006	0.002
Strawberries	Trifloxystrobin	0.06	0.1*	EC Review process (provisional)	0.0002	0.0005
Bran	Chlormequat	6.3	0.05	JMPR 1999	0.0072	0.0196
Bran	Etrimfos	0.2	0.003*	JMPR 1986	0.0002	0.0006
Bran	Glyphosate	1.8	0.25	EU review/ Annex I	0.0021	0.0056
Bran	Pirimiphos-methyl	1.5	0.15	ACP 2002	0.0017	0.0047
Infant food	Chlorpropham	0.03	0.03	JMPR 2000	-	0.0002
Infant food	ETU	0.01	0.05	EU provisional	-	0.0001
Courgettes	Oxamyl	0.1	0.006	ACP 2001	0.0012	0.0029
Apples	Bupirimate	0.07	0.01*	PSD provisional	0.0009	0.0041
Apples	Bromopropylate	0.4	0.2	PSD provisional	0.0046	0.0219
Apples	Parathion-methyl	0.05	0.03	EU review proposal	0.0007	0.0030

* ADI used instead of ARfD (the ARfD should not be lower than the ADI).
** proposed value

b. Risk assessments for processed commodities where there is no MRL

Details of the MRLs for the likely components for the raw commodities, where residues were found in processed commodities, are detailed below. It is not necessary to consider processing factors for all the commodity/pesticide combinations and back calculate to the likely residues in the raw commodity and compare against the MRL, as the levels found are well below the MRLs for the raw commodities. The results are presented in Table E.

Table E: MRL'S FOR PROCESSED COMMODITIES

Commodity	Pesticide	Likely raw commodity	MRL (mg/kg)
Processed potato products	chlorpropham levels found 0.3 – 1.5 mg/kg	Potatoes (ware)	No MRL
Processed potato products	maleic hydrazide levels found 1.3 – 11 mg/kg	Potatoes (ware)	50
Processed potato products	oxadixyl level found 0.03 mg/kg	Potatoes (ware)	No MRL
Processed potato products	thiabendazole levels found0.07 to 0.4 mg/kg	Potatoes (ware)	5 (to 1 July 2001); 15 (there-after)
Pizzas	chlormequat levels found 0.06 mg/kg	Wheat	2 mg/kg
Savoury bread	chlormequat levels found 0.05 to 0.09 mg/kg	Wheat	2 mg/kg
Savoury bread	glyphosate levels found 0.1 to 0.2 mg/kg	Wheat	5 mg/kg
Savoury bread	pirimiphos-methyl levels found 0.07 mg/kg	Wheat	5 mg/kg
Ordinary bread	chlormequat levels found 0.05 to 0.2 mg/kg	Wheat	2 mg/kg
Ordinary bread	glyphosate levels found 0.1 to 0.2 mg/kg	Wheat	5 mg/kg

MRL EXCEEDANCES AND NON-APPROVED UK USES IN THE FOURTH QUARTER OF THE 2001 SURVEILLANCE PROGRAMME

TABLE H: MRL EXCEEDANCES IN ROUTINE SURVEILLANCE

PRC SAMPLE ID	COMMODITY	COUNTRY OF ORIGIN	PESTICIDE DETECTED	RESIDUE DETECTED (mg/kg)	MRL (mg/kg)
	FRUIT AND VEGETABLES				
3752/2001*****	celery	UK	iprodione	0.06	0.02 (EC)
5230/2001	celery	Spain	cypermethrin diazinon	0.5 0.5	0.05 (EC) 0.02 (EC)
0147/2001	celery	Spain	cypermethrin	0.07	0.05 (EC)
1645/2001	grapes (special survey)	unknown	chlorpyrifos	1.4	0.5 (EC)
3428/2001	grapes (special survey)	Spain	chlorpyrifos	0.6	0.5 (EC)
1393/2001	lettuce	UK	inorganic bromide	164	100 (Codex)
3431/2001*****	lettuce	UK	azoxystrobin	0.9	0.05 (EC)
5640/2001	mango	Brazil	azoxystrobin	0.06	0.05 (EC)
3282/2001*****	mushrooms	UK	chlormequat	0.4	0.05 (EC)
3033/2001	nectarines	Italy	methamidophos	0.06	0.05 (EC)
1065/2001	peaches	France	methamidophos	0.4	0.05 (EC)
2780/2001	peaches	France	methamidophos	0.09	0.05 (EC)
5491/2001	new potatoes	France	maleic hydrazide	25	1 (EC)
5591/2001	new potatoes	UK	maleic hydrazide	5.8	1 (EC)
2623/2001	new potatoes	UK	aldicarb	0.6	0.5 (EC)
4018/2001	soft citrus	Argentina	imazalil	6.5	5 (EC)
3085/2001	star fruit (carambola)	unknown	chlorpyrifos	0.08	0.05 (EC)
4149/2001	star fruit (carambola)	Malaysia	chlorpyrifos	0.08	0.05 (EC)
2035/2001	star fruit (carambola)	Malaysia	chlorpyrifos	0.08	0.05 (EC)
1815/2001*****	strawberries	UK	dicofol	0.2	0.02 (EC)
0100/2001	strawberries	Israel	penconazole	0.2	0.1 (Codex)
4134/2001	strawberries	UK	kresoxim-methyl	0.09	0.05 (EC)
1814/2001*	strawberries	UK	dicofol	0.2	0.02 (EC)

*****These results are also residues of pesticides not approved for use on these commodities in the UK, at the time of purchase.

TABLE I: UK NON-APPROVED USES IN ROUTINE SURVEILLANCE

PRC SAMPLE ID	COMMODITY	COUNTRY OF ORIGIN	PESTICIDE DETECTED	RESIDUE DETECTED (mg/kg)	MRL (mg/kg)
	FRUIT AND VEGETABLES				
4753/2001	celery	UK	iprodione	0.02	0.02 (EC)
3752/2001*****	celery	UK	iprodione	0.06	0.02 (EC)
0063/2001	lettuce	UK	acephate methamidophos procymidone	0.04 0.02 0.1	1 (EC) 0.2 (EC) 5 (EC)
3431/2001*****	lettuce	UK	azoxystrobin	0.9	0.05 (EC)
5337/2001	mushrooms	UK	chlormequat	0.2	10 (EC)
1046/2001	mushrooms	UK	omethoate	0.2	0.2 (UK)
3282/2001*****	mushrooms	UK	chlormequat	0.4	0.05 (EC)
1815/2001*****	strawberries	UK	dicofol	0.2	0.02 (EC)
1814/2001*	strawberries	UK	dicofol	0.2	0.02 (EC)

NB: EC and UK MRLs are statutory MRLs included in the Pesticides (Maximum Residue Levels in Crops, Food and Feeding Stuffs) (England and Wales) Regulations 1999, as amended.

Codex = non-statutory MRL established by the Codex Alimentarius Commission.

All regulations quoted are those which applied at the time of sampling.

***** These results are also residues of pesticides exceeding their MRLs.

BRAND NAMES

Annex 1 attached shows the brand name information for each sample analysed in the surveys (surveillance only) with details of the levels of residues detected. Results shown in green represent exceedances of the statutory MRL. Results shown in blue represent UK non-approved uses found in the surveys considered in this report. Organic products found to contain residues are denoted by ? in the brand name annex.

Where residues have been found in produce exceeding the MRL or containing a non-approved pesticide or claiming to be organic, the respective retail outlets have been notified of the results and have been invited to respond. Responses received are included in Appendix 1.

BRAND NAME POLICY

The Brand Naming Policy

Ministers have decided that brand name information should be published as part of the Government food chemical surveillance programme. Brand names have been published for most pesticide residue surveys since 1998. This policy was reviewed in 2000/1 where Ministers agreed to the continuation of this policy.

Presentation of the Information

Brand name information is set out in full in the annex to this quarterly report. The sample identification numbers cross-refer the annex to the tables in the main report. Results involving exceedances of MRLs or (where UK produce is concerned) residues of non-approved pesticides are shown in bold.

Certain samples are excluded from the release of brand name information. These include samples taken as part of any pesticide residues enforcement programme and those taken as part of surveys to study individual people/farms.

There is no ready definition of what constitutes a brand in all cases. For clearly branded produce like breakfast cereals or biscuits the “brand owner” is shown. In the case of “own brand” goods this may be one of the multiple retailers. For fruit and vegetables the retailer is generally shown. For meat, milk and most other animal products the retailer is also generally shown. Finally, for all commodities the country of origin is shown where this was displayed either on the produce or in the store.

In the case of exceedances of MRLs or the presence of non-approved pesticides the brand owner/retailer/grower is notified of the result in advance of publication

of the report and given the opportunity to comment within four weeks. The comments provided are reproduced in Appendix 1.

Interpretation of the Brand Naming Information

The information on brand names should be seen in an appropriate context. The programme is not designed to generate statistically valid information on residues in particular crops. This would require a much larger number of samples to be collected which would either substantially increase costs or greatly reduce the range of different foods that could be sampled in any one year. However, efforts are made to collect samples from a variety of outlets in a range of locations, particularly over a period of years. The programme should therefore generate information on the typical residues profile of particular types of produce and on major trends in the incidence and levels of pesticides.

In approaching the inclusion of brand names the PRC has sought to make the samples taken for its surveys as representative of the market as reasonably possible. Market research information has been used to establish market shares with a view to structuring surveys to collect samples of each particular brand broadly proportionate to its market share. However, there are obvious constraints to this approach. It would not for instance be worthwhile to increase substantially the number of samples for a minor commodity simply to ensure that each brand was sampled. The approach has had to be more to ensure representative samples across a sector, like fruit and vegetables, than to seek representative samples for each brand for each commodity. **This unavoidably means that results from an individual survey cannot be taken as a fair representation of the residues status of any particular brand.**

A particular issue arises in relation to the country of origin of fruit and vegetables. The origins included in the reports are those recorded either on the produce or in the store. However, the fresh produce trade has pointed out that it is not uncommon for mixing to occur on shop shelves. The PRC has responded by increasing the proportion of pre-packed goods sampled. However, pre-packed samples are not available for some produce in some stores and it could also introduce bias to surveys if loose produce were not sampled. Loose produce is therefore sampled but the origin of the sample should be interpreted with a degree of caution.

Current Developments

Further steps have been taken to address the question of possible mixing of produce. Samples of some commodities from major retailers are being taken from unopened boxes in store-rooms rather than the shop front. This should remove the risk of origins being confused by mixing. Additionally, some commodities are being sampled at both wholesale and retail level, again in the former case to reduce the risk of confusion over origin. The PRC will be

considering these developments as part of the consultation exercise later this year which will review the surveillance programme.

QUARTER 1 2002 REPORT

It is planned that the PRC report for Quarter 1 of 2002, will cover surveys of:

Butter
Carrot (special)
Lettuce
Milk
Mince
Sausages
Sweet potatoes
Tomatoes (special)
Yams

GLOSSARY OF COMMONLY USED TERMS OR ABBREVIATIONS

Acaricide: a type of insecticide used specifically to control spider pests.

Acceptable daily intake (ADI): This is the amount of a chemical which can be consumed every day for a lifetime in the practical certainty, on the basis of all known facts, that no harm will result. It is expressed in milligrams of the chemical per kilogram body weight of the consumer. The starting point for the derivation of the ADI is usually the 'no observed adverse effect level' (NOAEL) that has been observed in animal studies for toxicity. This is then divided by an uncertainty factor (most often 100) to allow for the possibility that animals may be less sensitive than humans and also to account for possible variation in sensitivity between individuals. The studies from which NOAELs and hence ADIs are derived take into account any impurities in the pesticide active substance as manufactured, and also any toxic breakdown products of the pesticide.

Acute reference dose (ARfD): This is intended to define (on the basis of all known facts at the time of the evaluation) an estimate of a chemical substance in food (or drinking water), expressed on a bodyweight 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 [JMPR].

Good agricultural practice in the use of pesticides (GAP): The nationally authorised safe uses of pesticides under conditions necessary for effective and reliable pest control (the way products should be used according to the statutory conditions of approval which are stated on the label). GAP encompasses a range of pesticide applications up to the highest authorised rates of use, applied in a manner which leaves a residue which is the smallest practicable. Authorised safe uses are determined at the national level and include nationally registered recommended uses, which take into account public and occupational health and environmental safety considerations. Actual conditions include any stage in the production, storage, transport, distribution and processing of food commodities and animal feed.

Analyte: a pesticide itself or a break-down product from a pesticide when it is degraded, or metabolised.

'Critical GAP': Sometimes the GAP is referred to as the 'critical' GAP. This is the conditions of use which give the highest residue, in the edible part of the crop.

Cryogenic milling: Processing of commodities at very low temperatures can be achieved by milling/grinding pre-frozen samples in the presence of dry ice, a procedure known as 'cryogenic milling'.

High level consumer: A term used in UK risk assessment calculations to describe the amount of food consumed by a person. Rather than using average values, the PRC uses the 97.5th percentile value which is generally about three times the average amount consumed. This takes account of different eating patterns that may occur throughout the population.

Limit of determination (LOD): The limit of determination is the lowest concentration of a pesticide residue or contaminant that can be identified and quantitatively measured in a specified food, agricultural commodity or animal feed with an acceptable degree of certainty by the method of analysis.

Maximum residue level (MRL): The maximum concentration of a pesticide residue (expressed as mg/kg) legally permitted in or on food commodities and animal feeds. MRLs are based on good agricultural practice data and residues in foods derived from commodities that comply with the respective MRLs are intended to be toxicologically acceptable. **MRLs are not in themselves 'safety limits'.**

MRLs are intended primarily as a check that GAP is being followed and to assist international trade in produce treated with pesticides. MRLs are not safety limits, and exposure to residues in excess of an MRL does not automatically imply a hazard to health.

Website link: www.pesticides.gov.uk/legislation/MRLs_Legislation/mrl.htm

Maximum Residue Limits (CODEX): In cases where there are no UK or EC MRLs, the acceptability of residues may be judged against Codex Maximum Residue Limits. Although not embodied in UK statute, Codex MRLs are taken as presumptive standards. These Maximum Residue Limits give an indication of the likely highest residue that should occur in edible crops. This is based on world wide uses and the residues trials data to support those uses, at the time of evaluation (date of setting the Maximum Residue Limits is specified and thus the Maximum Residue Limit applicable up to that year, but will not take into account subsequent approved uses.)

There are occasions where the MRL that has been set may not reflect UK Good Agricultural Practice (e.g. the Codex MRLs for dithiocarbamates and propamocarb on lettuce). In such circumstances it is possible to exceed the Codex MRL through a UK approved use. This factor needs to be taken into account when assessing results.

Maximum Residue Levels set at the LOD: For some pesticides and commodities, insufficient trials data are available on which to set a maximum residue level. In these cases, the MRL may be set at a default level, i.e. at the limit of determination (LOD) where analytical methods can reasonably detect the

presence of the pesticide. **These MRLs are <u>not</u> based on Good Agricultural Practice (GAP).**
MRL exceedances: when a residue is found at a level higher than that set for the MRL.

MRL exceedances and relationship with the Acceptable Daily Intake (ADI): Before permitting any use of a pesticide, a detailed assessment is made to ensure that residues in foods derived from commodities comply with MRLs and will not give rise to unacceptable risks to consumers. MRLs do take account of consumer safety aspects and, in effect, are set at levels below safety limits. However, MRLs must not be confused with safety limits, which are expressed in terms of the acceptable daily intake (ADI) of a particular pesticide residue from all sources. The ADI (expressed as mg/kg bw/day) is the amount of chemical that can be consumed every day of an individual's entire lifetime in the practical certainty, on the basis of all known facts, that no harm will result. See **ADI** for further information.

Whenever unexpectedly high or unusual residues occur during monitoring, the risk to consumers, from exposure to residues at the highest levels found, is assessed by comparison of predicted intakes with the ADI or ARfD as appropriate.

No MRL: For certain pesticides, an MRL may not have been set. (See section on 'Dietary intake implications' for risk assessments for pesticides which do not have an MRL).

Metabolite: a degradation product from a pesticide when it is metabolised.

NEDI: National estimate of dietary intake

NESTI: National estimate of short term intake

No observed effect level (NOEL): The highest level of continual exposure to a chemical which causes no significant adverse effect on morphology, biochemistry, functional capacity, growth, development or life span of individuals of the target species which may be animal or human.

Permitted Level (PL): The permitted levels (expressed as mg/kg), in specific commodities, of some substances which can be classified as pesticides but are controlled under the Miscellaneous Food Additives Regulations 1995 (S.I. 1995 No. 3187).

Pesticide: A pesticide is any substance, preparation or organism prepared or used for destroying any pest. The majority of pesticides sought by the PRC in its monitoring are those used to control pests in agricultural crops, although non-

agricultural products may be included where there is a specific reason for doing so, e.g. where there are implications in terms of possible intakes of residues.

Probabilistic modelling: the standard methods for calculating consumer exposure are based on point estimates that use single values for consumption and residue levels in the crop. Whilst these use realistic consumption data from UK surveys and residue levels from actual trials, they will tend to overestimate intake in most circumstances. This is due to the assumptions used, for example, fruit and vegetables would contain high levels of residue in an individual unit and that these would be consumed by high level consumers i.e. at the 97.5th percentile. They do not take into account the possible range of residue levels and consumption distributions that may occur in reality. These possible combinations of residues and consumption levels can be taken into account using modelling/simulation techniques to produce probability distributions of residue intake levels to indicate the range of consumer intakes, presented as a probabilistic assessment of consumer exposure, rather than the single point estimate approach. Application of these techniques is a relatively new development in consumer risk assessment that has mainly been used in the refinement of short term exposure assessments.

Provisional tolerable daily intake: this is used in the same way as an ADI.

Rapid alert: The European Commission operates an EU Rapid Alert System for Food, which was set up in 1992. This provides the competent authorities in the Member States of the European Union with the means of notifying cases where high residues of pesticides have been found in imported samples. Since its introduction this system has proved a successful method for disseminating information between Members States allowing swift action where necessary.

Relationship between GAP and MRLs: The MRL can be defined as the maximum concentration of a pesticide residue (expressed as mg/kg) likely to occur in or on food commodities and animal feeds, after the use of the pesticide according to the GAP.

Reporting limit: the reporting limit is the lowest calibrated level employed during analysis to detect residues. The reporting limit may vary slightly from laboratory to laboratory depending on the equipment available and operating procedures used.

'None were detected above the set RL': This term is used in the Brand Name Annex, where no residues were found above their reporting limit.

Residue: Any pesticide found in a sample, including any specified derivatives such as degradation and conversion products, metabolites and impurities which are considered to be of toxicological significance.

Risk assessment: A risk assessment is carried out when residues are found in foods to determine whether, at the levels found, they present a concern for consumer health or not. See section on 'Dietary intake implications' for more information on risk assessments carried out in this report. Consumer risk assessments are routinely assessed as part of the approval process for pesticides and is based on residue trials. Approval of a pesticide is only recommended when the consumer risk is acceptable.

Ware: ware potatoes, sometimes referred to as maincrop potatoes, are usually harvested between August and November.