



Federal Office of
Consumer Protection
and Food Safety



“Pesticide residues in food”

National reporting 2017 Federal Republic of Germany – condensed version



Summary

The report presents the results of the analysis of food for pesticide residues. In accordance with Regulation (EC) No 396/2005, the compliance with current legislation was checked and analyses to assess consumer exposure were carried out.

In 19 official laboratories of 16 federal states, 20,202 food samples were analysed for the presence of pesticide residues. 5,328 of these samples were taken at random in the framework of the monitoring programme, in order to be able to make representative statements about consumer exposure. However, with regard to the selection of the other samples, foodstuffs known for presenting higher risks were preferred. For this reason, the results do not allow to draw conclusions on the contamination level of the entirety of all foodstuffs available on the market.

For reporting to the European Food Safety Authority (EFSA) and the European Commission, the samples are divided in "surveillance" and "follow-up enforcement" samples. The routine and monitoring samples are denominated as "surveillance" samples, while suspect samples, complaint samples and persecution samples are summarised as "follow-up enforcement" samples.

In the reporting year, a total of 19,406 samples fall under the category "surveillance" and 796 samples under the category "follow-up enforcement".

In 2017, 1,797 samples were analysed in the framework of the coordinated multi-annual Community control programme. These samples were part of the 20,202 samples analysed in total.

Table of contents

1	Information about maximum residue levels.....	4
2	Food-related view on the results	4
3	View with regard to origin.....	7
4	Substance-related view on the results	7
5	Findings of multiple residues	8
6	Substances which are proven to (mainly) not stem from pesticide use	8

Cover picture: © Fotolia/EwaStudio

1 Information about maximum residue levels

"Maximum Residue Level" (MRL) means the upper legal level of a concentration for a pesticide residue in or on food. For setting MRLs, data on the toxicology of the substance and on the intake quantity of the respective foodstuff as well as data from field studies carried out in accordance with good agricultural practice are taken into consideration.

The report distinguishes between the exceedance of a MRL and the objection (non-compliance) of samples. Not all samples with MRL exceedances are objected (non-compliant) by the respective responsible authority, as for an objection (non-compliance) further arguments like the analytical measurement uncertainty have to be taken into account.

When it is established that a consumer risk through pesticide residues in a foodstuff cannot be excluded, the European Rapid Alert System for Food and Feed (RASFF) is notified, so that all responsible authorities in the EU are informed accordingly.

In 2017, Germany issued 11 notifications due to pesticide residues; one of these was an alert.

2 Food-related view on the results

(only "surveillance" samples without substances which are proven to (mainly) not stem from pesticide use: chlorate and the quaternary ammonium compounds (QAC) didecyl-dimethylammonium chloride (DDAC) and benzalkonium chloride (BAC))

In total 202 different foodstuffs were analysed. As every year, the majority were fruit and vegetables.

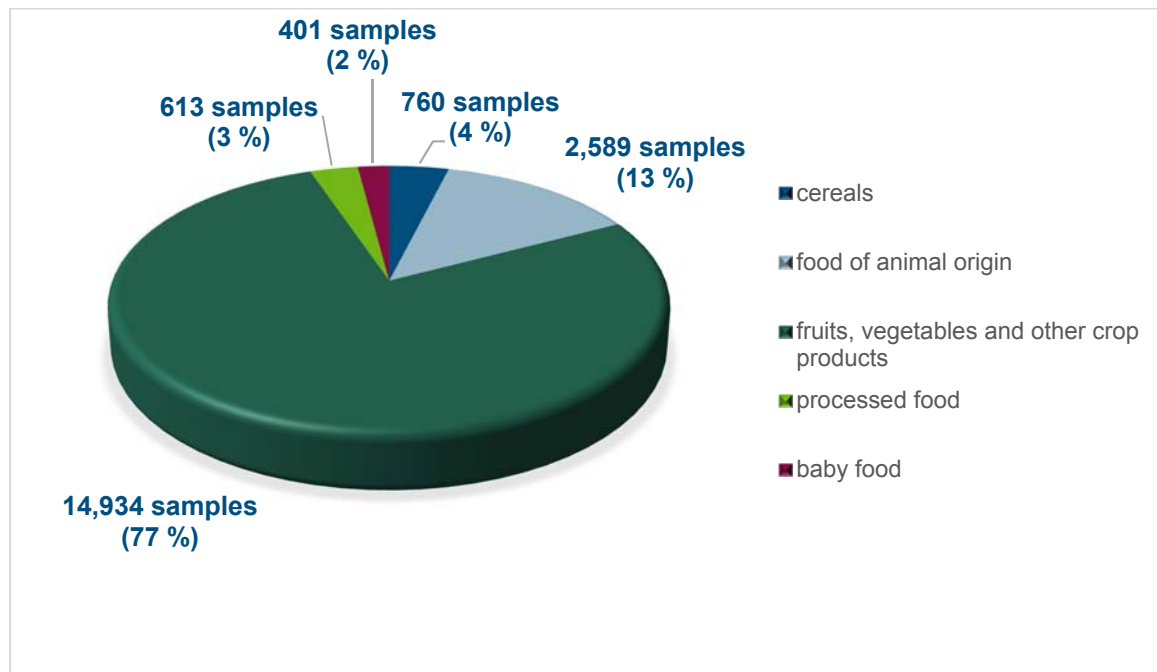


Figure 1: Distribution of sample numbers between food groups

Chicken eggs (1,176 samples), strawberries (749 samples), potatoes (703 samples), apples (644 samples), tomatoes (532 samples), carrots (530 samples), green salad (516 samples) and poultry meat (513 samples) were analysed the most frequently.

Table 1: Residues in food groups

Food group	Number of samples				
	total	with residues < LOQ (limit of quantification)	with residues < MRL	> MRL not objected	> MRL objected
Cereals	760	448 (58.9 %)	312 (41.1 %)	23 (3.0 %)	12 (1.6 %)
Food of animal origin	2,589	1,813 (70.0 %)	776 (30.0 %)	49 (1.9 %)	22 (0.8 %)
Fruit, vegetables and other products of plant origin	14,934	5,139 (34.4 %)	9,795 (65.6 %)	380 (2.5 %)	199 (1.3 %)
Processed food	613	314 (51.2 %)	299 (48.8 %)	16 (2.6 %)	11 (1.8 %)
Food for infants and young children	401	362 (90.3 %)	39 (9.7 %)	6 (1.5 %)	6 (1.5 %)
Total	19,297	8,076 (41.9 %)	11,221 (58.1 %)	474 (2.5 %)	250 (1.3 %)

In the category food for infants and young children, 1.5 % of the samples contained residues above the MRL. 6 of 6 samples were objected. In 5 of these 6 samples (3 of them were processed fruit for infants and young children) high fosetyl levels above the MRL were detected. Residue definition of fosetyl includes the lead compound fosetyl as well as the metabolite phosphonic acid and their salts. It should be noted that phosphonic acid can be present as a degradation product of the fungicide fosetyl but can also originate from other sources.

For fruit and vegetables the range of pesticide contaminations was particularly large, spanning from foodstuffs in which no residues were quantified, to products with objection rates of 90.0 % (Asiatic pennywort) respectively 83.3 % (morning glory). However, the foodstuffs with objection rates of more than 10 % were mainly exotic fruits and vegetables like the mentioned Asiatic pennywort and morning glory, as well as granate apples, lychees, papayas and okra.

Fortunately, many foodstuffs with particularly high intake like potatoes, carrots or apples only had few MRL exceedances and objections.

Table 2 summarises the fruit and vegetable products without any objections in at least 100 analysed samples.

Table 2: Fruit and vegetables with the lowest number objections in 2017 (>100 samples)

Food	Number of analysed samples	Objections (%)
Carrots	529	0.0
Tomatoes	524	0.0
Spring onions	261	0.0
Lamb's lettuce	253	0.0
Pumpkin	237	0.0
Onions	236	0.0
Plums	222	0.0
Brussel sprouts	173	0.0
Lime	131	0.0
Mangos	131	0.0
Pine nuts	110	0.0
Sesame seeds	102	0.0
Pumpkin seeds	101	0.0

The ten foodstuffs with the highest objection rates are presented in Table 3 (at least 100 samples).

Table 3: Fruit and vegetables with the highest number of objections in 2017 (>100 samples)

Food	Number of analysed samples	Objections (%)
Tea (black and green)	217	7.4
Fresh herbs	245	7.3
Sweet pepper	421	5.5
Grapefruit, pomelo	100	4.0
Beans (with pods)	339	3.8
Currants (black, red, white)	218	3.2
Blackberries	204	2.9
Beans (dried)	126	2.4
Aubergines	125	2.4
Pepper	147	2.0

Also in 2017, organic products were controlled for residues. The contamination of these samples was much lower than that of conventionally produced samples. Only 22.7 % of the products stemming from organic farming contained residues, which could be quantified analytically – compared to 58.1 % of other products.

3 View with regard to origin

(“surveillance” samples and “follow-up enforcement” samples without chlorate and QAC)

20,084 samples were controlled, 45 % thereof from Germany, 27 % from other EU Member States and 16 % from Third Countries. 12 % of the samples were of unknown origin.

More than three fifths of the samples were purchased from retail food traders and about less than one fifths from wholesalers. The rest was bought from growers, manufacturers and packers as well as from service providers, e.g. restaurants or delivery services.

Big differences can be observed in the contamination level of foods with pesticide residues depending on their origin. In 2017 maximum residue levels were exceeded in 1.1 % of the analysed products (only “surveillance sampling”) from Germany and in 1.9 % of the analysed products from other EU Member States. With regard to products from Third Countries, this was the case in 6.3 % of the samples. Nevertheless, the percentage of samples without any quantifiable pesticide residues is still the highest in German foodstuffs.

4 Substance-related view on the results

(“surveillance sampling“ and “follow-up enforcement sampling“)

The range of pesticide substances tested for in 2017 comprised 999 different substances (including the legal residue definitions of sums, their metabolites and isomers). In previous years, the number of active substances according to their legal residue definition was counted (without metabolites and isomers). Therefore this year’s evaluation cannot be compared with previous years. This change became necessary due to an increasing number of complex residue definitions and varying residue definitions depending on the foodstuff. Only in this way was it possible to disclose all data without losses.

Obviously, no sample was analysed for all substances. On average, each food sample was analysed for 346 different substances.

559 of the 999 substances were not found in quantifiable quantities in any sample. On the other hand, for 153 substances residues above the valid maximum residue levels were detected.

The most noticeable substances among the 694 stated MRL exceedances were the trimethyl-sulfonium cation, fipronil (sum, only for foodstuffs of animal origin), nicotine and fosetyl.

The trimethyl-sulfonium cation is a potential counterion of the systemic total herbicide glyphosate that is still only used in third countries. Due to extended analytical possibilities, the trimethyl-sulfonium cation was first intensively investigated in 2013 and correspondingly frequently detected, so that sampling was permanently established.

In July 2017, numerous exceedances of the MRL for the insecticide fipronil in eggs and poultry meat were reported by the European Rapid Alert System for Food and Feed (RASFF). The increased residue levels of fipronil were due to the illegal use of fipronil-containing disinfectants. Exceedances of the MRL were detected in a total of 27 Member States of the European Union.

Since 2010 nicotine is banned for pesticide use in the EU due to its high toxicity. Therefore, the causes of the occasionally noticeable nicotine residues in fruit and vegetable products are still unclear.

Since the fungicide fosetyl is analysed together with its degradation product phosphonic acid, it cannot be decided whether the positive findings are due to a treatment with the fungicide or stem from other sources.

5 Findings of multiple residues

(“surveillance sampling“ and “follow-up enforcement sampling”)

In 37.0 % of all samples, more than one substance was detected in quantifiable quantities. The percentage distribution of the number of quantified residues is presented in the following:

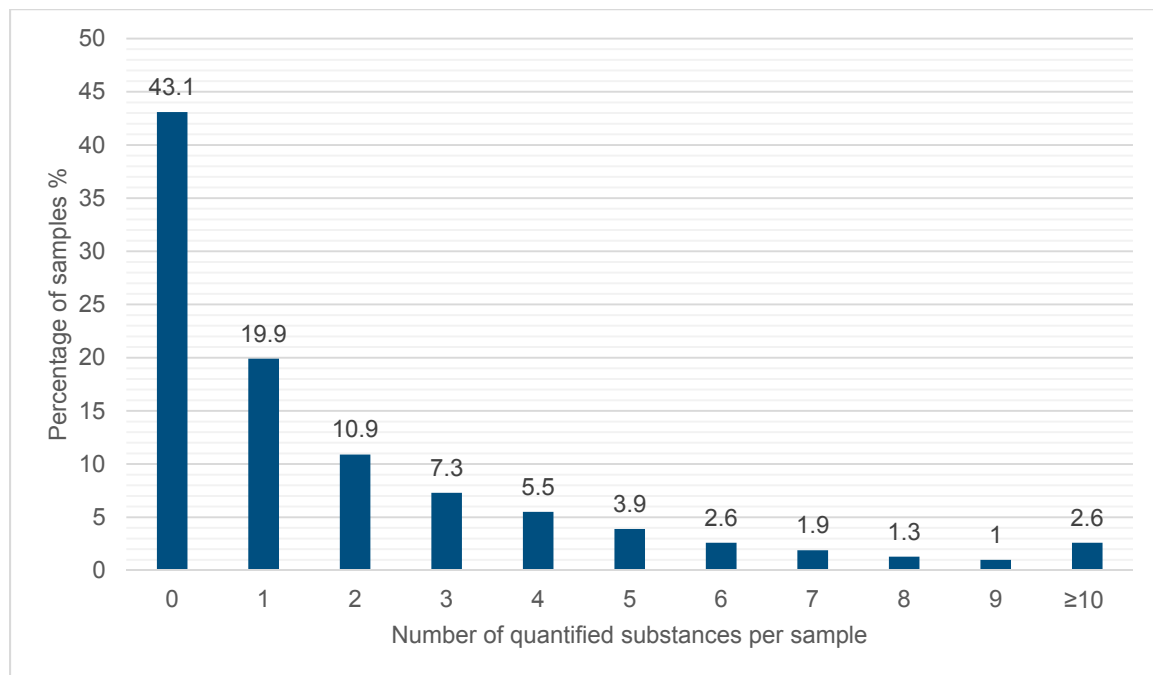


Figure 2: Percentage of samples without any residues or with residues of 1 to ≥10 substances.

Multiple residues above 75 % were found particularly in currants, strawberries, blackberries, oranges, peaches and grapefruits/pomelos.

6 Substances which are proven to (mainly) not stem from pesticide use

Some substances are legally regulated as pesticides, but their residues mainly originate from other sources than pesticide treatments. In order not to distort the overall picture of pesticide contamination, the quaternary ammonium compounds didecylmethylammonium chloride (DDAC) and benzalkonium chloride (BAC) as well as chlorate are treated separately in the report.

Residues of chlorate can enter the food during processing, e.g. through washing and disinfection steps.

In 2017, chlorate was quantified in 12.8 % of the samples. In 6.2 % of the samples, residues above the maximum residue level were found. Chlorate was mainly objected in 'processed food' (10.2 % of overall 98 samples).

Also in the category 'fruit and vegetables' (a total of 4.723 samples) and 'food for infants and young children' (a total of 165 samples) several samples (2.1 %) respectively one sample (0.6 %) were/was objected for containing too much chlorate.

In products from organic farming, the residue situation with regard to chlorate is better than in conventional products. Only in 3.8 % of the samples from organic origin chlorate residues above the maximum residue level were found.

Quaternary ammonium compounds are used for example to disinfect milking plants and tanks. For this reason, they are often detected in dairy products. In 2017, residues of DDAC and/or BAC above the maximum level were analysed in 6.3 % of foodstuffs of animal origin.

In products from organic farming, the residue situation with regard to DDAC and BAC is also better than in conventional products.