The Expert Committee on Pesticide Residues in Food (PRiF)

Annual Report 2017

PRiF
Pesticide Residues in Food

The Expert Committee on Pesticide Residues in Food oversees a programme that checks food and drink in the UK for traces of pesticide residues.

- We are appointed by Defra to advise Defra, the Northern Ireland Executive, the Scottish Government, the Welsh Government, the Health and Safety Executive and the Food Standards Agency on a monitoring programme that checks food and drink in the UK for traces of pesticide residues.
- One of the purposes of the programme is to check whether residues found in food and drink are above the maximum residue levels (MRLs) set by law.
- When we find residues we assess whether the levels found are likely to impact on human health.
- We assess whether residues might be of concern to particular groups of consumers such as babies, toddlers and the elderly.
- Where more than one pesticide is found with similar modes of action, we assess if the impact of the sum of the residues is of concern.
- When problems are found we take action including focused testing and, if necessary, advise the regulatory authority so that enforcement action can be taken.
- We act as a check on the regulatory regime.
- We review residues found in sampling for the School Fruit and Vegetable Scheme which provides children between four and six in local authority maintained schools in England with a free piece of fruit or vegetable a day.

The Expert Committee on Pesticide Residues in Food **does not:**

- advise on whether pesticides should be approved for use or withdrawn from the market;
- set government policy on pesticides;.
- take account of or access the impact of pesticides on the environment;
- promote the use of pesticides.

This is the seventh annual report from the Expert Committee on Pesticide Residues in Food. It summarises the results from monitoring samples collected throughout 2017 and our conclusions about those results. It also describes the work that is being carried out in 2018.

Details of all the samples we have collected and tested are available on data.gov.uk: https://data.gov.uk/dataset/pesticide-residues-in-food

If you have any comments about this report, please send them to prif@hse.gov.uk

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1. Chairman's introduction

Dear reader,

This is the seventh annual report from the Expert Committee on Pesticide Residues in Food (PRiF). The committee is made up entirely of independent members with a wide range of expertise.

Throughout 2017, PRiF have published quarterly reports on the results of the monitoring programme. We have also reported monthly on beans with pods, grapes, okra, potatoes and prepared fresh fruit as part of our rolling programme. All of these results have been published on our website. For 2017, we began to publish the results and sample details in an accessible, useable format on data.gov.uk. We also changed the look of our quarterly summary reports, so they are more user-friendly and easier to navigate. We would welcome any feedback on these changes.

In 2017, 3357 samples of food and drink from the UK supply chain were tested for pesticide residues. We tested for up to 376 pesticides in some of the commodities. The results showed us that 53% of the samples tested by the laboratory did not have any residues of the pesticides we tested for. The results also show that around 3% of the samples contained a residue above the MRL set by law. This report details all of these results and follow-up actions.

Part of the monitoring programme is targeted at foods where we expect to find residues. Our programme uses the latest technology for analysis, which is constantly improving; this means that each year we can look for more pesticides at lower levels. For these reasons we expect to see a rise in the number of samples with residues detected, including some over the MRL. HSE assess the risk to consumer health for every sample that contains a residue at any level. From the results of these assessments we can see that even where food contains a residue above the MRL, there is very rarely any risk to the health of people who have eaten the food.

For information about the monitoring programme, please look at our page on the gov.uk website:

www.gov.uk/government/collections/pesticide-residues-in-food-results-of-monitoring-programme

Please contact us if you have any comments: prif@hse.gov.uk

Yours sincerely

Paul Brantom

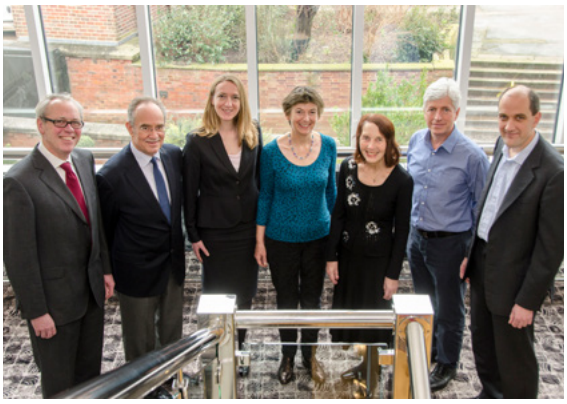
Dr Paul Brantom

Chairman
The Expert Committee on Pesticide Residues in Food

2. Executive summary

- 3357 samples of 38 different types of food were collected in 2017.
- 47% of these samples contained a residue.
- We tested for up to 376 pesticides in fruit and vegetables, 100 in animal products, 375 in starchy foods and grains, 365 in infant food and 371 in other groceries.
- All of the samples in which a residue was detected were checked by the Health and Safety Executive (HSE) for risk to the consumers by means of a risk assessment screening mechanism. We published results of 28 detailed risk assessments where we wanted to consider in more detail whether there was a concern for human health.
- We referred eight samples to the Food Standards Agency (FSA) as we had concerns about the potential risk to human health of people eating these foods. Where appropriate the FSA notified the Rapid Alert System for Food and Feed (RASFF) about these samples.
- We referred 17 samples of UK produce to HSE Enforcement as they contained residues of pesticides not approved for use in the UK on those crops. Where HSE could not identify an obvious reason for the residues they then investigated how these residues could have arisen.

3. About us



The pesticide residues surveillance programme monitors pesticide residues in food and drink in the UK supply chain. The term pesticide residue means the chemical trace of a pesticide which may be found in or on food. The agriculture and food industries use pesticides to help protect their crops from pests, including insects, weeds or fungal infections. The agriculture and food industries must comply with specific regulations.

We give advice on:

- setting up monitoring programmes for pesticide residues in UK food;
- how to collect and process samples;
- methods of analysing samples;
- how to assess the results.

We publish the monitoring results regularly on the gov.uk website, in an understandable way, and we aim to do this as quickly as possible without compromise of integrity.

The Expert Committee on Pesticide Residues in Food was formed in 2011, to carry on the work of the Pesticide Residues Committee (PRC), which ceased to operate in 2010.

Our members have been appointed by ministers from the Department for Environment Food and Rural Affairs (Defra), the Scottish Government, the National Assembly for Wales and Department of Agriculture, Environment and Rural Affairs for Northern Ireland.

We give advice on the monitoring programme to:

- ministers;
- the Chief Executive of the FSA;
- the Health and Safety Executive's Chemicals Regulation Division (CRD).

We meet four times a year and representatives from government departments attend our meetings as officials. HSE provides our administration. We open one of our business meetings to the public each year.

The bigger picture

People are concerned about health, the environment and how food is produced. Pesticides used in the incorrect way or in the wrong amounts can harm people, wildlife and the environment, so they must be handled with care. Pesticides can only be used in UK agriculture if they are used in line with the law and guidance controlling their use.

As regulating pesticides is a complicated area, there are a number of different organisations involved. On behalf of Defra and the other UK agricultural departments, the Health and Safety Executive authorises and controls pesticides for use in the UK, as well as monitoring pesticide residues in the UK food supply no matter where the food was produced. The Food Standards Agency has overall responsibility for food safety.

Most residues come from pesticides being used on crops. To work effectively, pesticides must be used in the correct amounts and at the right time. The amount of residue in a food is dependent on:

- how much pesticide was used;
- when it was applied in relation to harvest date;
- how it is metabolised by plants and animals, and;
- how it breaks down in the environment.

In addition to this, residues can sometimes be due to contamination (small amounts of pesticide that remain in the environment after legitimate use). Due to significant technical improvements in laboratory analysis, we now have the capability to detect very low levels of residues and so it is possible that, as methods become more sensitive, we may find more residues.

Our work and open reporting system has encouraged producers and retailers to be responsible about their use of pesticides and how they supply food to people. We are transparent about our work and publish the results, including brand names, where samples were obtained and where possible who produced them.

The Expert Committee on Pesticides (ECP)

The Expert Committee on Pesticides (ECP) is responsible in the UK for giving advice on using and handling pesticides and for considering incidents related to the effect pesticides have on wildlife and pets. The ECP assesses pesticides before they can be used and sold in the UK. It advises the government if a pesticide should be approved, what crops it may be used on, how it may be used and how much can be used on a crop. It takes account of any new information about an approved pesticide to see if it should be used at a reduced rate, under different conditions or withdrawn from sale. We let the ECP know if we see something in our results that falls inside their remit.

Maximum Residue Levels (MRLs)

MRLs are set in law at the highest level of pesticide that the relevant regulatory body would expect to find in that crop when it has been treated in line with good agricultural practise (GAP). When MRLs are set, effects of the residue on human health are also considered. The MRLs are set at a level where consumption of food containing that residue should not cause harm to consumers.

If a food has a higher level of residue than the MRL, it does not automatically mean that the food is not safe to eat. A residue above the MRL may show that the farmer has not used the pesticide properly. Some pesticides may be permitted for use in the country of export but not be permitted for use in the EU and hence the MRL may be set at the lowest level that official laboratories can normally detect. This is known as the limit of determination (LOD), an LOD MRL is indicated by an asterisk after the level (i.e. 0.01* mg/kg).

The Food Standards Agency (FSA) update

The main objective of the FSA in carrying out its functions is to protect public health from risk which may arise in connection with the consumption of food (including risks caused by the way in which it is produced or supplied) and otherwise to protect the interest of consumers in relation to food. The FSA attends PRiF meetings as an assessor and works closely with us, and with HSE, on pesticide residues issues.

The FSA has enforcement responsibility at the border for pesticides in food coming into the UK from outside the EU. This is normally carried out on behalf of the FSA by Port Health Authorities. In 2017, only four incoming consignments were found with levels of residue that could have been a potential risk to health. Of these, two were okra from India, although the residues they contained were non-compliant, they were of different pesticides so did not indicate a repeated problem. The third consignment was strawberries from Egypt and the fourth was peppers from the Dominican Republic. The first three consignments were rejected at the port and the fourth was seized for destruction.

4. The monitoring programme

We are interested in whether pesticides meet legal trading levels and if there is any risk to people's health.

Collecting and testing samples

The size of the sample and the number of individual units of a food within each sample is set down in regulation for example, for apples the sample must be made up of at least 10 apples and weigh at least 1 kilogram.

We send samples to the following laboratories to be tested:

Agri-Food and Bioscience Institute (AFBI) – Belfast;

Fera Science Ltd – York;

Science and Advice for Scottish Agriculture (SASA) – Edinburgh.

Residues tested for

We test for pesticides that are expected to be found in those products as well as other pesticides in a wider analytical suite.

Over the last 15 years the number of pesticides we test for has risen. The increase is consistent with the current capability of most laboratories which test food for pesticide residues.

The choice of pesticides tested for in a survey depends on:

- which pesticides have been found before;
- what we know is being used to grow specific foods, (that is, which pesticides are approved for certain crops);
- what we know about pesticides used in the UK and other countries;
- what we know about pesticides being found in tests in other countries;
- the risk residues of that pesticide may present;
- the maximum results levels set in law.

Why we chose certain foods

There is a wide range of foods available in the UK throughout the year. To make the most of resources and make sure we test a wide range of food, the programme changes from year to year.

When we choose the foods to test in a year, we take account of many factors. Some foods are so common in our diets that even if PRiF normally finds few or no residues, it is right to carry on checking them. Although there have been no recent health concerns we continue to monitor staples like milk and bread because of their role in our diet.

We group the foods into four categories:

- fruit and vegetables;
- animal products;
- starchy food and grains;
- infant food and other groceries.

Other foods are less commonly consumed but are important in the diet of some groups of people; speciality fruit and vegetables are a good example. We check these especially to protect those who consume these foods most frequently or in the greatest amount. Some foods that are not staples in our diets are still included most years because we regularly find residues in them that are not compliant with the MRLs.

We also keep an eye out for new trends in diets, like the increased sale of pots of prepared fruit in recent years. We bear in mind different shopping habits in our sampling, like buying from street markets, greengrocers or supermarkets.

We also take account of monitoring data from other countries as well as information from the Rapid Alert System for Food and Feed (RASFF). EU member states use the RASFF to share notifications of foods which could be a risk to human health.

Each year we contribute to Europe-wide surveys of main food groups collected to an agreed timetable. In 2017, carrot, cauliflower, dried beans, kiwi fruit, lamb, onion, oranges, pears, potatoes, poultry, rice and rye formed part of this larger survey. These results are then shared with the European Food Safety Authority (EFSA) who compile and publish a single annual report.

Each year we publish our proposed list of foods to be sampled. In 2017 we developed with HSE a Monitoring Matrix ranking tool which helps determine the priority of the relative surveys. We hope this will enable a more objective approach: https://www.gov.uk/government/groups/expert-committee-on-pesticide-residues-in-food-prif#minutes-and-papers

We publish detailed results from the programme every three months. From 2017 we changed the way our reports were published to make them easier to navigate and more user friendly for those viewing them.

The reports are now published in two parts. The first is the Quarterly Summary report which details the findings, risk assessments that were carried out and any comments from the committee. This part of the report is published on gov.uk: https://www.gov.uk/government/collections/pesticide-residues-in-food-results-of-monitoring-programme#quarterly-reports

The other part of the report provides the sample details such as brand name information, what was detected in each sample, and what residues were sought and not found in each survey. This part of the report is published in an accessible format on data.gov.uk: https://data.gov.uk/dataset/pesticide-residues-in-food

Report	When samples are collected	When report was published
Q1 2017	January to March 2017	November 2017
Q2 2017	Up to June 2017	December 2017
Q3 2017	Up to September 2017	March 2018
Q4 2017	Up to December 2017	June 2018

You can also get copies of these reports from our secretariat:

Email: prif@hse.gov.uk

Food and drink being monitored in 2018

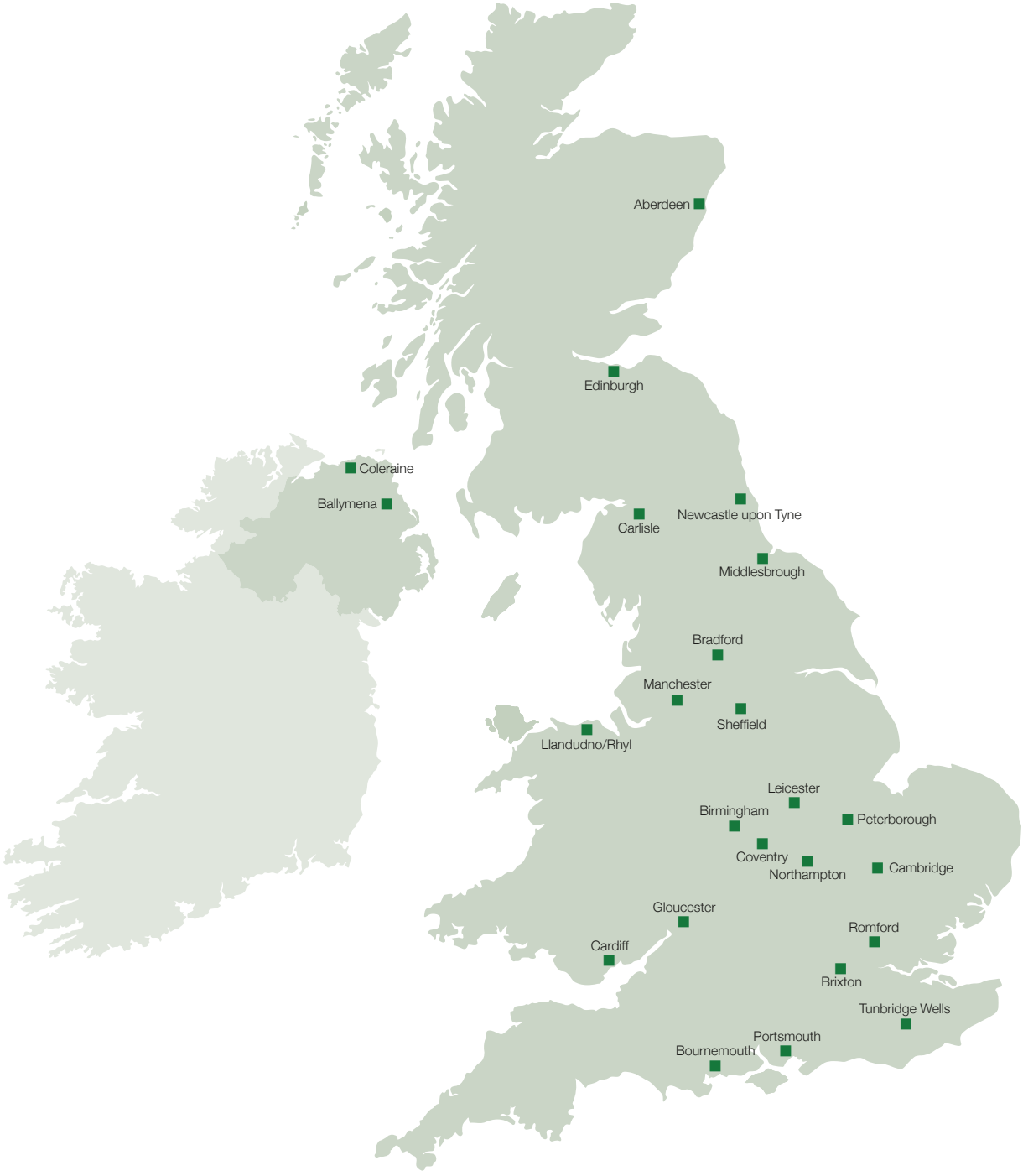
The 2018 programme started in January 2018.

Animal fats	Cheese (soft)	Grapes	Pears
Apples	Chinese cabbage	Infant food (cereal-based)	Peas
Aubergine	Cream	Lentils	Pepper
Banana	Curry leaves/vine leaves	Lettuce	Pineapple
Beans with pods	Eggs	Melon	Potato
Beef	Fish (white)	Milk (cows, goats and ewes)	Soft citrus
Beer	Frozen vegetables	Mushrooms (speciality)	Speciality vegetables
Berries	Game	Mushrooms	Wheat
Bread	Ginger	Okra	
Broccoli	Grapefruit	Olive oil	

HSE is planning the programme for 2019. A proposed list of commodities for 2019 will be published for comments as a paper of a future PRiF meeting.

5. Where the samples collected in 2017

Each year, samples are collected from different places throughout the UK, two towns or cities are chosen from each government region. In 2017, we bought over 2697 samples from retail outlets in 24 towns or cities in the UK. Government inspectors collected around 660 samples from places such as wholesalers, ports, supermarket distribution depots and processor factories. This allows samples to be collected from non-retail sources, making the surveys more representative of the food chain.



6. Foods tested in 2017

As some foods are available at different times throughout the year from different parts of the world, we may collect samples of these foods over three, six, nine or twelve months. We sometimes report results of tests every six months rather than every three months. We do this when there are only a small number of samples in a survey or when we do not expect there to be many residues of interest in the results.

We publish detailed results from the programme every three months. Reports for 2017 are available on data.gov.uk: https://data.gov.uk/dataset/pesticide-residues-in-food

Details of the foods reported on in each quarter are below.

Q1 report (January to March 2017, published November 2017)	**Q2** report (up to June 2017, published December 2017)	**Q3** report (up to September 2017, published March 2018)	**Q4** report (up to December 2017, published June 2018)
Apples	Apples	Apples	Apples
Beans with pods	Beans with pods	Beans with pods	Baked beans
Carrots	Carrots	Bread	Beans with pods
Cauliflower	Cauliflower	Carrots	Bread
Cucumber	Cheese (hard)	Cauliflower	Carrots
Fish (oily)	Cherries	Cheese (hard)	Cauliflower
Grapes	Cucumber	Cherries	Cheese (hard)
Kiwi fruit	Fish (oily)	Cucumber	Cucumber
Lamb	Grapes	Fish (oily)	Fish (oily)
Lettuce	Kiwi fruit	Grapes	Grapes
Milk	Lamb	Infant formula	Kiwi fruit
Okra	Lemons and limes	Kiwi fruit	Lamb
Onions	Lettuce	Lamb	Lemons and limes
Oranges	Milk	Lettuce	Lettuce
Pears	Okra	Milk	Milk
Peppers	Onions	Okra	Okra
Potatoes	Oranges	Onions	Onions
Poultry meat	Pears	Oranges	Oranges
Prepared fresh fruit	Peppers	Pears	Parsnips
Rice	Potatoes	Peppers	Pears
Speciality beans (dried)	Poultry meat	Potatoes	Peppers
	Poultry meat (processed)	Poultry meat	Potatoes
	Prepared fresh fruit	Prepared fresh fruit	Poultry meat
	Raspberries	Raspberries	Poultry meat (processed)
	Rice	Rice	Prepared fresh fruit
	Shellfish	Shellfish	Rice
	Soya milk	Soya products	Rye flour
	Speciality beans (dried)	Speciality beans (dried)	Rye grain
	Speciality fruit	Speciality fruit	Speciality beans (dried)
	Spring greens and kale	Spring greens and kale	Speciality fruit
		Yoghurt	

7. Results from the 2017 programme

In 2017, we tested 3357 samples. We tested each sample for many different pesticides. In total we tested around 961,313 food and pesticide combinations.

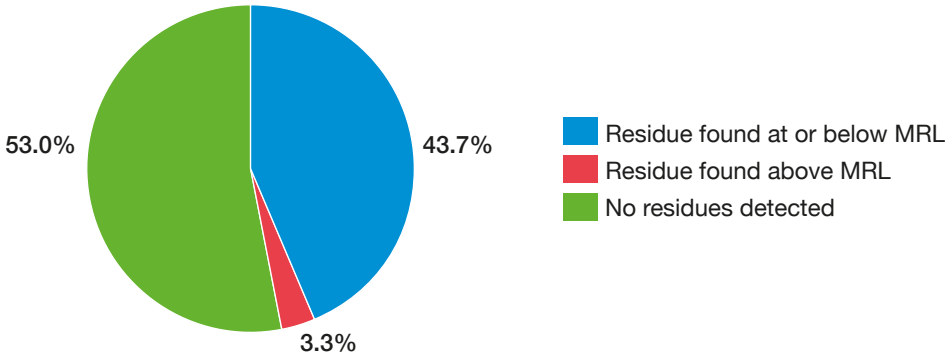
Of the pesticides we looked for we found that:

- 53% of samples contained none of the pesticides we looked for;
- 43.7% of samples contained a residue at or below the MRL;
- 3.3% of samples contained a residue over the MRL.

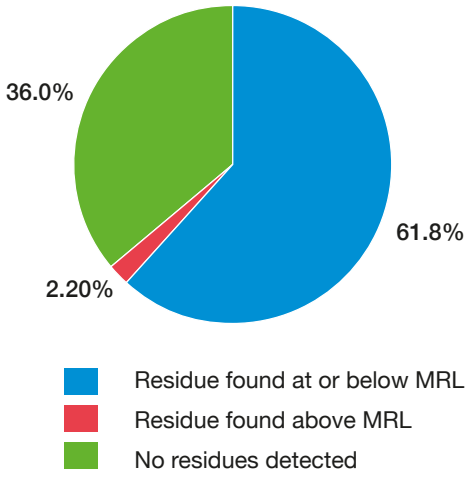
The monitoring programme looks at those foods in which we expect to find residues; because of this we cannot say that the results represent the UK food supply as a whole.

For fresh fruit and vegetables the country of origin on the label is where they were grown, but for other foods samples labelled as being from the UK may not have been **grown** in the country. The country of origin on a food label can be where the raw ingredient was produced, where the food was made, where it was packed from bulk for retail sale or it could be the home of the brand owners. For example tinned tomatoes can be labelled as being from the UK, but the tomatoes in the tin could have been grown in Italy or China and then canned in the UK.

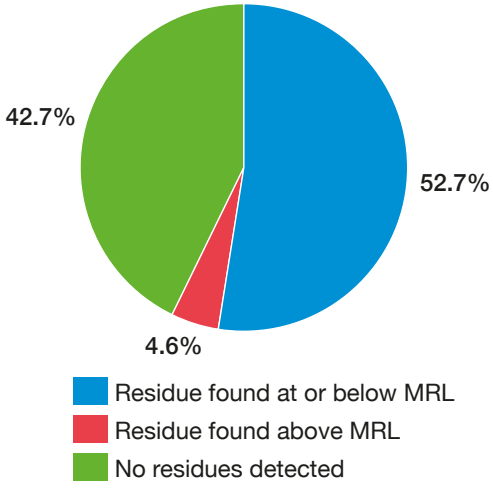
Overall results for 2017



Food from UK – 1807 samples



Food from outside the UK – 1550 samples

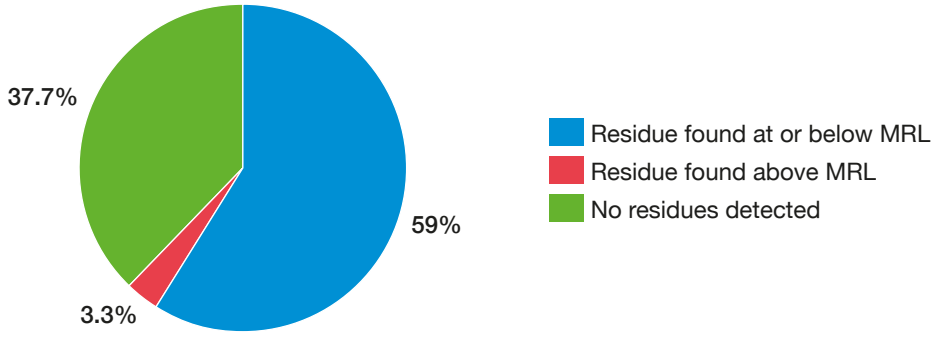


8. Fruit and vegetable results

We tested 1883 samples for up to 376 pesticides and carried out around 663,789 food and pesticide tests.

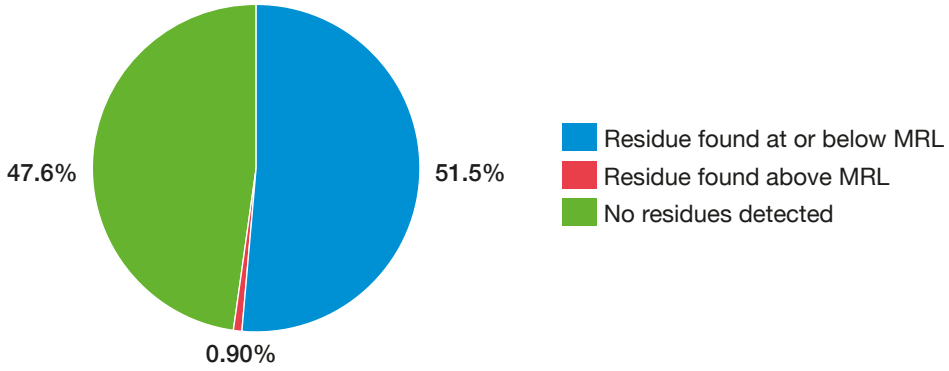
We found residues in 1174 of those samples (62.3%). Of those samples, 63 (3.3%) contained a residue above the MRL.

Fruit & vegetables – 1883 samples



We tested 699 samples labelled as UK fruit and vegetables. We found residues in 366 (52.4%) of those samples, and 6 samples (0.9%) contained a residue above the MRL.

UK fruit & vegetable – 699 samples



Main findings and actions

- We did not find any residues above the MRL in apples, carrots, cauliflower, cherries, cucumber, grapes, kiwi fruit, lettuce, onions and pears.
- Similar to previous years, out of the 23 samples of beans with pods that had a residue over the MRL, 22 were samples of speciality beans. These are varieties not commonly grown in Europe, so many of the MRLs are set at the LOD.
- Out of the 6 samples of speciality fruit with a residue over the MRL, 3 were pomegranates with an exceedance of lambda-cyhalothrin. Lambda-cyhalothrin is used as an insecticide.
- Out of the 18 okra samples with a MRL exceedances, 7 were samples of frozen okra. We collect frozen okra in the survey as frozen okra is usually from different sources than fresh okra.

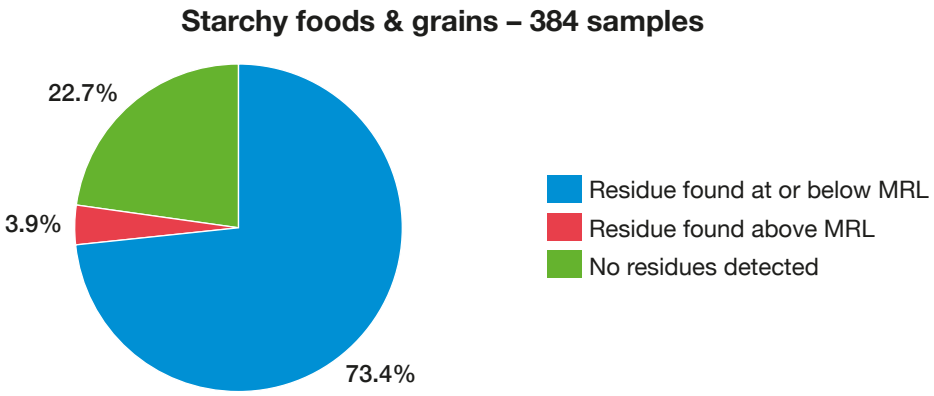
Results by food type

Food	Number of samples tested	Number of samples containing residues at or below MRL	Number of samples containing residues above the MRL	Number of samples containing more than one pesticide
Apples	97	78	0	62
Beans with pods	96	31	23	38
Carrots	96	25	0	11
Cauliflower	96	14	0	5
Cherries	97	92	0	77
Cucumber	96	67	0	40
Grapes	120	104	0	81
Kiwi fruit	120	57	0	13
Lemons and limes	72	69	1	63
Lettuce	73	39	0	21
Okra	90	28	18	19
Onions	96	48	0	2
Oranges	96	89	2	89
Parsnips	48	42	1	33
Pears	96	90	0	84
Peppers	72	36	2	18
Potatoes	156	72	3	24
Prepared fresh fruit	96	23	3	2
Raspberries	72	54	1	40
Speciality fruit	62	26	6	9
Spring greens and kale	36	27	3	23

9. Starchy food and grains results

We tested 384 samples for up to 375 pesticides. We carried out tests on around 141,192 food and pesticide combinations.

We found residues in 297 (77.3%) of these samples, 15 of those samples (3.9%) contained a residue above the MRL.



Main findings

- We didn't detect any residues above the MRL in bread, rye flour or rye grain.
- Of the rice samples with a residue over the MRL, 6 contained a residue of tricyclazole above the MRL. The MRL for tricyclazole was lowered to 0.01* mg/kg from 30 June 2017 for all rice except basmati. When the regulation amending the MRL was published, a transitional provision meant that products imported or placed on the market before 30 June 2017 were still subject to the previous MRL of 1 mg/kg. Where evidence was received to show that the rice samples were imported or placed on the market before 30 June 2017, we applied the previous MRL.

Results by food type

Food	Number of samples tested	Number of samples containing residues at or below MRL	Number of samples containing residues above MRL	Number of samples containing more than one pesticide
Bread	216	200	0	55
Rice	96	50	15	51
Rye flour	45	8	0	3
Rye grain	27	24	0	14

Applying processing factors to find MRLs for processed foods

MRLs apply to all traded foods, including foods used as ingredients. The law specifies the level to apply to foods as they are traded. For almost all foods that means their raw, unprocessed form. But MRLs also apply to prepared and processed foods in which case the effect of processing needs to be taken into account.

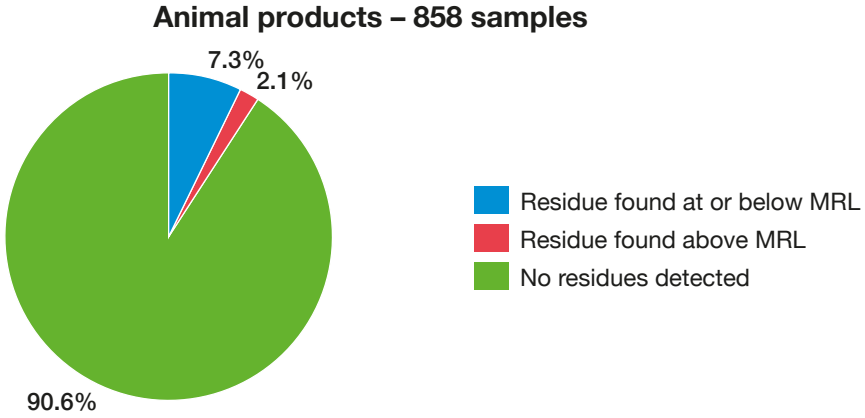
To check that prepared and processed foods were made with ingredients that complied with MRLs, we use appropriate processing factors based on scientific studies of the effect of preparation and processing. Different forms of processing remove, concentrate or dilute residues and the effect may also vary depending on the food and pesticide concerned.

The use of processing factors enables checks that the original ingredient was compliant with MRLs. Food manufacturers should have information on how they check their ingredients and also on their recipes and preparation techniques – for instance, how much water is added/removed, or how much of an ingredient is used to make a food.

10. Animal products results

We tested 858 samples for up to 100 pesticides. We carried out tests on around 71,136 food and pesticide combinations.

We found residues in 81 (9.4%) of these samples. 18 of those samples (2.1%) contained a residue above the MRL.



Main findings

- We didn't find any of the residues we looked for in shellfish.
- We didn't find any residues above the MRL in oily fish, lamb and milk.
- All the MRL exceedances in animal products were residues of BAC – as with previous findings of BAC, we expect that the residues result from the use of BAC as a disinfectant in the preparation and processing stages of meat and dairy production, rather than as a pesticide.

Results by food type

Food	Number of samples tested	Number of samples containing residues at or below MRL	Number of samples containing residues above MRL	Number of samples containing more than one pesticide
Cheese (hard)	96	0	1	1
Fish (oily)	108	28	0	0
Lamb	72	7	0	0
Milk	300	2	0	0
Poultry meat	108	7	10	0
Poultry meat (processed)	90	19	6	3
Shellfish	48	0	0	0
Yoghurt	36	0	1	0

DDT

As we expected, we found DDT in some samples of oily fish and lamb in 2017. The levels we found were under the MRL, would not be expected to have an effect on health, and are consistent with the continued decline of this pesticide in the environment.

The use of DDT is banned in the UK and banned or heavily restricted in many countries worldwide. It isn't allowed for use on food crops any more but it is still used in some countries outside the EU as a public health insecticide. Residues of DDT take a long time to break down in the environment and can accumulate in fatty tissue which is a major reason that it has been banned in the EU and many other countries.

Due to the bans and restrictions on use, the levels in food have decreased substantially since the 1960s and 1970s. Even so, because it takes a long time to break down, we do expect, and do see, occasional DDT residues in our monitoring results. Overall, the incidence and the size of residues have fallen steadily over time, which is what we would expect. In recent years none of our findings were unusual, unexpected or of concern. For residues found in 2017 we can tell from the chemical form that the laboratories detected whether the residues found are from historic use (which is what we usually find). We explain this every time we publish DDT results to try to make it as clear as we can that the results show food producers are not using DDT today. We are aware that this information is sometimes not included when our results are referenced by others.

The residues we find nowadays are at levels that would not be expected to have any effect on health, either in the short term or in the long term, when checked against today's understanding of the effect of DDT on health. As a committee, we take care to ensure we look thoroughly at this, and the FSA is also actively involved in our considerations.

Fipronil in eggs

In summer 2017 the Dutch and Belgian authorities identified that a contractor had used a product containing fipronil on hen housing. They tested eggs from affected production units and found residues of fipronil above the pesticide MRL. Action soon began across Europe to track down and test eggs from the affected farms and foods made from them.

As a precaution the UK food industry quickly withdrew a wide range of manufactured foods made with eggs from the Dutch and Belgian production units. Testing showed that some eggs with residues had entered the UK food chain but no cases of risk to human health were found. Eggs from UK chickens, which had been collected for veterinary medicine residues testing, were tested for fipronil and no residues were detected.

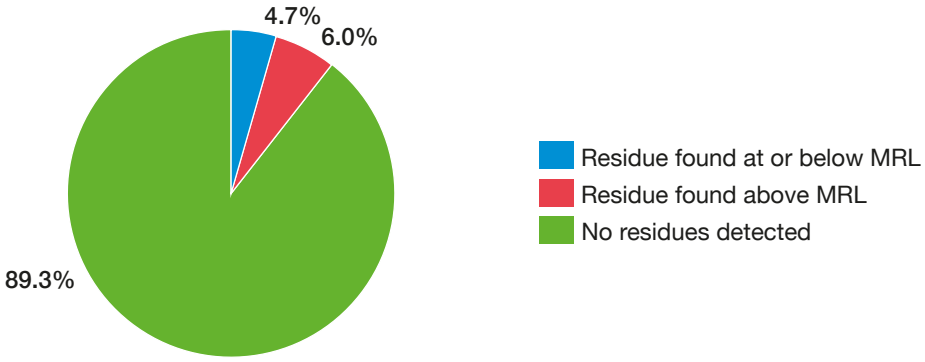
We had not planned any testing of eggs ourselves in 2017. As so much activity was already taking place and there was no identified risk to UK consumer health or evidence of illegal use in the UK, changing our plans to add more testing was not necessary. However, as we already have an egg survey planned for 2018, we will look for fipronil and some other plant protection insecticides that we haven't looked for before in that survey.

Fipronil is an insecticide that kills a broad spectrum of insects, including fleas and mites. It is not approved in the EU for use on or around chickens, so the pesticide MRL for fipronil in chicken and chicken eggs is set at the default (lowest level that can routinely be detected).

11. Infant food and other groceries results

The other groceries that we tested this year were baked beans, soya milk, soya products and dried speciality beans. The infant food that we tested was infant formula.

We tested 232 samples for up to 371 pesticides. We carried out tests on around 85 196 food and pesticide combinations. We found residues in 25 (10.7%) of the samples. Of those samples, 14 (6%) contained a residue above the MRL.



Main findings

- We didn't detect any of the residues we looked for in baked beans or soya milk.
- Five of the six samples of speciality dried beans with a residue above the MRL were mung beans.
- The legal limit for any pesticide in infant formula (as made up in the way required for feeding), is a default of 0.01 mg/kg unless lower levels are specifically needed. We found chlorate residues in eight samples of infant formula above the defaults level. We understand that these residues, and the other residues of chlorate found in foods, are probably from sources other than pesticides (there is more background on chlorate in our 2016 report). Our report for Q4 2017 has more information about how chlorate residues are being considered in general. We expect to continue to test for chlorate residues during 2018 and report in detail in our 2018 annual report and as necessary going forward.

Result by food type

Food	Number of samples tested	Number of samples containing residues at or below MRL	Number of samples containing residues above MRL	Number of samples containing more than one pesticide
Baked beans	24	0	0	0
Infant formula	38	0	8	0
Soya milk	47	0	0	0
Soya products	51	7	0	2
Speciality beans (dried)	72	4	6	4

12. The school fruit and vegetable scheme

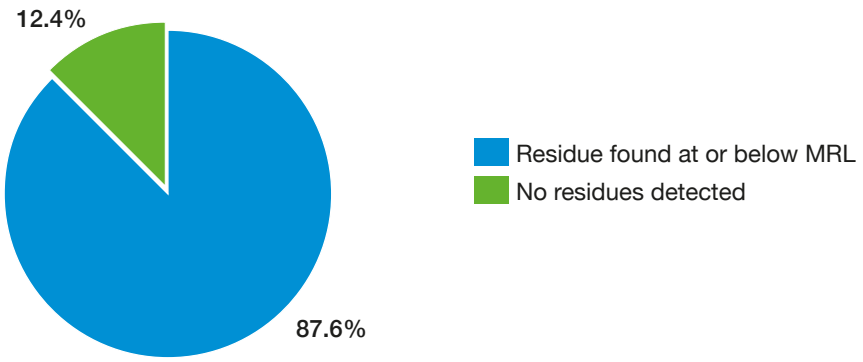
The Department of Health and Social Care (DHSC) funds the School Fruit and Vegetable Scheme, which is part of a programme to encourage children to eat at least five portions of fruit and vegetables each day. Under the scheme, all school children between four and six in local-authority-maintained infant, primary and special schools in England are entitled to a free piece of fruit or vegetable each school day. In 2017, the scheme distributed around 444 million pieces of fruit and vegetable to 16,456 schools across England.

The PRiF's role in the scheme is to check samples of the fruit and vegetables provided by the scheme for pesticide residues. As with other foods supplied to the public, any residues in these fruit and vegetables must comply with MRLs. NHS Supply Chain, on behalf of DHSC, buy fruit and vegetables from growers who follow UK food safety schemes of equivalent food produced abroad. HSE obtain samples of fruit and vegetables from the scheme's suppliers and then test them for residues at Fera Science Limited. We compare results for each sample with the relevant MRLs and assess whether any residues found would be likely to affect children's health.

At the end of the 2016-17 school year, DHSC decided to make all suppliers to the School Fruit and Vegetable Scheme provide more stringent evidence of full compliance with all relevant legislation before produce is supplied to the scheme, together with a written declara to light. The PRiF will no longer be involved in checking samples supplied to the scheme for pesticide residues.

We publish our findings of samples taken during each school term on gov.uk: https://www.gov.uk/government/publications/pesticides-residues-in-food-school-fruit-and-vegetable-scheme-2016-to-2017

We tested 137 samples for up to 375 pesticides and found residues in 120 of these samples (87.6%). None of the samples contained a residue above the MRL.



Results by food type

Food	Number of samples tested	Number of samples containing residues at or below MRL	Number of samples containing residues above MRL	Number of samples containing more than one pesticide
Apples	25	25	0	24
Bananas	27	21	0	21
Carrots	18	17	0	13
Pears	16	16	0	16
Raisins	10	10	0	10
Soft citrus	14	14	0	12
Strawberries	6	6	0	6
Sugar snap peas	6	3	0	3
Sweet peppers	6	4	0	1
Tomatoes	9	4	0	2

13. Cumulative risk assessments

National and international regulatory bodies agree that approaches to assess risks from multiple pesticides need to be developed, so that people's exposure to combinations of pesticide residues can be considered. National regulations on pesticides and MRLs include references to this and require that when an acceptable methodology is available, regulators should use it. Development work is ongoing and HSE are expecting an update from the collaborative project in June 2018.

Cumulative risk assessment (CRA) requires consideration of complex interacting sets of data which cover toxicology, residues, and risk management issues (see diagram).

In recent years much work has been done to establish which pesticides should be combined in cumulative assessment groups (CAGs).

Four published European Food Safety Authority (EFSA) scientific opinions suggest:

- pesticides will typically be grouped on a precautionary basis of potentially adverse common effects seen in target organs or organ systems;
- grouping on a common mode or mechanism of action may produce a more realistic assessment, however this level of detail is typically unavailable;
- combined effects will be then be assessed on the basis of dose addition (with each pesticide contributing to the combination in proportion to its dose and potency);
- synergisms are unlikely at typical exposures;
- exposure duration considerations may lead to different groupings for acute and chronic effects.

A consequence of the precautionary approach is that CAGs can be very large. For example the CAG for chronic thyroid effects contains 101 of 287 pesticides so far evaluated, and the CAG for nervous system effects contains 68 of the 287 pesticides evaluated (this CAG can be divided for acute and or chronic effects). However, actual risks are expected to be driven by only a few pesticides. In any situation where a consumer is exposed to several pesticides, the majority of those pesticides are unlikely to contribute significantly due to low exposure or low potency or both.

Evaluations for CAGs have to consider a large amount of detail and require a high level of expertise to determine the relevant toxic endpoints required. Significant steps have also been made in producing a software tool to enable exposures to be assessed. An EU-funded research consortium with partners from 14 countries, including the UK, developed methods and software to implement EFSA scientific opinions on cumulative risk assessment. The software has been further developed by follow-on action by the Dutch National Institute for Public Health and the Environment (RIVM) and EFSA. This was necessary to handle large CAGs, extremely large residues and consumption data sets. It now runs on the Dutch high-performance parallel computing facilities.

With these foundations in place the EU Commission set up a working group including EFSA and member states to consider technical questions of when and how CRA for pesticides should be introduced. The working group is being informed by detailed CRA test cases performed by EFSA and RIVM with the CAGs mentioned above. In parallel, assessment of additional pesticides for existing CAGs and assessment for CAGs covering effects on liver, adrenals, eyes, reproduction and development is continuing. This work was planned to run from 2015-2018. The working group will meet in June 2018 to consider the outcome and next steps.

14. Strawberry residues case study

What was the issue?

- PRiF's terms of reference enable us to act as a check on the regulatory system – if we see something unusual we can ask for more information even if it is not a risk or compliance issue
- In 2016 we tested strawberries as part of our routine monitoring programme and discussed these results in 2017
- All of the residue levels detected in UK strawberries were of pesticides permitted for use on strawberries and were within legal levels
- There were no consumer safety issues identified
- The number of residues detected per sample varied significantly, with one UK sample containing residues of 16 different pesticides
- We wanted to find out why a grower would need to use 16 different pesticides and whether this was good practice as there was a wide range of findings

How did we take it forward?

- We asked HSE to find out more from the supplier and the industry groups which represent main suppliers of strawberries
- Some of the PRiF members visited a major strawberry producer in Kent to see how disease control was managed
- We also asked for a view from the Fungicide Resistance Action Group (FRAG)[1]

What did the PRiF discover?

- That there has been a significant change in the way that strawberries are grown in the UK over the last 10 years
- The crop is now predominately grown under protected polytunnels and can produce fruit from March until early November
- Diseases may occur throughout that time which could reduce yield, make fruit unmarketable or destroy the plants entirely; different disease outbreaks need different treatments, at specific times
- Disease control is sought by a mixture of cultural techniques, biological control, plant breeding and chemical means
- Growers are using fungicides in accordance with the legal recommendations to maintain the health of the plant so that marketable fruit can be produced over an extended period
- Products containing active substances from several different biochemical mode-of-action (MOA) groups are being used to combat resistant populations of Botrytis and to control Powdery Mildew, these being the two most common diseases of strawberries
- At the spring 2018 Fungicide Resistance Action Group (FRAG-UK), meeting members heard that resistance in Botrytis to pesticides with different modes of action was now common in soft fruit production in Germany
- A lack of understanding of resistance status could mean that some growers will experience control failures or difficulties in efficacy which will increase pesticide usage and could be prevented with more monitoring of the resistance status of a disease

1 https://cereals.ahdb.org.uk/frag

- Botrytis samples gathered from a range of UK horticultural crops under a recent Defra-funded project all carried the G143A mutation, which can reduce effectiveness in a particular group of important fungicides from the QoI (Quionone outside Inhibitors) group and need alternative follow-up treatments.

What was our conclusion?

- We think it is important to periodically review pesticide residues findings, particularly when crop production methods change or when we see something which is unusual
- Growers should have more information about resistant populations and advice as to whether there is cross-resistance to different groups of chemicals, to avoid the applications of different pesticides which will offer no benefit to overall pest or disease control – FRAG-UK have agreed to produce a guidance document for UK soft fruit growers
- We observed that the industry was looking to technology both to forecast pest and disease pressures and to improve control by a range of methods – it will be helpful to revisit when we next test strawberries
- We will continue to follow up situations where the residue profile is notable or unusual
- We don't think we need to follow up with further testing immediately – we plan to test strawberries again in 2019, and as usual we'll test samples from any source that is on the UK market

15. Organic samples

In 2017, out of the 3357 samples that we tested, 279 were labelled as organic. Although we do not specifically target organic foods in all our surveys, they are tested as part of the monitoring programme as they are available for people to buy.

Residues in organic samples

Organic farmers and growers are allowed to use a limited number of approved pesticides where other methods of control are inadequate to prevent damages by pests, diseases and weeds.

Nine of the organic samples that we tested contained a pesticide residue. One of the samples contained a residue above the MRL. All the results were passed to the section in Defra that deals with organic farming.

The following organic samples contained residues. None of the residues detected would be expected to have an effect on health.

Food	Country of origin	Pesticide residue found	Amount of residue found (mg/kg)	MRL (mg/kg)
Cauliflower	Spain	azoxystrobin	0.1	5
		chlorantraniliprole	0.02	0.6
		indoxacarb	0.03	0.3
		spinosad	0.01	2
Cucumber	Spain	spinosad	0.03	0.3
Cucumber	Spain	fosetyl - Al	6.9	75
Lettuce	Spain	spinosad	0.02	10
Lettuce	Spain	spinosad	0.02	10
Parsnip	UK	linuron	0.03	0.2
Prepared fresh fruit	Belgium	DDAC	0.01	0.1
Rye flour	UK	chlormequat	0.04	3
		mepiquat	0.6	No MRL
Yogurt	UK	BAC	1.4	0.1

* **Maximum Residue Levels set at the LOD (LOD MRL):** these MRLs are set at a default level, i.e. at the limit of determination (LOD) as specified in EC Regulation 396/2005

16. Suspected unapproved uses in the UK

We are able to check the samples labelled as UK produce to see if they contain residues of pesticides which are not approved for use on those crops in the UK.

Sometimes we do find residues of pesticides which have not been approved for use on particular UK grown crops. There are different reasons this may occur, such as:

- the crop has been grown from imported seed or seedlings which were treated legally in another country and the residue is still detectable in the adult plant;
- a food was grown or produced overseas but the country of origin on the packaging is that of the brand owner or where it was packed (processed foods may be grown in one country but processed in another);
- if the residues are very low, this may have been caused by poor agricultural practise, such as failing to take appropriate steps to control spray drift or equipment not being correctly cleaned between uses;
- illegal use;
- accidents and unexpected consequences.

If we find a residue of a pesticide that has not been approved for use in the UK on that crop, we inform the HSE enforcement team about our results so they can consider investigating.

We referred the following samples to HSE Enforcement in 2017:

Food	Pesticide residue found	Amount of residue found (mg/kg)	MRL (mg/kg)
Apple	paclobutrazol	0.01	0.5
Apple	paclobutrazol	0.01	0.5
Apple	paclobutrazol	0.02	0.5
Beans with pods	boscalid	0.01	5
Beans with pods	boscalid	0.05	5
Carrots	iprodione	0.04	10
Cauliflower	tri-allate	0.01	0.1*
Cucumber	acetamiprid	0.04	0.3
Cucumber	fluopyram	0.02	0.5
Cucumber	fluopyram	0.05	0.5
Kale	linuron	0.01	0.05*
Kale	linuron	0.02	0.05*
Kale	linuron	0.02	0.05*
Kale	linuron	0.02	0.05*
Kale	linuron	0.02	0.05*
Pears	paclobutrazol	0.02	0.5
Pears	paclobutrazol	0.03	0.5

*** Maximum Residue Levels set at LOD (LOD MRL):** these MRLs are set at a default level, i.e. at the limit of determination (LOD) as specified in EC Regulation 396/2005

HSE Enforcement's investigation into most of these cases found that no illegal use had taken place and the residue was present for another reason. In some cases, the investigation is still ongoing and the results will be published in one of our quarterly reports once the investigation has been completed.

17. Assessing the risk to people's health

Since 2008, every result which contained a residue has been checked to see if the residues found could have an effect on human health. We call these checks risk assessment screens.

Risk assessment screening

In nearly all cases the risk assessment screening showed that people would eat less than the acute reference dose (ARfD), which is the amount of pesticide that a person can eat in one day without affecting their health, and less than the acceptable daily intake (ADI), which is the amount of that pesticide it is safe to eat every day for a lifetime. The risk assessment screening considers the amount eaten by 10 different groups of people based on consumption data supplied by FSA. These groups are infants, toddlers, young people (four different groups), adults, vegetarians, elderly people living in their own homes, and elderly people living in residential accommodation.

The ARfD and ADI values that we use in risk assessment screens are generally set by international bodies such as the European Food Safety Authority (EFSA), and the Joint Food and Agriculture Organisation/ World Health Organisation Meeting on Pesticide Residues (JMPR).

HSE assesses the health risk of any residues in food. The assessment is made by assuming someone has eaten near the maximum that we find in consumption patterns, identified from UK government food surveys. HSE takes the 97.5th consumption percentile as representing a high level of consumption. That means for every 100 people, 97 will have eaten less that HSE assumes. Other assumptions in HSE's assessments tend to overestimate rather than underestimate the risk. For example, for most fruits a first assessment assumes people have eaten the peel. This is not just for apples and pears (which are often consumed including the peel), but also for fruit which is more often eaten after being peeled. Risk assessments may then be refined using registration data about the distribution of residues in that food.

We take account of the more extreme consumption patterns of foods, so we ensure that HSE's risk assessments address the safety of consumers in general.

Detailed risk assessments

We publish risk assessments:

- for all situations where consumption patterns could lead to people eating more than the acute reference dose or acceptable daily intake of specific pesticides;
- where a sample contains a residue of more than one organophosphate or carbamate pesticide (or both), or residues of certain fungicides from the same chemical group (e.g. captan and folpet; triazoles; organophosphates) – each of these pesticide groups can have similar effects on people, so we check what could happen if these effects are added together.

We considered 28 detailed risk assessments during 2017. In each case we considered specific advice on the possible health risks. In most cases we found that risk to people's health was unlikely. For instance, 16 assessments were for citrus fruit, where we identified possible risk only where people with high consumption rates ate all of the peel as well as the flesh. Where the risk assessment showed that there may be a risk to health, we informed the FSA.

The full text of all the detailed risk assessments is in our quarterly reports or in our reports on samples taken from the School Fruit and Vegetable Scheme. These reports can be downloaded from gov.uk.

- Quarterly reports: https://www.gov.uk/government/publications/pesticide-residues-in-food-quarterly-monitoring-results-for-2017
- School Fruit and Vegetable Scheme reports: https://www.gov.uk/government/publications/pesticides-residues-in-food-school-fruit-and-vegetable-scheme-2016-to-2017

18. Follow-up action

If we find a residue above the relevant MRL it could just be in one sample. However, if we find that a number of samples contain residues of that particular pesticide above the MRL in one survey or in further surveys of the same food, it suggests that:

- the pesticide's approval is not in line with the MRL (pesticides approved in the UK are rarely out of line with the MRLs, but there may be problems with imported foods);
- the MRL is set at the limit of determination (the lowest amount that can normally be detected and measured by official laboratories), which is a default level that does not take account of the uses not covered by the MRL setting system, in particular in countries outside Europe;
- some people who grow or store food are not using pesticides properly.

Main actions

- All samples with residues over the MRL were reported to the retailers, suppliers or growers involved. We asked them to explain why the residues were over the MRL. Where they asked us to, we published these explanations in our quarterly reports.
- All UK samples with a residue of a pesticide not approved for use in the UK on that crop were reported to HSE Enforcement for further investigation.
- For all non-UK produce with a residue over the MRL, we wrote to the relevant authorities in the countries the produce was exported from.
- When we found a residue that was over the MRL that could be a risk to health we informed the FSA. They informed the Rapid Alert System for Food and Feed (RASFF). Our quarterly reports include details of RASFF notifications issued as follow up to the monitoring results.
- Any residues detected in organic samples were reported to the team in Defra that deal with organic produce as well as being copied to the relevant organic control body.
- We can target further monitoring of a food where we have found residues of interest. Examples of this are the continued monitoring of beans with pods and okra.
- Alongside the quarterly reporting we run a programme called rolling reporting, this is 5 commodities which are sampled and reported on every month throughout the year. In 2017 the commodities in the programme were beans with pods, grapes, okra, potatoes and prepared fruit.
- HSE is able to prosecute growers or suppliers they find breaking the law. If we suspect that pesticides are being used illegally in the UK, the Health and Safety Executive (HSE) may carry out further investigation.

Examples of follow-up action

- One sample of lettuce from the UK contained a residue of cypermethrin which is not approved for use on lettuce in the UK. HSE Enforcement investigated the source of the residue and discovered that the farmer had legally sprayed cypermethrin on a cabbage crop before spraying a different pesticide on to the lettuce. HSE believe the residue occurred due to the equipment not been cleaned correctly in between applications. HSE Enforcement reminded the farmer of their obligations and good practice.
- HSE have continued to send all non-compliant results of okra and beans with pods to the FSA for them to include in the data set used when deciding what foods and sources should be included on heightened border controls.

19. Legal Controls On Pesticide Residues

Maximum Residue Levels (MRLs)

It is illegal to sell, supply, distribute or import food with residues above the MRLs. MRLs are set for individual pesticides in specific foods based on the highest level of a residue expected to be in a food when the pesticide is used in line with good agricultural practice. MRLs are set at levels which may occur when the pesticide is used properly, taking into account worker and environmental safety as well as the level needed to work as a pesticide. MRLs are also set below the level considered to be safe for people eating the food.

For any pesticide without a specific MRL, a default value of 0.01 mg/kg is set. Our laboratories' reporting levels (the lowest levels our tests are set to measure) when testing samples are set in line with the default MRL (0.01 mg/kg).

Pesticide residue testing

MRL legislation requires an annual pesticide residue testing programme which is representative of the country's food supply market. The programme must take samples close enough to the point where produce enters the food supply market to enable follow up activity to take place if the food does not comply with the law.

The UK also shares its results with a European-wide monitoring programme. Results are compiled and published by the European Food Safety Authority (EFSA).

As well as the laws on levels of pesticide residues allowed in food, there are laws on the authorisation, selling, supplying, using, storing, importing and advertising of pesticides. More information is available on the HSE website.

20. Members of the Expert Committee on Pesticide Residues in Food (PRiF)

Dr Paul Brantom
Chairman

Dr Paul Brantom is a registered toxicologist and has worked in toxicology of food-related chemicals for more than 40 years. He was previously Head of Toxicology at BIBRA International and Manager of the University of Surrey Centre for Toxicology.

He is currently semi-retired but continues to work as an independent consultant in toxicology risk assessment, mainly for international and national organisations. Following previous research experience he retains particular interest in toxicological risk assessment including non-animal testing methods and carcinogenicity.

Dr Brantom is a past member of UK Advisory Committees on Novel Foods and Processes (ACNFP), Veterinary Products (VPC), Veterinary Residues (VRC) and Animal Feedingstuffs (ACAF). He is also a past member of the FEEDAP panel of EFSA (European Food Safety Authority) and continues to work with EFSA on a number of working groups.

Dr Jonathan Blackman

Dr Jonathan Blackman is a graduate of Wye College, University of London and studied for a DPhil at the University of Sussex.

He has worked as an agronomist and technical manager in the horticultural industry for 20 years, and prior to that worked as a Soil Scientist and Research Scientist for ADAS. He holds the BASIS Diploma in Agronomy and his work involves advising growers of fruit, hops and ornamental crops and providing technical support to fellow horticultural agronomists working for H L Hutchinson Ltd.

In addition to growers, he has provided consultancy services to packers, industry bodies such as the Agriculture and Horticulture Development Board (AHDB) and the British Hop Association, and sits on several industry committees.

Ann Davison

Ann Davison began her career at Which? and has worked in consumer affairs for most of her career, running consumer organisations and networks such as Foodaware: the Consumers' Food Group. She won the UK Woman of Europe 2000 Award.

Ann has served as a consumer representative on a number of government committees including Defra Expert Panel on Air Quality Standards, the Adult Learning Committee of the Learning and Skills Council and currently the Food Standards Agency's Advisory Committee on Animal Feeding Stuffs.

For nearly six years, she was Defra's consumer adviser and ran its consumer representatives group. Ann takes a special interest in food, health and standards issues. She co-founded the Fairtrade Foundation and chaired its Certification Committee for 11 years. She currently chairs the PRiF Communications Sub-committee and serves on the National Consumer Federation's Communications Committee and is an active member of the National Council of Women.

Dr Stuart Freeman

Dr Freeman is a fellow of the Royal College of Pathologists and an independent toxicology consultant with 25 years' experience of the pharmaceutical and consumer products industries. During this time he worked at Smith Kline and French; AstraZeneca, where he was Head of the Reproductive and Development Toxicology Group; and GlaxoSmithKline Consumer Healthcare, where he was head of toxicology for the worldwide business. Dr Freeman has served on numerous industry committees and published and presented extensively in the field of toxicology.

Katie Knaggs

Katie Knaggs is the Group Sustainability Manager at International Procurement and Logistics Ltd (IPL). In her role she develops projects and informs policies on economic, social and environmental sustainability performance across a range of food supply chains including primary agricultural production. Katie has worked in the fresh produce industry for over 15 years, both in retail and in the supply chain serving all UK retailers. Katie is from a livestock and arable farming background and has a BSc in Agri-Food Marketing and Management. Katie's expertise in pesticides is managing supply chains, retailer residue monitoring programmes and follow up investigations to grower level.

John Points

John Points is a consultant providing advice to food retailers and producers on chemical risk management, analytical testing, and interpretation of results. He also works on laboratory capacity-building projects for developing countries who need to test food for residues before export to the EU.

His previous career has been with Sainsbury's and with LGC, one of the UK's National Reference Laboratories, where he led the teams responsible for food, residues, consumer safety and workplace drugs testing. At Sainsbury's, his role included management of residue monitoring programmes and follow up of results within the own-brand supply chain.

John has previously been a member of the UK Veterinary Residues Committee, and has acted as a national expert on EC Food and Veterinary Office inspection missions to both EU and non-EU countries.

Tony Vallance

Tony Vallance has worked in the fresh produce industry since 1996. His background is in top fruit (apples and pears) and soft fruit, and he has also worked in cereals and salad production. Tony's knowledge of pesticides has been gained during 18 years of managing pesticide use and residue monitoring programmes in the supply chain.

Tony left the PRiF in January 2017.

Dr Glenis Wedzicha

Glenis Wedzicha read chemistry at the University of London, where her PhD research was on free radicals in an industrial context. She did postgraduate teaching training at the University of Oxford and her teaching career included teaching physics and chemistry to A level. She also wrote media articles as a freelancer about complex scientific and technical issues that affect society.

Glenis is the Science Co-ordinator of the North Yorkshire East (NYE) of Women's Institute (WI). She is an ex-officio member of their Public Affairs and International Committee as well as the membership and training sub-committee for the WI. She leads the scientific strategy of the federation, and her role includes helping members understand the impact of science on their lives and society in general. Glenis has recently been appointed the Resolutions Adviser of the NYE Federation.

She has a particular interest in the communication of food and environmental issues. Recently, Glenis is a member of the UK Chemicals Stakeholder Forum on which she represents the National Federation of WI's.

Analytical Sub-Group

The Expert Committee on Pesticide Residues in Food's Analytical Sub-Group (ASG) reviews the results of analysis by the laboratories before they are sent to HSE, to ensure their reliability.

Most of the members of the group are from laboratories, the group members during 2017 were:

- Helen Kyle – HSE's Chemicals Regulation Division (Chairman)
- Dr Sadat Nawaz – National Reference Laboratory (NRL) Representative
- Helen Barker – Fera Science Ltd
- Mark Kearney – Agri-Food and Biosciences Institute (AFBI)
- Kirsty Reid – Science and Advice for Scottish Agriculture (SASA)
- Laura Melton – Science and Advice for Scottish Agriculture (SASA)

Cost of our surveys

The budget for the UK pesticide residues monitoring programme is made up from a charge on the sales of approved pesticides by manufacturers and suppliers in the UK and the rest from the government. The largest proportion of the budget was spent on testing samples for pesticide residues.

HSE pays PRIF members a fee for each meeting attended. HSE also provides support to the committee and the sub-group.

Communicating the results and work of the PRiF

We want as many people as possible to be aware of the official pesticide residue testing programme and to understand what we do. To do this we:

- publish all the monitoring data on data.gov.uk in an accessible format every quarter;
- publish the results of our rolling reporting on data.gov.uk every month;
- publish an annual report in plain English;
- open one of our quarterly meetings each year to the public;
- ensure our Chairman is available for interviews with the media.

We have also prepared some extra background and explanatory information:

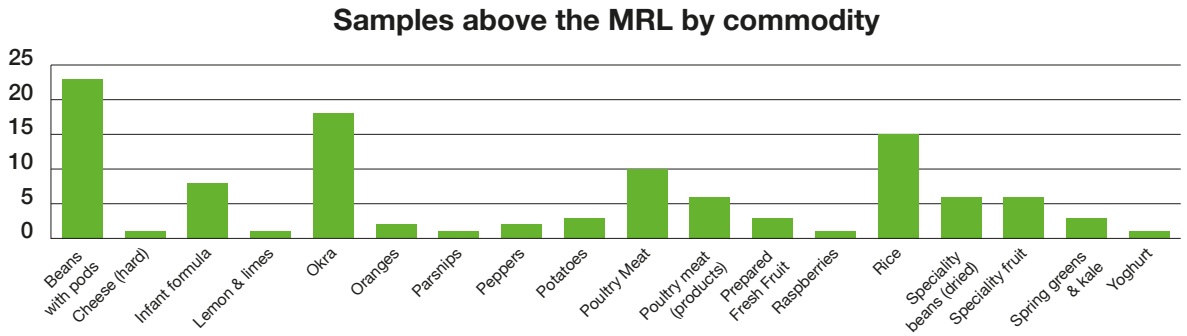
- Frequently Asked Questions at section 23 of this report;
- a glossary is in each quarterly report.

If you would like to receive notifications of publications please email prif@hse.gov.uk to join our mailing list.

21. All residues found above the MRL in 2017

Of the 3357 samples tested, 110 contained one or more residues above the relevant MRL.

MRLs are trading standards rather than safety levels, therefore these results do not automatically mean the levels of residue detected are a risk to people's health. The samples contained residues above the MRL were mainly fruit and vegetable samples.

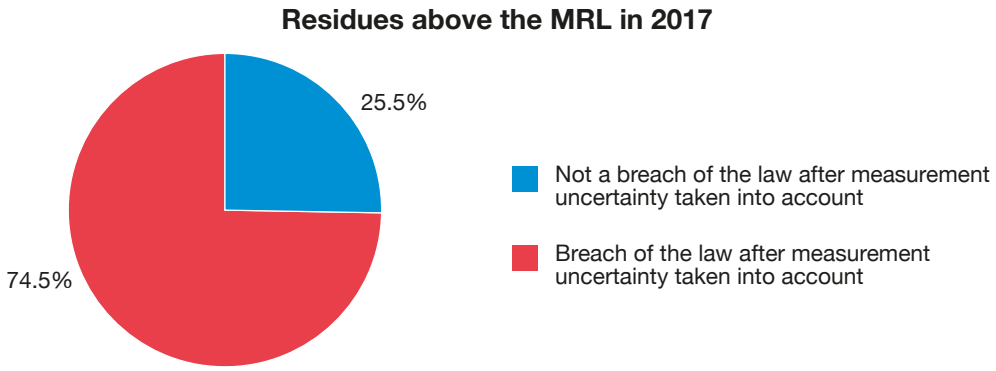


Analytical Measurement Uncertainty

No measurement can ever be guaranteed to be exact and this can be caused by many things. Measurement uncertainty is a calculated indicator of our confidence in the accuracy of the amount of pesticide the laboratory detected. It is not expressing a doubt about which pesticides we have found.

It has been agreed for reporting purposes only that measurement uncertainty will be applied to any result that contained a residue over the MRL. In line with the international guidance, we use a default value of 50% for measurement uncertainty. This means that when a sample has a residue over the MRL we subtract 50% of the reported value and check this value against the MRL. All residues still over the MRL after 50% measurement uncertainty has been applied are highlighted as breaching the law in our quarterly reports.

Measurement uncertainty can only be applied by a regulatory authority which in the UK is the HSE's Chemicals Regulation Division. It should not be applied by the food industry to determine whether a product is compliant with an MRL.



The table shows all samples in 2017 where we found at least one residue above the MRL. A number of the MRLs have (*) next to them, this means that the MRL is set at the limit of determination (the lowest level that can normally be detected by official laboratories). This often means that there are no authorised uses on those crops or that the pesticide itself is not authorised from use. As foods grown in other countries are not all covered by the MRL setting system, residues above these MRLs do not necessarily mean the farmer did not follow Good Agricultural Practice (GAP).

Sample reference number	Food	Country of origin	Pesticide residue detected	Residue level detected (mg/kg)	MRL (mg/kg)	Breach of the law after allowing for measurement uncertainty
3749/2017	Beans with pods: Fine beans	Morocco	bifenthrin	0.02	0.01*	No
0515/2017	Beans with pods: Guwar beans	India	flusilazole	0.02	0.01*	No
0516/2017	Beans with pods: Yard long beans	Malaysia	amitraz (sum)	0.5	0.05*	Yes
			diafenthiuron	0.05	0.01	Yes
			dimethoate (sum)	1.4	0.02*	Yes
			dithiocarbamates	1.1	1	No
			lufenuron	0.05	0.02*	Yes
0518/2017	Beans with pods: Hyacinth beans	Malaysia	chlorfenapyr	0.1	0.01*	Yes
			dimethoate (sum)	0.3	0.02*	Yes
0523/2017	Beans with pods: Guwar beans	India	captan (sum)	0.2	0.03*	Yes
			hexaconazole	0.02	0.01*	Yes
0526/2017	Beans with pods: Yard long beans	Spain	flonicamid (sum)	0.2	0.03*	Yes
0676/2017	Beans with pods: Guar beans	India	diafenthiuron	0.04	0.01	Yes
			dimethoate (sum)	0.1	0.02*	Yes
0699/2017	Beans with pods: Guar beans	India	triazophos	0.02	0.01*	No
0702/2017	Beans with pods: Guar beans	India	dimethoate (sum)	0.03	0.02*	No
0708/2017	Beans with pods: Yard long beans	India	dimethoate (sum)	0.1	0.02*	Yes
0761/2017	Beans with pods: Hyacinth beans	Malaysia	dimethoate (sum)	0.05	0.02*	Yes
0766/2017	Beans with pods: Guar beans	India	dimethoate (sum)	0.07	0.02*	Yes
0771/2017	Beans with pods: Yard long beans	Mexico	dimethoate (sum)	0.3	0.02*	Yes
0781/2017	Beans with pods: Valore beans	Kenya	profenofos	0.4	0.01*	Yes
0786/2017	Beans with pods: Hyacinth beans	India	captan (sum)	0.2	0.03*	Yes
			profenofos	0.04	0.01*	Yes
			propiconazole	0.02	0.01*	Yes

Sample reference number	Food	Country of origin	Pesticide residue detected	Residue level detected (mg/kg)	MRL (mg/kg)	Breach of the law after allowing for measurement uncertainty
0791/2017	Beans with pods: Yard long beans	Malaysia	diafenthiuron	0.1	0.01	Yes
			methamidophos	0.09	0.01*	Yes
0809/2017	Beans with pods: Yard long beans	Malaysia	methamidophos	0.04	0.01*	Yes
			methomyl (sum)	0.5	0.1	Yes
0814/2017	Beans with pods: Drumstick beans	India	dithiocarbamates	2.8	1	Yes
0820/2017	Beans with pods: Hyacinth beans	Bangladesh	dimethoate (sum)	0.2	0.02*	Yes
			emamectin	0.05	0.01*	Yes
0824/2017	Beans with pods: Uri beans	Malaysia	chlorfenapyr	0.03	0.01*	Yes
			diafenthiuron	0.09	0.01	Yes
			dimethoate (sum)	0.06	0.02*	Yes
			Dithiocarbamates	1.5	1	No
			profenofos	0.03	0.01*	Yes
0958/2017	Beans with pods: Valore beans	Kenya	profenofos	0.9	0.01*	Yes
1106/2017	Beans with pods: Valore beans	Kenya	carbendazim (sum)	0.5	0.2	Yes
1112/2017	Beans with pods: Uri beans	Malaysia	abamectin (sum)	0.06	0.03	Yes
			dithiocarbamates	5.6	1	Yes
3911/2017	Cheese (hard)	UK	BAC (sum)	2.7	0.1	Yes
3779/2017	Infant formula	UK	chlorate	0.04	0.01	Yes
3783/2017	Infant formula	UK	chlorate	0.02	0.01	Yes
3785/2017	Infant formula	UK	chlorate	0.07	0.01	Yes
3786/2017	Infant formula	UK	chlorate	0.1	0.01	Yes
3790/2017	Infant formula	Ireland	chlorate	0.04	0.01	Yes
3152/2017	Infant formula	Ireland	chlorate	0.02	0.01	No
3792/2017	Infant formula	UK	chlorate	0.05	0.01	Yes
3793/2017	Infant formula	The Netherlands	chlorate	0.02	0.01	No
0553/2017	Limes	Brazil	carbofuran (sum)	0.03	0.01*	Yes
0519/2017	Okra	Honduras	tebuconazole	0.03	0.02*	No
0525/2017	Okra	Jordan	thiamethoxam	0.04	0.01*	Yes

Sample reference number	Food	Country of origin	Pesticide residue detected	Residue level detected (mg/kg)	MRL (mg/kg)	Breach of the law after allowing for measurement uncertainty
0679/2017	Okra	India	flonicamid (sum)	0.07	0.03*	Yes
0683/2017	Okra	India	flonicamid (sum)	0.08	0.03*	Yes
0707/2017	Okra	Jordan	acephate	1.3	0.01*	Yes
			methamidophos	0.05	0.01*	Yes
0765/2017	Okra	India	dithiocarbamates	0.6	0.5	No
			pyraclostrobin	0.1	0.02*	Yes
0807/2017	Okra	India	flonicamid (sum)	0.06	0.03*	No
0815/2017	Okra	Pakistan	lufenuron	0.06	0.02*	Yes
1340/2017	Okra	India	flonicamid (sum)	0.2	0.03*	Yes
4477/2017	Okra	India	acephate	0.02	0.01*	No
			flonicamid (sum)	0.07	0.03*	Yes
5395/2017	Okra	Egypt	chlorpropham (parent)	0.03	0.01*	Yes
5396/2017	Okra	Egypt	chlorpropham (parent)	0.02	0.01*	Yes
1603/2017	Okra	China	chlorfenapyr	0.02	0.01*	No
1669/2017	Okra	Egypt	profenofos	0.05	0.01*	Yes
3482/2017	Okra	India	acephate	0.05	0.01*	Yes
			flonicamid (sum)	0.1	0.03*	Yes
			monocrotophos	0.03	0.01*	Yes
3838/2017	Okra	Egypt	BAC (sum)	3.5	0.1	Yes
5062/2017	Okra	India	tebuconazole	0.05	0.02*	Yes
5123/2017	Okra	India	flonicamid (sum)	0.07	0.03*	Yes
0868/2017	Oranges	South Africa	2,4-D (sum)	1.2	1	No
1183/2017	Oranges	South Africa	methidathion	0.03	0.02*	No
2697/2017	Parsnips	UK	prosulfocarb	0.1	0.08	No
1330/2017	Peppers	Poland	ethephon	7.7	0.05*	Yes
0747/2017	Peppers	Iran	propargite	0.02	0.01*	No
0085/2017	Potatoes	UK	flonicamid (sum)	0.2	0.09	Yes
0112/2017	Potatoes	UK	pencycuron	0.2	0.1	No
0115/2017	Potatoes	UK	flonicamid (sum)	0.1	0.09	No
2510/2017	Poultry: Chicken	UK	BAC (sum)	0.2	0.1	No

Sample reference number	Food	Country of origin	Pesticide residue detected	Residue level detected (mg/kg)	MRL (mg/kg)	Breach of the law after allowing for measurement uncertainty
5059/2017	Poultry: Chicken	UK	BAC (sum)	0.2	0.1	Yes
5157/2017	Poultry: Chicken	UK	BAC (sum)	0.5	0.1	Yes
5259/2017	Poultry: Chicken	Thailand	BAC (sum)	0.6	0.1	Yes
3528/2017	Poultry: Turkey	UK	BAC (sum)	0.2	0.1	No
3555/2017	Poultry: Turkey	UK	BAC (sum)	0.4	0.1	Yes
3855/2017	Poultry: Turkey	UK	BAC (sum)	0.5	0.1	Yes
4944/2017	Poultry: Turkey	UK	BAC (sum)	3.9	0.1	Yes
4947/2017	Poultry: Turkey	UK	BAC (sum)	2.1	0.1	Yes
4997/2017	Poultry: Turkey	UK	BAC (sum)	0.6	0.1	Yes
1594/2017	Poultry (processed): Chicken	UK	BAC (sum)	0.2	0.1	No
1702/2017	Poultry (processed): Chicken	UK	BAC (sum)	0.2	0.1	Yes
1859/2017	Poultry (processed): Chicken	UK	BAC (sum)	0.4	0.1	Yes
2608/2017	Poultry (processed): Chicken	UK	BAC (sum)	0.5	0.1	Yes
4584/2017	Poultry (processed): Chicken	UK	BAC (sum)	0.3	0.1	Yes
5158/2017	Poultry (processed): Chicken	UK	BAC (sum)	0.2	0.1	No
3036/2017	Prepared fresh fruit: Mango	Egypt	BAC (sum)	0.5	0.1	Yes
4597/2017	Prepared fresh fruit: Mango	Egypt	BAC (sum)	0.2	0.1	Yes
2500/2017	Prepared fresh fruit: Pineapple	UK	BAC (sum)	0.2	0.1	No
1855/2017	Raspberries	UK	chlorpyrifos	0.02	0.01*	No
2068/2017	Rice: Basmati	UK	carbendazim (sum)	0.02	0.01*	No
			thiamethoxam	0.04	0.01*	Yes

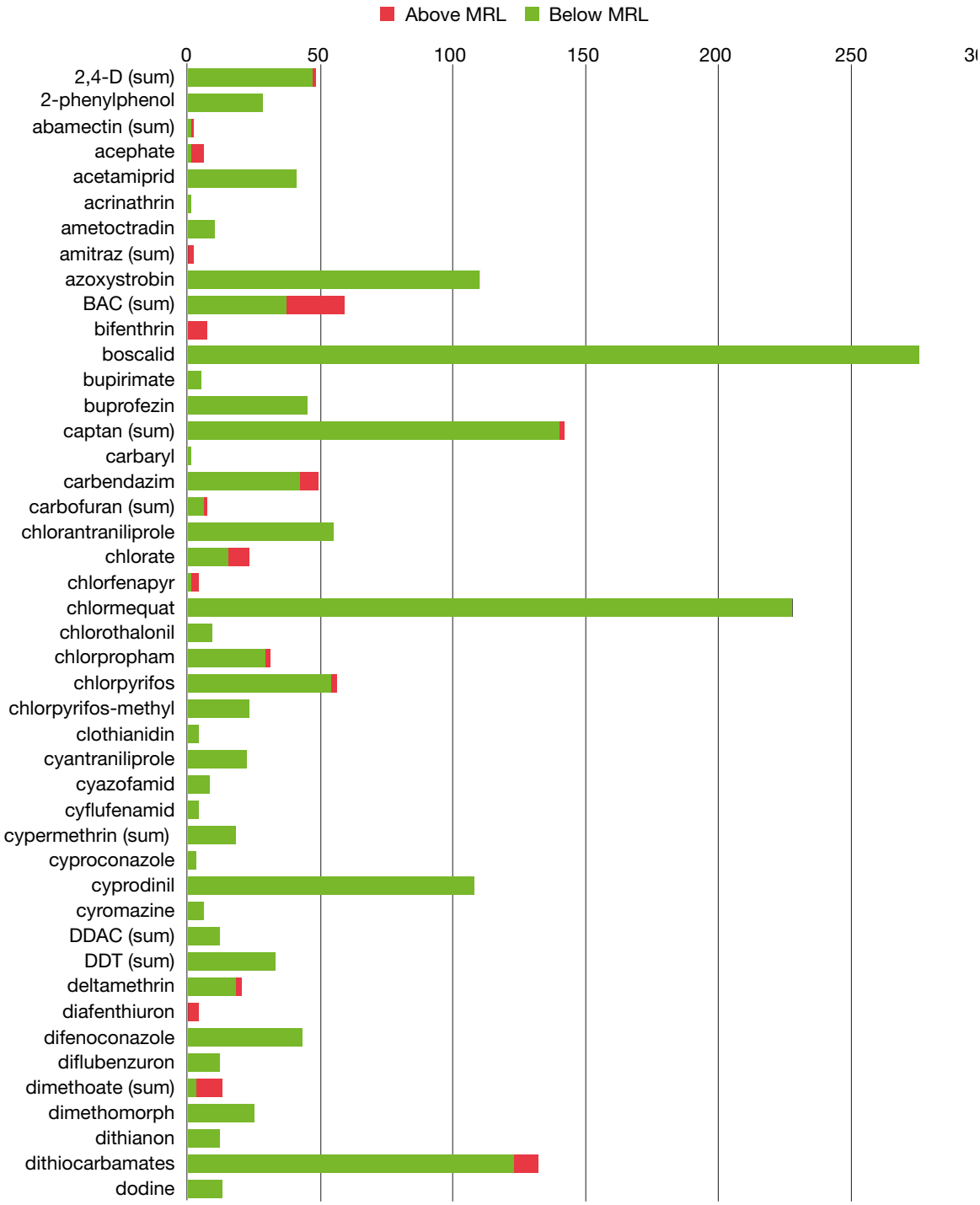
Sample reference number	Food	Country of origin	Pesticide residue detected	Residue level detected (mg/kg)	MRL (mg/kg)	Breach of the law after allowing for measurement uncertainty
2214/2017	Rice: Basmati	UK	acephate	0.2	0.01*	Yes
			carbendazim (sum)	0.03	0.01*	Yes
			methamidophos	0.03	0.01*	Yes
2725/2017	Rice: Basmati	Cambodia	thiamethoxam	0.05	0.01*	Yes
4985/2017	Rice: Basmati	India	triazophos	0.03	0.02*	No
5166/2017	Rice: Basmati	UK	carbendazim (sum)	0.02	0.01*	Yes
2360/2017	Rice: Brown	UK	tricyclazole	0.04	0.01*	Yes
3169/2017	Rice: Brown	UK	tricyclazole	0.03	0.01*	Yes
4510/2017	Rice: Brown	Greece	tricyclazole	0.04	0.01*	Yes
1677/2017	Rice: Other	UK	carbendazim (sum)	0.02	0.01*	No
3005/2017	Rice: Other	UK	triazophos	0.03	0.02*	No
3157/2017	Rice: Other	Spain	tricyclazole	0.02	0.01*	Yes
4048/2017	Rice: Other	UK	triazophos	0.03	0.02*	No
4403/2017	Rice: Other	UK	carbendazim (sum)	0.02	0.01*	No
			hexaconazole	0.05	0.01*	Yes
2839/2017	Rice: White	UK	carbendazim (sum)	0.02	0.01*	No
			hexaconazole	0.07	0.01*	Yes
			tricyclazole	0.06	0.01*	Yes
4901/2017	Rice: White	UK	hexaconazole	0.03	0.01*	Yes
			tricyclazole	0.05	0.01*	Yes
1977/2017	Speciality beans (dried)	UK	acephate	0.04	0.01*	Yes
			methamidophos	0.05	0.01*	Yes
2445/2017	Speciality beans (dried)	Burma	methamidophos	0.02	0.01*	No
3361/2017	Speciality beans (dried)	China	dithiocarbamates	3.6	0.1	Yes
4450/2017	Speciality beans (dried)	China	dithiocarbamates	1.4	0.1	Yes
5028/2017	Speciality beans (dried)	China	dithiocarbamates	5.3	0.1	Yes
			malathion (sum)	0.03	0.02*	No
5400/2017	Speciality beans (dried)	China	dithiocarbamates	7.9	0.1	Yes

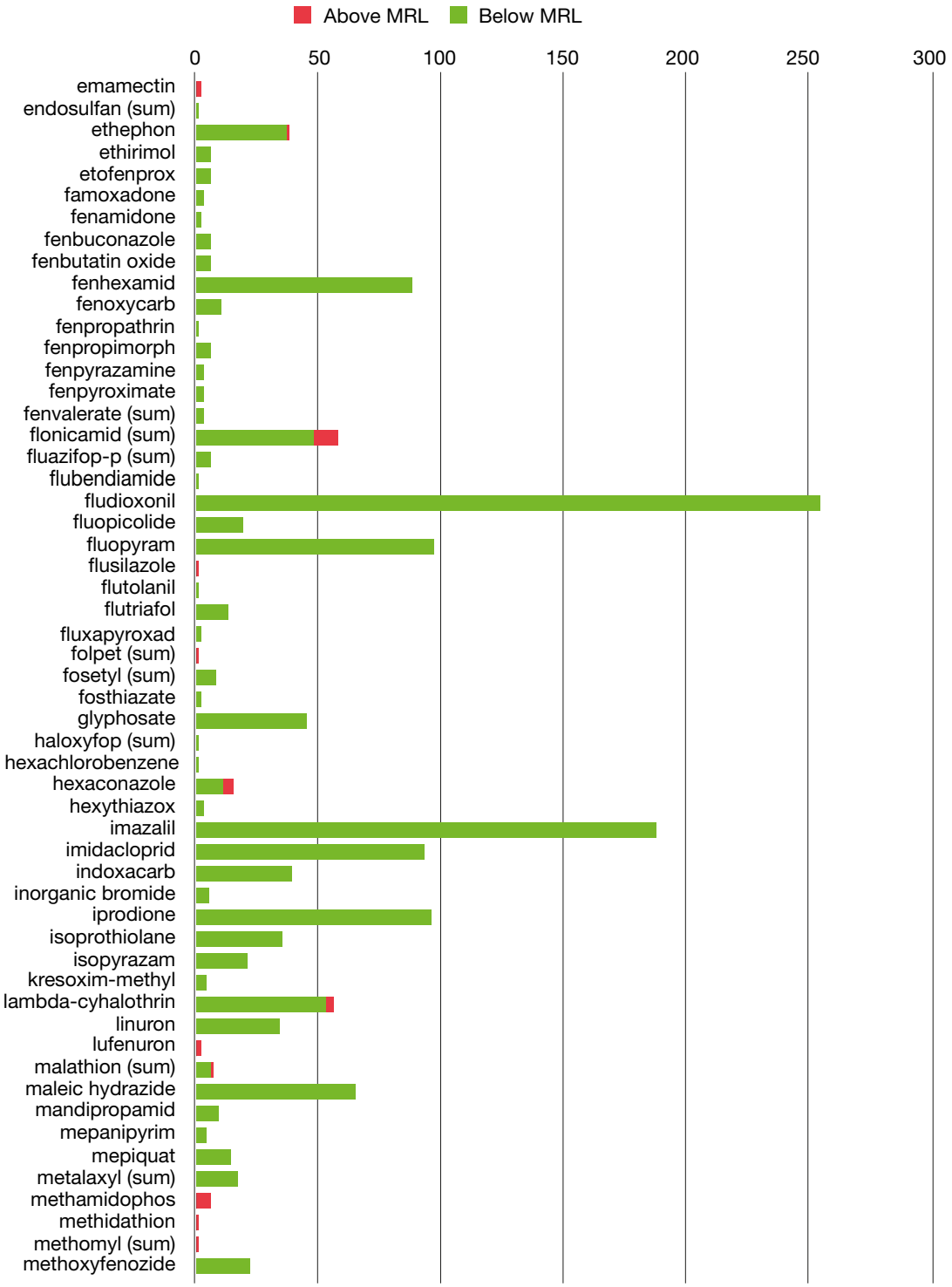
Sample reference number	Food	Country of origin	Pesticide residue detected	Residue level detected (mg/kg)	MRL (mg/kg)	Breach of the law after allowing for measurement uncertainty
0524/2017	Speciality fruit: Asian Pear	China	chlorpyrifos	0.02	0.01*	Yes
0853/2017	Speciality fruit: Dragon fruit	Vietnam	dithiocarbamates	0.07	0.05*	No
0846/2017	Speciality fruit: Passion fruit	Kenya	dithiocarbamates	0.4	0.05*	Yes
1060/2017	Speciality fruit: Pomegranates	Spain	lambda-cyhalothrin	0.03	0.02*	No
1077/2017	Speciality fruit: Pomegranates	Egypt	amitraz (sum)	0.2	0.05*	Yes
			lambda-cyhalothrin	0.04	0.02*	No
1251/2017	Speciality fruit: Pomegranates	Egypt	lambda-cyhalothrin	0.09	0.02*	Yes
4757/2017	Kale	Spain	deltamethrin	0.1	0.01*	Yes
4774/2017	Kale	Spain	deltamethrin	0.04	0.01*	Yes
4837/2017	Kale	Spain	emamectin	0.02	0.01*	Yes
3403/2017	Yoghurt	UK	BAC (sum)	1.4	0.1	Yes

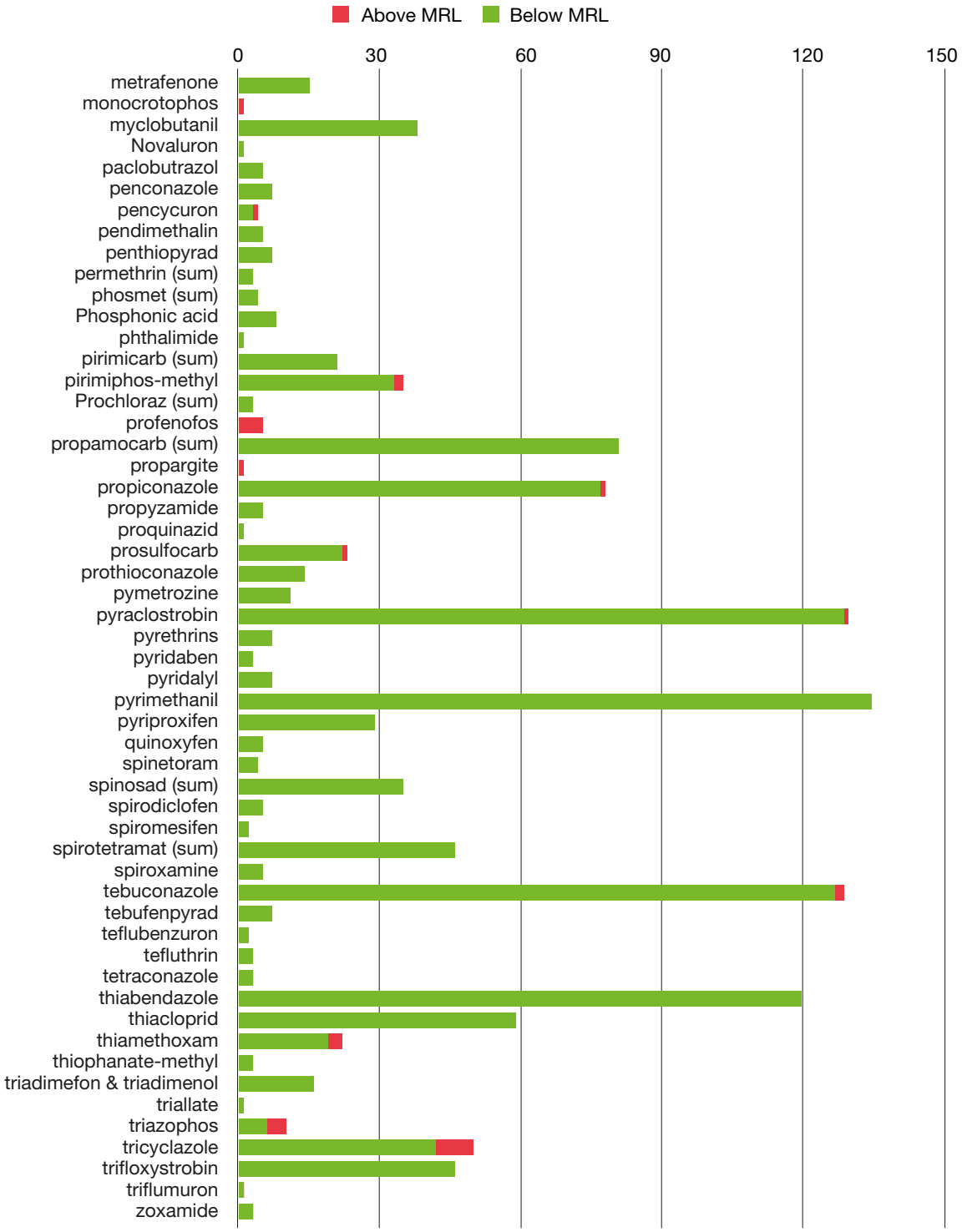
22. Analyte detections

The UK programme tests for up to 376 pesticides. During 2017, 154 different pesticides were detected; this will vary each year depending on the different foods tested.

The graph below shows the number of detections of each analyte below the MRL and above the MRL. Some of the analytes are 'sum' residues; this means the full residue definition (parent and metabolites) was sought.




Above MRL
Below MRL
0
50
100
150
200
250
300
emamectin
endosulfan (sum)
ethephon
ethirimol
etofenprox
famoxadone
fenamidone
fenbuconazole
fenbutatin oxide
fenhexamid
fenoxycarb
fenpropathrin
fenpropimorph
fenpyrazamine
fenpyroximate
fenvalerate (sum)
flonicamid (sum)
fluazifop-p (sum)
flubendiamide
fludioxonil
fluopicolide
fluopyram
flusilazole
flutolanil
flutriafol
fluxapyroxad
folpet (sum)
fosetyl (sum)
fosthiazate
glyphosate
haloxyfop (sum)
hexachlorobenzene
hexaconazole
hexythiazox
imazalil
imidacloprid
indoxacarb
inorganic bromide
iprodione
isoprothiolane
isopyrazam
kresoxim-methyl
lambda-cyhalothrin
linuron
lufenuron
malathion (sum)
maleic hydrazide
mandipropamid
mepanipyrim
mepiquat
metalaxyl (sum)
methamidophos
methidathion
methomyl (sum)
methoxyfenozide


Above MRL
Below MRL
0
30
60
90
120
150
metrafenone
monocrotophos
myclobutanil
Novaluron
paclobutrazol
penconazole
pencycuron
pendimethalin
penthiopyrad
permethrin (sum)
phosmet (sum)
Phosphonic acid
phthalimide
pirimicarb (sum)
pirimiphos-methyl
Prochloraz (sum)
profenofos
propamocarb (sum)
propargite
propiconazole
propyzamide
proquinazid
prosulfocarb
prothioconazole
pymetrozine
pyraclostrobin
pyrethrins
pyridaben
pyridalyl
pyrimethanil
pyriproxifen
quinoxyfen
spinetoram
spinosad (sum)
spirodiclofen
spiromesifen
spirotetramat (sum)
spiroxamine
tebuconazole
tebufenpyrad
teflubenzuron
tefluthrin
tetraconazole
thiabendazole
thiacloprid
thiamethoxam
thiophanate-methyl
triadimefon & triadimenol
triallate
triazophos
tricyclazole
trifloxystrobin
triflumuron
zoxamide

23. Frequently asked questions (faqs)

About the results

Where can I find your results?

Our latest reports are on the UK government website: www.gov.uk/government/collections/pesticide-residues-in-food-results-of-monitoring-programme. Our data are separately available for download in spreadsheet format: https://data.gov.uk/dataset/5d5028ef-9918-4ab7-8755-81f3ad06f308/pesticide-residues-in-food

We can send you an email announcing publication of results and other news. We generally send at the most three emails a month. Please let us know if you'd like to join the mailing list by emailing us at prif@hse.gov.uk – all we need is an email address.

What do the results show overall?

The vast majority of food tested in 2017 complied with legal limits (MRLs):

- 53% of samples contained none of the pesticides being looked for;
- 43.7% of samples contained residues at or below the MRL;
- 3.3% of samples contained residues above the MRL.

There were few residues that we thought were of possible concern for consumers' health:

- 28 detailed risk assessments were carried out in 2017;
- In most cases there was unlikely to be a risk to people's health.

Are you finding more residues year-on-year?

Proportionally, the number of residues above the legal MRL and instances of residues which we think are of concern for consumers' health show little variation.

Over the years, as the knowledge and equipment of laboratories improves, we are increasingly able to test for more pesticides at lower amounts and so we do find more. A typical fruit and vegetable survey undertaken in 2003 by PRiF's predecessor, the PRC (Pesticide Residue Committee), looked for just over 150 pesticides; in 2017 we looked for over 370 individual pesticides.

How can residues above the legal limit (MRL) still be safe?

MRLs are legal limits, not safety limits. Residues above the MRL are not necessarily therefore a cause for health concern.

MRLs are set at a level consistent with good agricultural practice and consistent with using the pesticide as authorised. Authorisation considers issues such as the personal safety of those exposed to the pesticide and environment safety as well as safety for consumers. That means that MRL levels are often set far below levels that might otherwise be set just on consumer safety grounds alone.

All detected residues are screened for safety issues, whether or not they are above the MRL.

Do you consider the risk to children?

Yes. Our risk assessments consider the risk to several different groups of consumers (people who eat the relevant food) which includes various age groups including infants and children. As part of the risk assessment we take account of:

- the different eating habits, including the amounts of food that different people might eat;
- people's different sizes (bodyweights and growth stages).

About the survey programme and the samples

Do you test imported food?

Yes. Imported food including food from Europe is part of the monitoring programme because it is part of the UK's general food supply.

We try to include imported samples in all surveys of any food roughly in proportion to the UK market share of the food. For example, when we survey bananas all the samples will be imported, but for swedes and turnips almost all samples will be from the UK.

Do you test baby food and baby milk?

Yes. Every year we test at least one sort of baby food or baby milk. We also take into account the law on pesticides residues in these special foods. They are separate, different legal controls for these foods which are intended to be extra precautionary.

You can find out more about the rules for baby food and baby milk at www.gov.uk/government/publications/infant-formula-and-foods-for-particular-nutritional-uses-parnuts-notification-requirements

Do you test organic food?

Yes. Organic food is part of the monitoring programme because it is part of the UK's general food supply. Our laboratories check many different foods for pesticide residues and organic samples are included amongst them. We try to include organic samples in all surveys of any food roughly in proportion to the UK market share of that food.

We consider whether any residues found could be a risk to consumer health and if so also consider what action should be taken.

Some pesticides are allowed to be used in organic food production as well as in conventional (non-organic) farming. When we test foods, we test all the samples of the same sort of food for the same range of pesticides.

We are not responsible for checking compliance with organic rules. So when we find residues of pesticides in organic foods we send those findings through to the relevant organic certification company.

Do you test samples from all across the UK? Who collects your samples?

Yes. All year, every year, we collect samples from retail outlets across the UK. We change the particular locations used every year, as shown in our annual reports. We use market research shoppers at retail outlets for most of our surveys.

For some surveys, government inspectors collect samples from various points in the supply chain (such as ports, depots and pack houses) in England and Wales only. Plant Health and Seed Inspectors collect samples of potatoes, and Horticultural Marketing Inspectors collect samples of fresh fruit and vegetables.

How do you decide which foods to sample at retail (supermarkets and other shops) and which to sample from the food chain including wholesalers?

We tend to use inspectors to collect food at wholesale markets, import points and processing plants for foods that are:

- not routinely stocked by most retailers and even then often not stocked in large enough quantities to buy a sample – examples include okra, eddoes, quince and mooli (daikon);
- often sold loose at retail, which makes it harder for shoppers to collect traceability information – examples include oranges and grapes.

We also use inspectors to collect samples of food where previously there have been compliance issues which have led to them being considered as a higher overall priority within the programme.

How do you decide where to get retail samples? Why do you keep coming to my shop?

We ask our shoppers to behave like normal shoppers. Our shoppers are based in a particular location, so that means they will go to the same supermarkets, greengrocers, butchers and so on throughout the year.

Our aim is to get a snapshot that broadly reflects the market share of different chains and types of shops. We broadly collect in line with market share. We check to make sure that no particular retail chain or type of shop has been noticeably over or under represented.

We schedule special shopping trips to independent outlets – market stalls, independent greengrocers, butchers and bakers, farm shops and so on.

How do you decide where to get samples from the non-retail parts of the food chain, such as wholesale markets and packers?

We ask the inspectors we use to collect samples alongside their normal work.

Horticultural Marketing Inspectors make sure that fresh fruit and vegetables are labelled with the right class standard (for instance 'class 1'). As well as working at wholesale markets they visit ports, airports, packing houses and shops.

Plant Health and Seed Inspectors have a wide range of duties relating to plant health. This includes checking that potatoes are free of diseases that could spread to growing potatoes and devastate harvests. They visit potato stores, potato packers, ports, airports, processors (for instance crisps and frozen chip factories) and farm shops.

What exactly do you tell shoppers and inspectors to do? What are the protocols for collecting samples?

Our protocols – or instructions to samplers – are based on international guidelines, which tell us everything about taking samples. As well as the size and make-up of the samples that we have to test, it tells us what a lot is and how many points in the lot we need to sample from.

We produce new sampling instructions every year for that year's programme, and if necessary we update them throughout the year. We don't publish these online as they go out of date so quickly. If you have any detailed questions or particular concern about the way a food is sampled, please do get in touch.

How much is a sample? For instance, is a sample of apples one apple?

To ensure results are comparable, we follow international guidelines on the size and make-up of the samples we test. We slightly increase the amounts recommended, to allow for things like miscounting and variation in weighing scales, otherwise the laboratory would have to reject the samples.

For example, for apples the guidance says a sample must be made up of at least 10 apples and must weigh at least one kilogram. We ask our samplers to get 12 apples and at least 1.2 kilograms to be on the safe side.

How do you prevent cross contamination during sampling and transport?

Our shoppers shop like ordinary shoppers; that includes wrapping and packing foods appropriately. Our shoppers and inspectors also wrap and pack samples with bubble wrap to prevent breakage and leakage in transit. Analysts expect this to be sufficient to prevent contamination. Samples are sent to the laboratory by a next-day courier service. If the laboratory thinks that contamination has occurred or that the contents have deteriorated in transit, then those samples are rejected.

About the tests (analysis)

What pesticides do you test for?

Most years our laboratories increase the number of pesticides they test for. This is driven by changes in the law about pesticides as much as improvements in analytical technology and techniques.

The actual pesticide tested for in each food also depends on the chemistry of that food. Some foods are

just harder to analyse than others; they may be fatty, acidic, highly coloured or aromatic, all of which can affect the isolation and identification of the pesticide.

We publish details of the planned monitoring programme every year which includes information on pesticides we plan to test for. In our quarterly reports, we publish lists of all the pesticides we looked for but didn't find as well as the pesticides we did find.

Are your laboratories UKAS accredited? Are they accredited for all the tests they do for the programme?

Yes. Legislation requires all official laboratories to be appropriately accredited. HSE interpret that to mean that all results should be from tests covered by the laboratory's UKAS (United Kingdom Accreditation Service) accreditation under ISO/IEC 17025.

Do you test for neonicotinoid pesticides?

Yes. Our standard tests for fruit and vegetables include certain neonicotinoid pesticides. Other foods are also tested for certain neonicotinoids where appropriate. Each individual pesticide is tested for and reported separately and each has its own separate MRL.

Do you test for endocrine disrupting chemicals (EDCs)?

Endocrine disruption has only recently been recognised as a potential problem (although data is already available about the possible effects of pesticides on reproduction including offspring).

The EU's scientific criteria for determining whether something is an endocrine disrupting chemical hasn't been finalised yet. Whatever the definition chosen, it is almost certain that we test for some pesticide residues that will fall into that or indeed other definitions.

Each individual pesticide is tested for and reported separately because each has its own separate MRL.

Where can I find out more about laboratory procedures and practices?

Our laboratories follow the latest version of *Method Validation and Quality Control Procedures for Pesticide Residues Analysis in Food and Feed* as published by the Reference Laboratories for Pesticide Residues. UKAS checks that our laboratories are following these rules as part of their accreditation checks.

How do the laboratories make sure the results are not due to cross-contamination or interference?

Our laboratories follow the rules for this in the analytical guidance. Any possible cross-contamination or interference is addressed during our Analytical Sub-Group's consideration of results.

About PRiF

Who are the members and who do they represent? Have they made declarations of interest?

We are appointed by Defra for our expertise to provide independent advice to the government. We do not act as representatives for particular sectors. We receive a basic fee and expenses for this work.

We have published a list of members including our biographical details as well as our declarations of interest.

What are your terms of reference?

Our terms of reference are:

To advise ministers, the Health and Safety Executive (HSE) 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 and new methods of analysis.

The Committee will make its findings and recommendations available to government, consumers and the food and farming industries in a way which aims to be comprehensive, understandable and timely.

24. Contact details

Expert Committee on Pesticide Residues in Food (PRiF)

Expert Committee on Pesticide Residues in Food
Chemicals Regulation Division
Health and Safety Executive
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Website: https://www.gov.uk/government/groups/expert-committee-on-pesticide-residues-in-food-prif

Email: prif@hse.gov.uk

Food Standards Agency (UK Headquarters)
Food Standards Agency
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Website: https://www.food.gov.uk/

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Health and Safety Executive (HSE)

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