Issue 2018

monitoringreport

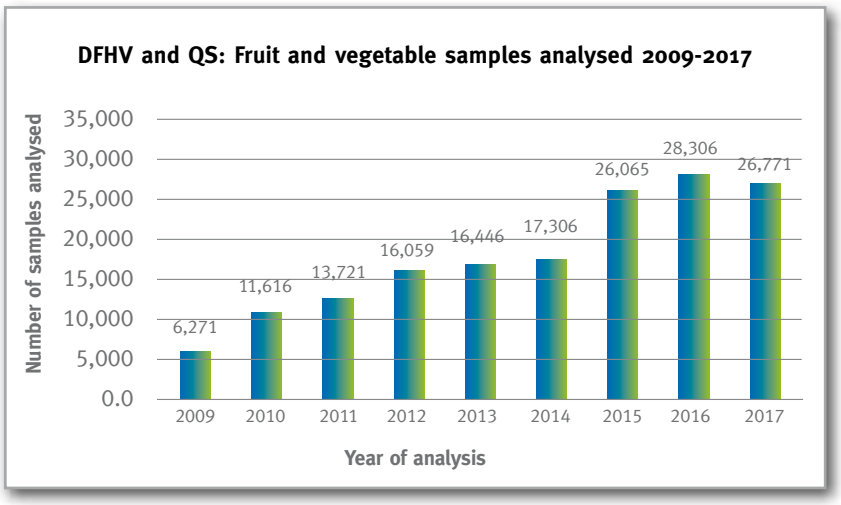
A Publication of QS Fachgesellschaft Obst-Gemüse-Kartoffeln GmbH and DFHV Deutscher Fruchthandelsverband e.V

DFHV and QS: Keeping an eye on the residue situation together for the ninth time

In 2007 the **Deutsche Fruchthandelsverband e.V. (DFHV)** became a co-partner in the **QS Fachgesellschaft Obst-Gemüse-Kartoffeln GmbH.** This accession not only strengthened the professional exchange between the two organisations, but also laid the foundation for what has become a successful collaboration in the quality assurance of fruit and vegetables spanning ten years.

Between 2009 and 2014, an average of 13,500 fruit and vegetable samples have been examined per year as part of the QS and DFHV monitoring programme for pesticide residues, as well as for additive and contaminant content - and this figure continues to rise. With more than 27,000 samples analysed per year in the last three years, volume has even more than doubled.

Since 2009, the DFHV and QS have been evaluating their analysis data jointly and publishing the results in the annual monitoring report. To date, a total of 162,561 samples have been jointly evaluated in the monitoring programmes. This has made a decisive contribution to increasing transparency regarding the situation surrounding residues in fresh fruit and vegetables.



More than 26,000 fruit and vegetable analyses

Current figures at a glance

- **Evaluation period:** 1 October 2016 to 30 September 2017
- **Total number of samples analysed:** 26,771
- **Number of sample countries:** 73
- **Samples with no active substances detected:** 11,147 (41.6 percent)
- **Samples with active substances:** 15,624 (58.4 percent)
- **Rejected samples due to maximum residue level (MRL) exceedance*:** 681
- **Rejection rate (overall):** 2.5 percent
  - o **Rejection rate, Germany:** 0.8 percent
  - o **Rejection rate, EU (not including Germany):** 2.0 percent
  - o **Rejection rate, non-member countries:** 5.9 percent

*Based on the actual value (measured without taking an analytical measurement uncertainty of ±50 percent into account).

Number of analysed samples per continent (top-10)

Africa

Number of samples (total): 2,747
Number of samples without complaint: 2,562
Rejection rate: 6.7 %

	Samples per country	Rejected samples
Madagascar	842	121
South Africa	746	11
Morocco	474	17
Egypt	252	11
Kenya	163	14
Zimbabwe	68	6
Ivory Coast	66	3
Senegal	39	0
Namibia	30	0
Ethopia	22	2

North-/South America

Number of samples (total): 3,054
Number of samples without complaint: 2,917
Rejection rate: 4.5 %

	Samples per country	Rejected samples
Brazil	858	57
Chile	585	15
Peru	530	25
Colombia	283	26
Ecuador	202	3
Costa Rica	136	6
Mexico	119	1
Argentina	105	1
Dom. Republic	62	2
USA	44	0

Europe

Number of samples (total): 19,357
Number of samples without complaint: 19,112
Rejection rate: 1.3 %

	Samples per country	Rejected samples
Germany	11,375	86
Spain	3,348	45
Italy	1,438	59
Netherlands	1,296	8
Belgium	1,040	26
France	242	5
Greece	164	5
Austria	164	1
Portugal	79	0
Denmark	49	0

Asia/Pacific

Number of samples (total): 1,613
Number of samples without complaint: 1,499
Rejection rate: 7.1 %

	Samples per country	Rejected samples
Turkey	461	53
India	434	10
Israel	314	19
China	225	18
New Zealand	82	0
Thailand	33	7
Vietnam	30	7
Malaysia	23	0
Indonesia	4	0
Australia	2	0

Further details on the current analysis results can be found on page 4.

High sense of responsibility and good professional practice among producers

Dr. Hermann-Josef Nienhoff
Managing Director QS
QS Qualität und Sicherheit GmbH

The new edition of the monitoring report once again stands testament to the high sense of producer responsibility within the QS scheme and amongst DFHV member companies. The current analysis shows that the consistent implementation of the guidelines on the use of plant protection products and pesticides, along with good professional practice by producers pays off: over 97 percent of all samples analysed were below the permitted maximum residue levels. At the same time, this positive result highlights the added value provided by the QS and DFHV monitoring programmes for the industry and for consumers: the continuous improvement of the residue situation concerning fruit and vegetables in recent years has strengthened the trust between trading partners and has boosted customer confidence in safe, high quality foodstuff.

Dr. Andreas Brügger
Managing Director DFHV
Deutscher Fruchthandelsverband e.V.

Table grapes

Whether white, red or black, table grapes are among the most popular fruits. These little round energy providers admittedly have a lower vitamin content than many other fruits, but the flavonoid fisetin contained in them helps keep our memory sharp.

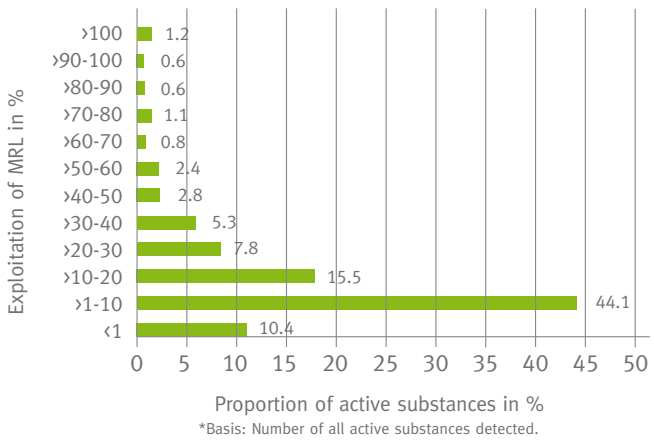
From a total of 1,198 samples from 14 countries, 80 percent came from non-EU countries, more than half of them from India and South Africa alone, followed by Chile, Brazil, Egypt and Peru. EU produce came mainly from Italy. About 60 percent of all samples contained between only one and three active substances, another 15 percent had four. Samples with more than five active substances originated mainly from Chile, South Africa and India, but some EU produce was also affected.

Plant protection products were detected in almost all samples, only 7 percent were residue free. Nevertheless, 70 percent of the active substances only exploited the maximum permitted residue level up to a maximum of 20 percent. Eight samples from India containing the active substances acephate (2 x) and nitenpyram (6 x), three samples from South Africa (DDAC, ethephon, spirotetramate) and two samples respectively from Chile (phosmet, dicloran), Peru (BAC) and Italy (formetanate) were among the number of only 17 rejected samples (1.4 percent).

By far the most commonly detected substances were dithiocarbamates (as CS2), followed by sulphur dioxide (SO2), which is used against mould and spoilage in packing houses, as well as in sulphur pads used during transport. One in three to four samples contained the growth regulators ethephon, chlormequat or mepiquat, one in five samples contained the insecticide spirotetramate.

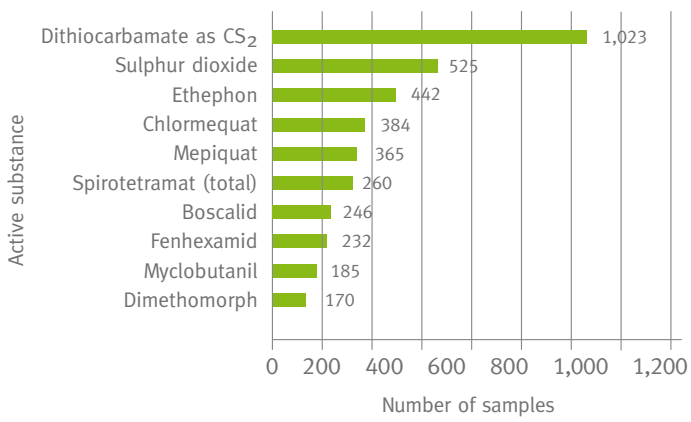
In 2010 increased residues of chlormequat (CCC) in Indian table grapes attracted attention. Through the storage of CCC in the vine wood, the active substance can still be detected in the fruit in subsequent years (so-called “carry-over”). In 2017, the EU Commission responded to the persistence of CCC even in table grapes and extended the maximum limit (0.05 mg/kg) until July 2019.

Table grapes: Percentage of MRL exploitation of active substances*



*Basis: Number of all active substances detected.

Table grapes: Most frequently detected active substances (top-10)



Peaches

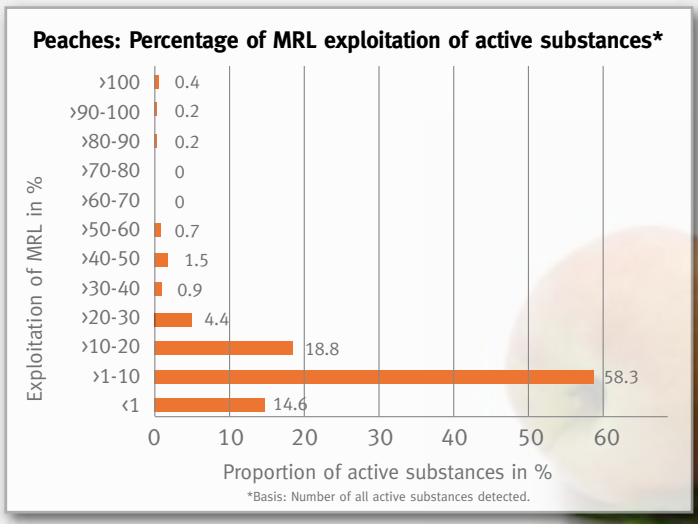
Juicy, sweet and delicious: The peach is one of the most seductive fruits of all and is even healthy to boot. Its furry skin, however, is not popular with everyone but provides effective protection for the fruit from extreme sunlight, frost and tiny insects.

In total, 169 samples from five countries of origin were analysed, the majority of which came from Spain (132 samples), followed by Italy (29 samples).

Pesticide residues were detected in almost all samples. Of these, over 60 percent were found to contain only one to three active substances. The completely residue-free samples (9 percent) were from produce exclusively from Spain. Where active substances were detected, 96 percent of these only exploited the maximum residue limits by up to 30 percent. Only two samples (origin Spain) exceeded the maximum levels, putting the rejection rate at 1.2 percent. The substances concerned here were the insect repellent diethyltoluamide (known as DEET) and the active substance chlorpyrifos (insecticide/acaricide).

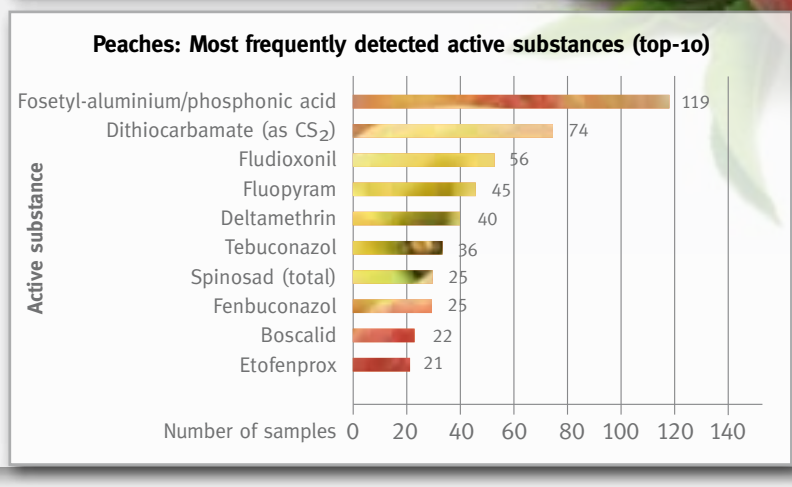
The most frequently detected active substances were mainly fungicides, in 70 percent of all samples it was fosetyl-aluminium (119 samples). Since the existence of fosetyl can have its origins in other sources (fertilizer, plant strengthening agents, etc.), it is not a clear indication of active plant protection product application (for more information on fosetyl-aluminium, see info box on page 4). One in three samples contained fludioxonil, one in four samples contained fluopyram, and one in five samples contained tebuconazole. The insecticides included deltamethrin, spinosad and etofenprox.

Peaches: Percentage of MRL exploitation of active substances*



*Basis: Number of all active substances detected.

Peaches: Most frequently detected active substances (top-10)



Melons

Thanks to their high water and low-calorie content, melons are among the most popular vitamin providers during the summer months. From a botanical point of view, however, Honeydew melons & Co. are classed as cucurbits, which strictly speaking are vegetables.

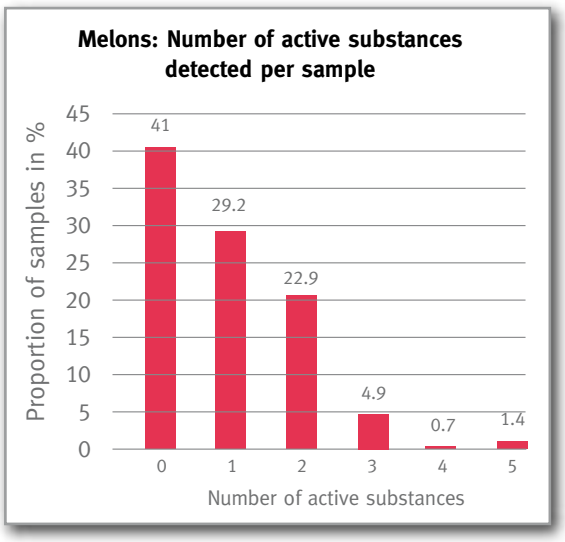
Half of the total of 144 melon samples came from Spain alone, followed by Italy and France. Therefore EU produce accounted for almost three quarters of the total sample volume. Non-EU produce came from Brazil, Costa Rica, Honduras and Morocco.

Positive conclusion: 41 percent of the samples were free from any residue, including more than half of all Spanish melons - amongst which none were found to exceed maximum residue limits either. Another 52 percent were found to contain only one or two active substances. The active substance levels were found to be well below the limit values in 85 percent of all analysis results and were found to be at a maximum of 30 percent of the fixed MRL.

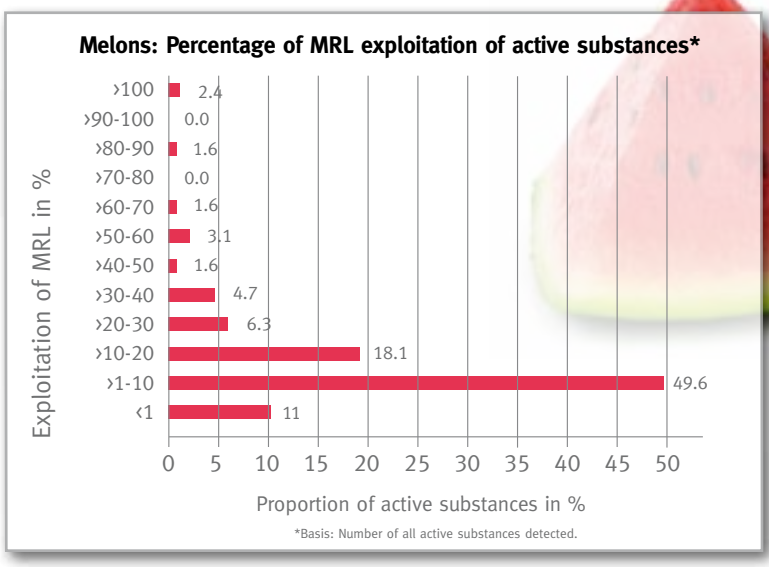
Four active substances were found in only one sample from Italy and the two samples with five active substances originated from Honduras and Spain. The fungicides propamocarb and imazalil were most commonly found (1 in every 8 samples) and the insecticides acetamiprid, flonicamid and imidacloprid were established in 9 to 11 percent of all samples.

In two objected samples, the maximum limit was exceeded by a rate of 1.4 percent. This related to one of the four samples from Morocco (propiconazole, pyrimethanil) and one sample from Italy (flonicamid).

Melons: Number of active substances detected per sample



Melons: Percentage of MRL exploitation of active substances*



*Basis: Number of all active substances detected.

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Iceberg lettuce

It undoubtedly also owes its name to its crispy crunchiness. However, the name "Iceberg lettuce" harks back to a time when this lettuce variety was transported over long routes on large blocks of ice, keeping them cool and ensuring they survived the journey keeping crisp and fresh.

In total, 381 iceberg lettuce samples from six countries were examined. More than 99 percent of the samples analysed came from the EU, with the majority coming from Spain (217 samples) and Germany (154 samples). In addition, seven samples from the Netherlands and one sample from Italy were included in the analysis. Two samples analysed came from non-EU countries. The good news is that in nearly half the lettuce samples (48.8 percent) no plant protection product residues were detected at all. In over 30 percent of the remaining samples only a single substance was found and two active substances were found in a further 12.1 percent. Positively it is worth emphasising that 98.9 percent of the active substances found were at levels below 10 percent of the maximum permitted level and in none of the cases rose above 50 percent of that tolerated value.

The insecticide imidacloprid was the most commonly found substance (77 instances), then spirotetramate (63 instances), as well as the fungicide metalaxyl, which was detected a total of 45 times.

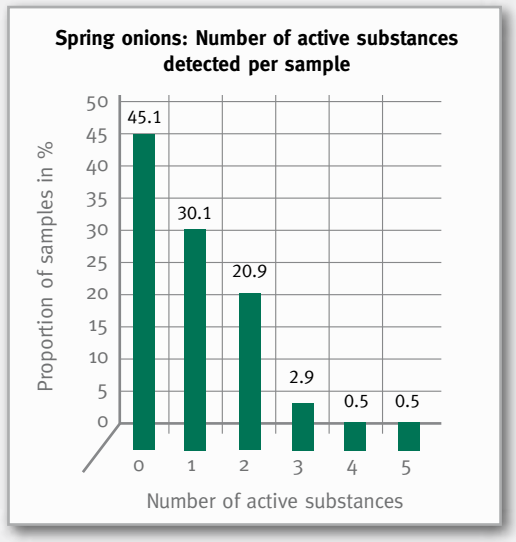
Spring onions

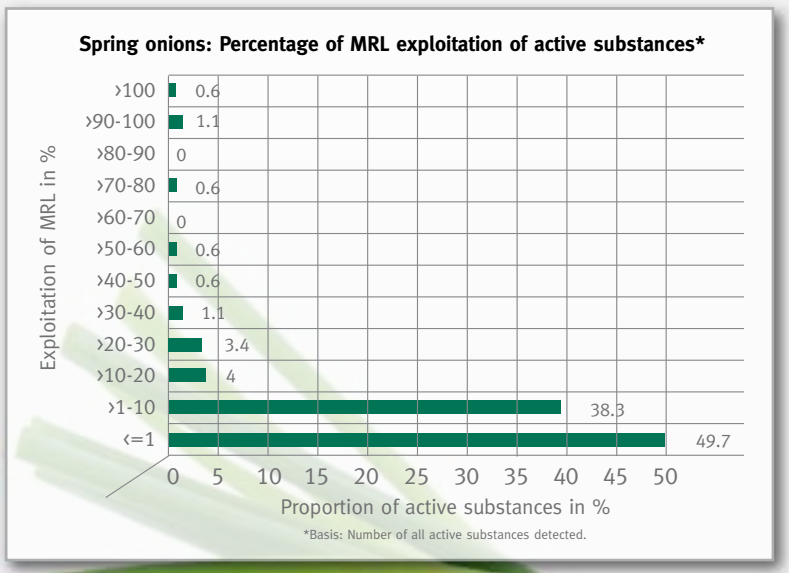
Tall and slender with delicate, white heads - the spring onion not only differs in appearance from the common, bulb onion. In contrast to its "big sister", they are considerably milder and less likely to make you cry.

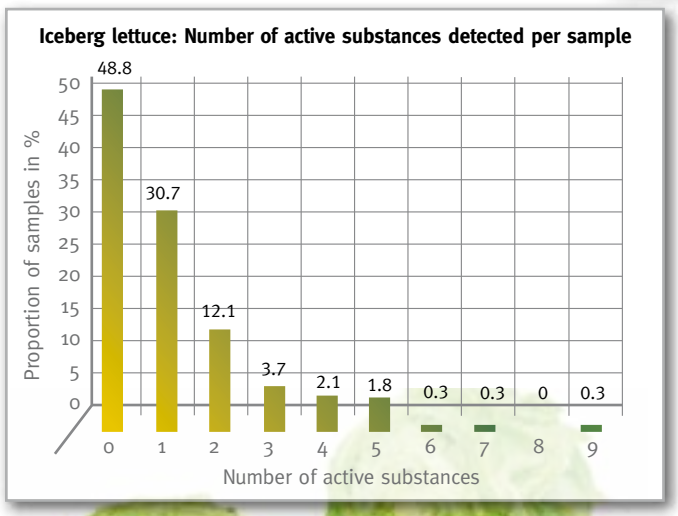
206 samples from seven countries were examined for plant protection product residues during the study period. The vast majority of samples came from Germany (160 samples), followed by Egypt (31) and Italy (13). In addition, one spring onion sample from the Netherlands and Spain respectively was analysed.

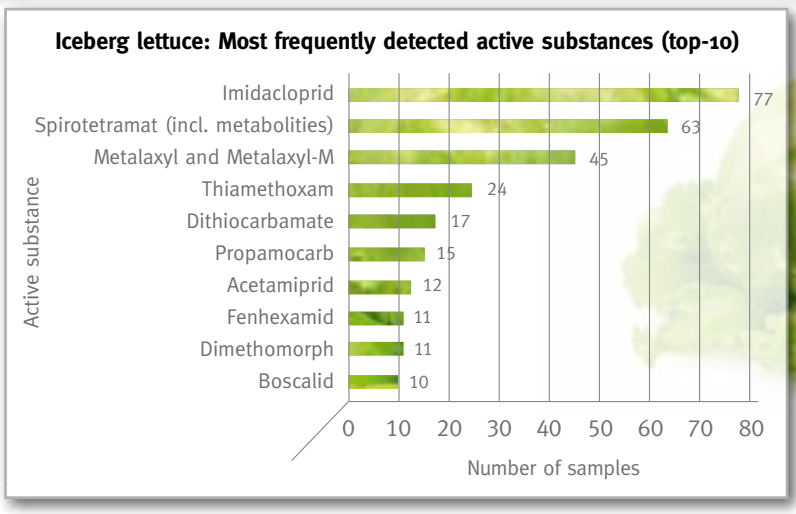
The analysis data for spring onions makes a good impression: no pesticide residues at all were detected in 45.1 percent of the samples analysed. In addition, more than 50 percent of the samples in which residues were found only contained two or less active substances. Four different active substances from plant protection products were detected in only one single sample from Germany. Another sample from Italy contained five different active substances. Overall, a large number of different active substances were identified in the analysis, whereby the most commonly found were dimethomorph (59 instances) and iprodione (56), both belonging to the group of fungicides.

A positive image is reflected in the evaluation of maximum residue levels (MRLs): 88 percent of the active substances found were at levels up to only 10 percent of the maximum legally permitted levels. One spring onion sample from Italy had to be rejected due to a massive MRL exceedance regarding the fungicide procymidone. The level was 7.5 times the maximum.









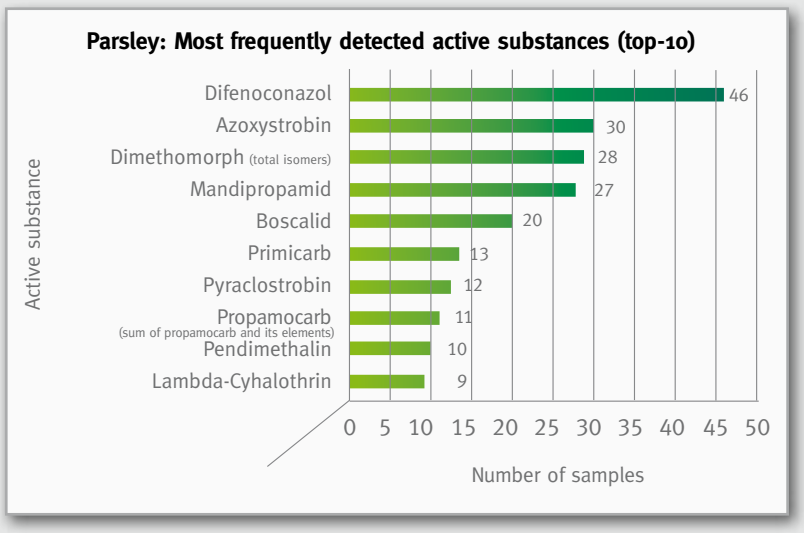
Parsley

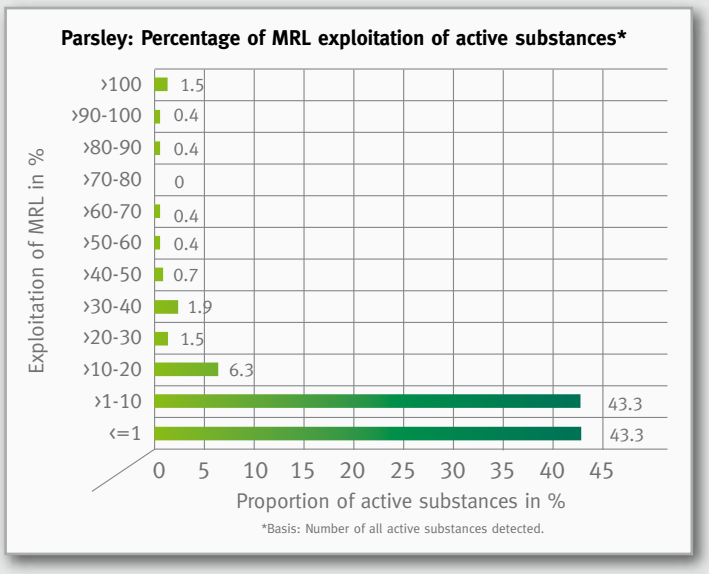
Parsley is one of the most traditional herbs in the kitchens of Europe. Its aromatic leaves not only impress with a fresh and spicy taste, but also contain considerable amounts of vitamins A, B1, B2, C and E.

Most of the total of 175 parsley samples came from the EU, more precisely from Germany (139 samples) and Italy (25 samples). Also included were five samples from both Portugal and Morocco, as well as one sample from Israel.

33.7 percent of the samples examined were found to contain no active plant protection substances at all. This pleasing result is reflected in the percentage utilisation of the maximum residue limits: in nearly 93 percent of the samples where active substances were found, the highest levels only reached 20 percent of the maximum permitted. In addition to the residue-free samples, 26.3 percent contained only one substance and a further 26.8 percent of samples had up to a maximum of three active substances.

Four samples from the EU had to be rejected due to MRLs being exceeded, which resulted in a rejection rate of 2.3 percent. These included two samples from Germany, in one of which the maximum residue levels for the herbicide aclonifen were exceeded by 150 percent and in the other for the fungicide mandipropamid by 128 percent. The two other parsley samples rejected came from Italy. In them, the MRLs for the active substance copper (fungicide) and for chlorpyrifos (insecticide) were exceeded by 119.5 percent and 220 percent respectively. The fungicides difenoconazole, azoxystrobin and dimethomorph were among the active substances most often found.





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Details and backgrounds on the current evaluations

■ In **2.5 percent** of all samples analysed, levels were found that **exceeded the maximum residue levels** (MRLs). Thus, the rejection rate has fallen by 0.6 percentage points compared with the last edition of the Monitoring Report (3.1 percent).

■ The **rejection rate** for produce from **Germany** at **0.8 percent** is at a similarly low level as the previous year (2017 Edition: 0.6 percent). The same is true of the **rejection rate** for produce from **other European countries:** in the current evaluation this is **2.0 percent** and in the year previous it was 1.8 percent. The reason for the slight increase, amongst other things, was an increased rejection rate for kohlrabi leaves (for more information, see the article "Kohlrabi tuber vs. kohlrabi leaves").

■ Italy has **the highest rejection rate of all European sample countries** at **4.1 percent.** However, no specific abnormalities were found here either regarding specific substances used or certain product groups.

■ The **rejection rate** for produce from **non-EU countries** is currently at **5.9 percent,** which is lower than in the previous year (6.7 percent). Within the product group of exotic fruits, which made up 50 percent of samples from non-EU countries, the rejection rate decreased by 2.2 percentage points.

• Madagascan produce samples had a particularly high rejection rate of 14.4 percent. All of the 121 contested samples related to lychee cultures and the active substance sulphur dioxide.

• **53 of 463 samples** from **Turkey** had to be rejected **(exceedance quota: 11.5 percent).** In 25 of the offending samples alone, the MRL for fosetyl-aluminium was exceeded, sweet cherries featured particularly prominently here.

• In **South America, Colombia** and **Brazil** had the highest rejection rate at **9.2** and **6.6 percent** respectively. Abnormalities regarding fosetyl-aluminium were also to be noted in these two countries of origin. Out of 23 offending papaya samples from Brazil, the MRL for fosetyl-aluminium was exceeded in twelve. There is a similar picture in Colombia: out of 10 rejected passion fruit samples, six stood out regarding fosetyl-aluminium alone.

■ **A total of 96 samples** had to be rejected **due to exceedance of the legal residue level for fosetyl-aluminium** (for more information, see infobox).

Fosetyl-aluminium and phosphonic acid

Various sources to be noted

If residues of fosetyl-aluminium are detected in fruit and vegetable samples, these are not exclusively attributable to fosetyl, which is used as a fungicide as part of conventional cultivation. In addition to this active substance, the residue definition also covers its degradation product - phosphonic acid, and its salts - potassium and disodium phosphonate, which, in the meantime, have also been approved as active substances in plant protection products in the EU. Detecting these substances during residue analyses does not automatically mean the active application of fosetyl-aluminium, since phosphonic acid and its salts can also originate from other sources. They are often used as declared or undeclared components of (leaf) fertilizers and in plant strengthening agents. In addition, they can originate from older applications which were still permissible earlier on, since fosetyl is persistent in plants and permanent crops in the wood. So, for example, potassium phosphonate was approved for use in the organic sectors as a plant strengthening agent in many EU countries until 30 September 2013. Especially in the case of permanent crops, such applications can lead to phosphonic acid residues for quite some time. In response, in September 2014, the EU temporarily increased the MRL for selected products until the end of 2015 (EU-regulation 911/2014), i.e. for phosphonic acid and fosetyl-aluminium from 2 to 75 mg/kg. Since 2016, the original maximum residue level of 2 mg/kg again applies to some products. The current MRLs can be found in the EU pesticides database.

Topical and talked about

MRL amendments

Numerous new EU regulations pose growing challenges for the industry

In 2016 alone, the European Union (EU) has issued 22 regulations regarding statutory changes of maximum residue levels (MRLs), which affected 153 different active substances used in plant protection products. This in effect meant that all participants in the supply chain had to deal nearly every fortnight with extensive regulatory changes and the consequences thereof on working practice. This was a trend which has continued almost unchanged in 2017: Here, the EU adopted 15 regulations regarding amendments to MRLs relating to 104 different substances, with 13 of these regulations, the majority in fact, falling in the first half of the year. To give the industry sufficient time for the switch-over and to prevent trade barriers, the EU Commission has granted a transition period of six months for each MRL amendment. The fruit and vegetable industry is facing up to the ever-growing challenges in the interest of preventive consumer protection. Due to the multitude of new EU regulations all participants in the supply chain and in particular QM departments are reaching their limits as part of the implementation process.

Thiabendazole in mangoes

MRL reduction becomes effective after 6-month transition period

On July 21, 2017, the EU published regulation 2017/1164, in which a reduction of the MRL for the substance thiabendazole in mangoes was introduced from 5 to 0.01 mg/kg. According to the regulation, the new MRL becomes effective after a 6-month transition period as of January 21, 2018. Prior to actual publication, a draft of the regulation published at the end of 2016 (SANTE 11077/2016), as well as information from the Federal Ministry of Food and Agriculture (BMEL) from the beginning of 2017 caused a stir by announcing publication of the regulation for the summer of 2017. According to this information the usual transition period of six months after the regulation came into effect was not to apply in the case of mangoes. This would have meant that with the adoption of the regulation, no post-harvest treatment of mangoes intended for marketing in Europe would have been possible with thiabendazole. At least regarding this point the final EU regulation published provided clarity, but nevertheless some questions remain unanswered: only two adequate alternatives to thiabendazole are available on the market in the form of fludioxonil and prochloraz. The European Commission admittedly wants to publish a list with possible alternative fungicides, however, the consequences for all mango imports into the EU cannot be predicted.

Kohlrabi tuber vs. kohlrabi leaves

Different MRLs raise questions

As early as May 2017, the Federal Office of Consumer Protection and Food Safety (BVL) withdrew the use of Pirimor granules/PIRIMAX as a plant protection product for use in greenhouses on kohlrabi. The withdrawal of Calypso for use on kohlrabi outdoors, as well as an order to suspend use of the plant protection product Ortiva followed in June. The background: For residue analyses, kohlrabi leaves and kohlrabi tubers are to be analysed separately. Since regulation 752/2014 came into effect on 1 January 2017, kohlrabi leaves are classified under the crop group kale - having previously been classified as baby leaf salads. Due to the reclassification, in part considerably lower MRLs apply to kohlrabi leaves since the beginning of 2017 than for the kohlrabi tuber. According to research by the BVL, compliance with the MRLs for kohlrabi leaves is no longer guaranteed under the new crop group system following the use of various plant protection products.

Imprint

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