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Έκθεση της EFSA για τα υπολείμματα φυτοφαρμάκων στα τρόφιμα

Σας επισυνάπτουμε για ενημέρωσή σας την Έκθεση της Ευρωπαϊκής Αρχής Ασφάλειας Τροφίμων (EFSA) για τα υπολείμματα φυτοφαρμάκων στα τρόφιμα όπως μας έχει σταλεί από το Γενικό Χημείο του Κράτους, που είναι το Σημείο Επαφής της EFSA στην Κύπρο.

Η Έκθεση βασίστηκε στα δεδομένα των επισήμων ελέγχων των Κρατών Μελών για το 2014 και τα πιο σημαντικά ευρήματα είναι τα εξής:

- Στην συντριπτική πλειοψηφία των αναλυθέντων δειγμάτων (97.1%) είτε δεν ανιχνεύτηκαν υπολείμματα φυτοφαρμάκων είτε τα τελευταία ήταν μέσα στα επίσημα επιτρεπτά όρια.

- Από σχετική εκτίμηση κινδύνου (λόγω χρόνιας έκθεσης) που έγινε, βρέθηκε ότι το ρίσκο για τους καταναλωτές παραμένει χαμηλό.

Για οποιαδήποτε επιπρόσθετη πληροφόρηση, μπορείτε να επικοινωνείτε με τον αρμόδιο λειτουργό του Γενικού Χημείου του Κράτους, κο. Γιώργο Σταυρουλάκη, Εθνικό Σημείο Επαφής της EFSA, τηλ. 22809203, Email: gstavroulakis@sgl.moh.gov.cy

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SCIENTIFIC REPORT

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The 2014 European Union Report on Pesticide Residues in Food

European Food Safety Authority

Abstract

This report provides a detailed insight into the official control activities performed by EU Member States, Iceland and Norway. Overall, 97.1% of the 82,649 samples analysed in 2014 were free of residues or contained residues within the legally permitted levels. Based on the results provided by the reporting countries, detailed analysis were performed regarding pesticide occurrence on the most important food products consumed and the dietary risk related to the exposure of European consumers to pesticide residues. Moreover, the data were analysed with view to identify pesticides and food products that exceeded the legal limits. It also includes the findings on pesticide residues in imported foods, organic products, baby foods as well as results in animal products. Based on analysis of the 2014 pesticide monitoring results, EFSA derived a number of recommendations to further increase the efficiency of the European control systems to ensure a high level of consumer protection.

Keywords: pesticide residues, food control, monitoring, maximum residue levels, consumer risk assessment, Regulation (EC) No 396/2005

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Summary

In the recently published EFSA Strategy 2020, the importance of sharing data related to food safety with the public and with interested parties was acknowledged as one of the key issues enhancing transparency and trust by fostering a culture of openness and cooperation. Structured, high-quality data are also the basis for performing high quality risk assessments ensuring a high level of protection of human health in Europe. This annual report on pesticide residues in food gives a detailed insight into the official control activities of EU Member States, Iceland and Norway and hence is an important element in the implementation of the strategic objectives defined in the EFSA strategy.

This report summarises the results of the 2014 EU-coordinated monitoring programme and the results of the overall control activities (reported as national control programmes).[1] While the national control programmes are mainly risk based, focusing on certain types of products, pesticides or products originating from countries where in the past an increased number of violations was observed, the EU-coordinated programme is aimed at retrieving a representative snapshot of the residue situation of food products available to consumers. Since the two control programmes pursue different purposes, the results are presented separately. In the last part of the report, the results of the dietary risk assessment based on the results derived in the EU-coordinated control programme are presented: the risk assessment is aimed at identifying possible issues of concern with regard to consumer safety related to pesticide residues in food.

Because the results of pesticide residue analysis are available only after most of the products have been already consumed, this report is not a tool for informing the public on imminent risks related to food. However, the comprehensive analysis of the results of all reporting countries provides risk managers with a scientifically sound basis for taking appropriate risk management actions for designing future monitoring programmes efficiently. In particular, this analysis should be used to decide which pesticides and food products should be targeted in risk-based national monitoring programmes or other necessary risk management measures, such as the need to review or modify existing legal limits, to guarantee a high level of consumer protection.

In 2014, the reporting countries analysed in total 82,649 samples for a total of 778 different pesticides. On average, samples were analysed for 212 pesticides. The majority of samples (57,399 samples, 69.4%) originated from EU and EEA countries; 21,219 samples (25.7%) concerned products imported from third countries. For 4,031 samples (4.9%), the origin of the products was not reported.

Overall, 97.1% of the samples analysed under the national control programmes fell within the legal limits; 53.6% of the samples tested were free of quantifiable residues (residues below or at the limit of quantification, LOQ) while 43.4% of the samples analysed contained measurable residues not exceeding the permitted residue concentrations. A total of 2.9% of the samples exceeded the maximum residue levels (MRLs) permitted in the EU legislation (2,421 samples)[2]; taking into account the measurement uncertainty, 1.6% of the samples (1,341 samples) clearly exceeded the legal limits (non-compliance) triggering legal or administrative actions by competent authorities. The results of 2014 are comparable with the previous year (2013: 97.4% of samples within legal limits; 54.6% free of quantifiable residues).

In the framework of the 2014 EU-coordinated programme under Regulation (EC) No 788/2012 and Regulation (EU) No 480/2013, reporting countries were requested to analyse 12 different food products (beans with pods, carrots, cucumbers, mandarins or oranges, pears, potatoes, spinach, rice, wheat flour, liver of ruminants, swine or poultry, poultry muscle/fat). The programme covered a total of 213 pesticides; 191 in foods of plant origin and 58 in foods of animal origin. Overall, 1.5% of the samples exceeded the MRL (192 samples) with 0.8% of the samples being not compliant with the legal limit (104 samples), taking into account the measurement uncertainty. The number of samples

[1] The EU coordinated programme is a subset of samples reported under the national programmes.

[2] Throughout the report, results describing percentage of samples above the legal limit, within the legal limit and samples free of quantifiable residues are provided to one decimal place. Due to the rounding to one decimal place, the added results for these three categories may not total 100% exactly.

[3] Throughout the report, results describing percentage of samples above the legal limit, within the legal limit and samples free of quantifiable residues are provided to one decimal place. Due to the rounding to one decimal place, the added results for these three categories may not total 100% exactly.

with measurable residues but within the legally permitted level was 4,935 (38.4%). In 60.1% of the samples (7,723 samples), no quantifiable residues were found (residues below the LOQ).

The higher MRL exceedance rate of the targeted national control programme (2.9%) compared with the EU-coordinated monitoring programme (1.5%) gives an indication that the targeted sampling strategy implemented by the reporting countries is efficiently identifying products violating EU provisions for pesticide residues in food.

Detailed results of EU coordinated monitoring programme

Among the products covered by the EU-coordinated programme, the highest MRL exceedance rate was found for spinach (3.4% of the samples), followed by beans (with pods) (3.1%), mandarins (2.6%), carrots and rice (both 2.1%), pears (1.6%), oranges and cucumbers (both 1.5%). For processed wheat (wheat flour), the measured residue concentrations were reported to exceed the legal limit in 0.4% of the samples analysed while for liver and poultry muscle/fat no MRL exceedances were identified.

Samples containing more than one pesticide in individual samples (multiple residues) were found in all food products analysed in the framework of the EU-coordinated programme. The products with the highest percentage of samples with multiple residues were mandarins (64.7%), oranges (60.5%), pears (57.6%) and cucumbers (26.6%). Lower occurrence levels were recorded for beans (with pods) (19.2%), spinach (18.4%), carrots (16.2%), wheat flour (11.8%), rice (9.2%) and potatoes (7.5%). The presence of multiple pesticide residues was low in animal products (0.9% for poultry muscle/fat and 0.1% for liver (different species)).

All food products of the 2014 EU-coordinated programme were also analysed in 2011. Overall, the MRL exceedance rate in 2014 was in the same range as in 2011 (1.6% in 2011, 1.5% in 2014) although in 2014 the number of pesticides to be analysed has been substantially extended (40 additional pesticides had to be analysed in the samples). Considering the individual food products separately, a slight decline of the MRL exceedance rate was noted for spinach, beans with pods, cucumbers and oranges, while for mandarins, carrots, pears and potatoes a slight increase of the percentage of samples with residue above the legal limit was noted.

Detailed results of national control programmes

A detailed analysis of the national control programmes revealed the different scopes of the national MRL enforcement strategies, in particular as regards the types and origin of products to be tested, the pesticides analysed and the number of samples taken. Overall, they provide an impressive amount of information on the pesticide residues in food placed on the European market. The exceptional efforts of Member States to improve the quality and the amount of data on pesticide residues in food are acknowledged.

Among the samples from third countries, the legal limit was exceeded in 6.5% of the samples; for 3.9% of the samples, administrative or legal sanctions were imposed as they clearly exceeded the legal limit taking into account the measurement uncertainty. It is noted that a substantial amount of the imported products were taken in the framework of enhanced import controls under Regulation (EC) No 669/2009 (i.e. 6,513 samples of the 25,250 samples originating from third countries). Products from the EU and EEA countries were found to have a lower exceedance and non-compliance rate (1.6% of the samples contained residues that exceeded the permitted concentrations; 0.8% of the samples clearly exceeded the legal limit triggering enforcement actions). Compared with 2013, the MRL exceedance rate for imported food products slightly increased (2013: 5.7%); for EU/EEA products the situation was found to be stable (2013: 1.5%). While 56.6% of the EU/EEA samples analysed in 2014 were free of quantifiable residues, the result was lower for samples from third countries (45.5%).

In unprocessed products, MRL exceedances were detected in 3.1% of the samples; 45.7% of the samples contained residues but within the legal limits and 51.2% of the unprocessed products were free of quantifiable residues. Processed products in general had a lower prevalence of pesticide residues and MRL exceedances (31.7% of all processed products contained quantifiable residues within the legal limit, 1.1% MRL exceedance rate).

Residues of more than one pesticide (multiple residues) were found in 28.3% of the samples (23,420 samples), a slight increase compared to 2013 (27.3%).

Among the 3,265 individual determinations that exceeded the legal limit, 1,253 determinations were reported for pesticides that are currently not approved in the EU. In most cases, these MRL exceedances for non-approved pesticides were related to imported products (957 cases) while, for products produced in EU and EEA countries, MRL exceedances with non-approved pesticides occurred less frequently (245 results).

In total, 6,513 samples of products covered by Regulation (EC) No 669/2009 (increased level of official controls on imported food and feed of non-animal origin) were analysed. In this subset of samples that is targeted at products with a previously observed high non-compliance rate, 406 samples (6.2%) exceeded the legal limit for one or several pesticides; 237 samples (3.6%) were considered non-compliant taking into account the measurement uncertainty.

A total of 1,812 samples of baby foods were analysed. In 91.8% of the samples, no quantifiable residues were found (residues below the LOQ), whereas 148 samples (8.2%) contained quantifiable residues at or above the LOQ. For 135 samples (7.5% of the analysed baby food samples), the residue concentration exceeded the default MRL of 0.01 mg/kg applicable for baby foods. The majority of these samples was related to residues of copper compounds, fosetyl-Al, didecyldimethylammonium chloride (DDAC) and benzalkonium chloride (BAC). According to the evaluation of reporting countries, only 36 samples (2.0%) were considered as exceeding the legal limit; 34 samples were non-compliant, taking into account the measurement uncertainty.

In 12.4% of samples of organic products (595 of the 4,792 samples analysed), pesticide residues were detected, but within the legal limits; however, 220 of these samples contained residues of substances that are not necessarily resulting from the use of pesticides (e.g. naturally occurring substances, persistent environmental pollutants) and substances that are explicitly allowed in organic farming. In 1.2% of the samples (57 samples), the MRL was exceeded.

The majority of samples of animal products (9,152 samples) was free of measurable residues (84.7%, 7,751 samples). The most frequently detected pesticides were persistent environmental pollutants, or compounds resulting from sources other than pesticide use.

Results of dietary risk assessment

Considering the frequency of pesticide residues detected in food commonly consumed, a wide range of European consumers is expected to be exposed to these substances via food. EFSA performed a short-term and long-term dietary risk assessment for the pesticides covered by the EU-coordinated programme (EUCP) in order to get an estimate of the expected exposure and to identify possible related risk. The methodology used is a screening method which is likely to overestimate the real exposure as it is based on conservative model assumptions.

The short-term (acute) exposure was calculated for the 12 food products covered by the 2014 EUCP (i.e. beans with pods, carrots, cucumbers, mandarins or oranges, pears, potatoes, spinach, rice, wheat flour, liver of ruminants, swine or poultry, poultry meat). For the majority of the samples analysed in 2014, the short-term exposure was found to be negligible or within a range that is unlikely to pose a consumer health concern. For 346 samples of the total of 18,332 samples taken into account for the short-term dietary exposure assessment, the estimated exposure exceeded the toxicological reference value (ARfD), giving an indication of possible negative health effects. These results refer to 27 different pesticides. The calculations were based on conservative assumptions (i.e. consumption of these food products in high amounts without washing or any processing that would reduce the residues (e.g. cooking); in addition, it was assumed that the residue concentration in the consumed products was five to seven times higher than the residues measured in the samples analysed[3]). Given this conservatism of the risk assessment methodology, real exposure was expected to be significantly lower. Based on these results, EFSA concluded that the probability of European citizens being exposed to pesticide residues exceeding concentrations that may lead to negative health outcomes was low but for a limited number of samples a possible short-term consumer health risk could not be completely ruled out.

[3] A so-called unit variability factor of 5 or 7 is used in the current risk assessment methodology for short-term dietary exposure, assuming a non-homogeneous distribution among the individual units. The variability factors are applied for mid-sized products like carrots, cucumbers, mandarins, oranges, pears, potatoes; for products that are normally mixed or bulked before consumption, no variability factor is applied for the acute risk assessment.

EFSA also calculated the chronic or long-term exposure, predicting lifetime exposure of the pertinent pesticide. For all pesticides of the EU-coordinated monitoring programme, the long-term exposure was negligible or within the toxicologically acceptable levels (i.e. below the ADI). Thus, residues of these pesticides, according to current scientific knowledge, are not likely to pose a long-term consumer health risk.

EFSA derived a number of recommendations aiming to further increase the efficiency of the EU-coordinated and national programmes.

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1. Background

1.1. Legal Basis

Pesticide residues resulting from the use of plant protection products on crops or food products that are used for food or feed production may pose a risk factor for public health. For this reason, a comprehensive legislative framework has been established in the European Union (EU), which defines rules for the approval of active substances used in plant protection products, the use of plant protection products and for pesticide residues in food. In order to ensure a high level of consumer protection, legal limits, so called 'maximum residue levels' or briefly 'MRLs', are established in Regulation (EC) No 396/2005. EU-harmonised MRLs are set for more than 500 pesticides in over 370 food products/food groups. A default MRL of 0.01 mg/kg, a level equal to the limit of quantification (LOQ) achievable with analytical methods used for MRL enforcement, is applicable for pesticides not explicitly mentioned in the MRL legislation. Regulation (EC) No 396/2005 imposes on Member States the obligation to carry out controls to ensure that food placed on the market is compliant with the legal limits. This Regulation establishes both EU and national control programmes:

- EU-coordinated control programme: this programme defines the food products and pesticides that should be monitored by all Member States. The EU-coordinated programme (EUCP) relevant for the calendar year 2014 was set up in Commission Implementing Regulation (EU) No 788/2012,[4] amended by Commission Implementing Regulation (EU) No 480/2013[5], and Commission Regulation (EU) No 481/2013[6] hereafter referred to as '2014 monitoring regulation'.
- National control programmes: Member States usually define the scope of national control programmes focussing on certain products, which are expected to contain residues in concentrations exceeding the legal limits, or on products that are more likely to pose risks for consumer safety (Article 30 of Regulation (EC) No 396/2005).

According to Article 31 of Regulation (EC) No 396/2005, Member States are requested to share the results of the official controls and other relevant information with the European Commission, EFSA and other Member States. EFSA is in charge of preparing an Annual Report on pesticide residues, analysing the data in view of the MRL compliance of food available in the EU and the exposure of European consumers to pesticide residues. In addition, based on the findings, EFSA should derive recommendations for future monitoring programmes.

Specific MRLs are set in Directives 2006/125/EC[7] and 2006/141/EC[8] for food intended for infants and young children. In general, a default MRL of 0.01 mg/kg is applicable for such food unless lower legal limits for the residue levels are defined in the Directives. Regulation (EC) No 609/2013[9] repeals the aforementioned Directives; however, the pesticide MRLs of Directive 2006/125/EC and 2006/141/EC were still applicable in 2014. In the framework of the 2014 EUCP, Member States had to take at least 10 samples of infant formulae and follow-on formulae.

It is noted that some of the active substances for which legal limits are set under Regulation (EC) No 396/2005 are also covered by Commission Regulation (EU) No 37/2010 on pharmacologically active substances[10]. For these so-called dual use substances, Member States have the obligation to perform

4 Commission Implementing Regulation (EU) No 788/2012 of 31 August 2012 concerning a coordinated multiannual control programme of the Union for 2013, 2014 and 2015 to ensure compliance with maximum residue levels of pesticides and to assess the consumer exposure to pesticide residues in and on food of plant and animal origin. OJ L 235, 1.9.2012, p. 8–27.

5 Commission Implementing Regulation (EU) No 480/2013 of 24 May 2013 amending Implementing Regulation (EU) No 788/2012 as regards the period of analysis of certain pesticides performed on a voluntary basis. OJ L 139, 25.5.2013, p. 4.

6 Commission Regulation (EU) No 481/2013 of 24 May 2013 adapting Implementing Regulation (EU) No 788/2012 as regards the number of samples to be taken and analysed by Croatia for the pesticide/product combinations

7 Commission Directive 2006/125/EC of 5 December 2006 on processed cereal-based foods and baby foods for infants and young children. OJ L 339, 6.12.2006, p. 16–35.

8 Commission Directive 2006/141/EC of 22 December 2006 on infant formulae and follow-on formulae and amending Directive 1999/21/EC. OJ L 401, 30.12.2006, p. 1–33.

9 Regulation (EU) No 609/2013 of the European Parliament and of the Council of 12 June 2013 on food intended for infants and young children, food for special medical purposes, and total diet replacement for weight control and repealing Council Directive 92/52/EEC, Commission Directives 96/8/EC, 1999/21/EC, 2006/125/EC and 2006/141/EC, Directive 2009/39/EC of the European Parliament and of the Council and Commission Regulations (EC) No 41/2009 and (EC) No 953/2009. OJ L181, 29.6.2013, p. 35–56.

10 Commission Regulation (EU) No 37/2010 of 22 December 2009 on pharmacologically active substances and their classification regarding maximum residue limits in foodstuffs of animal origin. OJ L 015 20.1.2010, p. 1

controls in accordance with Council Directive 96/23/EC[11] for veterinary medicinal products; the results of the controls for dual use substances[12] are also reported in the framework of this report.

It should be highlighted that for organic products no specific MRLs are established. Thus, the MRLs set in Regulation (EC) No 396/2005 apply equally to organic food and to conventional food. Regulation (EC) No 889/2008[13] on organic production of agricultural products defines specific labelling provisions and production methods, which entail significant restrictions on the use of pesticides.

Regulation (EC) No 669/2009[14] lays down rules concerning the increased level of official controls to be carried out on a list of food and feed of non-animal origin which, based on known or emerging risks, requires an increased level of controls prior to their introduction into the EU. The food products, the country of origin of the products, the frequency of checks to be performed at the point of entry into the EU territories and the hazards (e.g. certain pesticides, not approved food additives, mycotoxins) are specified in Annex I to this Regulation which is regularly updated; for the calendar year 2014, four updated versions were relevant.[15,16,17,18]

Other horizontal legislation relevant for food control and pesticides, which have some relevance for the current report, are outlined in the 2011 European Union Report on Pesticide Residues in Food (EFSA, 2014b).

1.2. Terms of Reference

In accordance with Article 32 of Regulation (EC) No 396/2005, EFSA shall prepare an Annual Report on pesticide residues concerning the official control activities for food and feed carried out in 2014.

The Annual Report shall include at least the following information:

- an analysis of the results of the controls on pesticide residues provided by EU Member States;
- a statement of the possible reasons why the MRLs were exceeded, together with any appropriate observations regarding risk management options;
- an analysis of chronic and acute risks to the health of consumers from pesticide residues;
- an assessment of consumer exposure to pesticide residues based on the information provided by Member States and any other relevant information available, including reports submitted under Directive 96/23/EC.[19]

In addition, the report may include an opinion on the pesticides that should be included in future programmes.

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[11] Council Directive 96/23/EC of 29 April 1996 on measures to monitor certain substances and residues thereof in live animals and animal products and repealing Directives 85/358/EEC and 86/469/EEC and Decisions 89/187/EEC and 91/664/EEC. OJ L 125, 23.5.1996, p. 10.

[12] The comprehensive results from the monitoring of veterinary medicinal product residues and other substances in live animals and animal products are published in a separate report (EFSA, 2016e)

[13] Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control. OJ L 250, 18.9.2008, p. 1–84.

[14] Commission Regulation (EC) No 669/2009 of 24 July 2009 implementing Regulation (EC) No 882/2004 of the European Parliament and of the Council as regards the increased level of official controls on imports of certain feed and food of non-animal origin and amending Decision 2006/504/EC. OJ L 194, 25.7.2009, p. 11–21.

[15] Commission Implementing Regulation (EU) No 1355/2013 of 17 December 2013 amending Annex I to Regulation (EC) No 669/2009 implementing Regulation (EC) No 882/2004 of the European Parliament and of the Council as regards the increased level of official controls on imports of certain feed and food of non-animal origin. OJ L 341, 18.12.2013, p. 35–42.

[16] Commission Implementing Regulation (EU) No 323/2014 of 28 March 2014 amending Annex I to Regulation (EC) No 669/2009 implementing Regulation (EC) No 882/2004 of the European Parliament and of the Council as regards the increased level of official controls on imports of certain feed and food of non-animal origin. OJ L 95, 29.3.2014, p. 12–23.

[17] Commission Implementing Regulation (EU) No 718/2014 of 27 June 2014 amending Annex I to Regulation (EC) No 669/2009 implementing Regulation (EC) No 882/2004 of the European Parliament and of the Council as regards the increased level of official controls on imports of certain feed and food of non-animal origin. OJ L 190, 28.6.2014, p. 55–62.

[18] Commission Implementing Regulation (EU) No 1121/2014 of 26 September 2014 amending Annex I to Regulation (EC) No 669/2009 implementing Regulation (EC) No 882/2004 of the European Parliament and of the Council as regards the increased level of official controls on imports of certain feed and food of non-animal origin. OJ L 283, 27.9.2014, p. 32–39.

[19] Council Directive 96/23/EC of 29 April 1996 on measures to monitor certain substances and residues thereof in live animals and animal products and repealing Directives 85/358/EEC and 86/469/EEC and Decisions 89/187/EEC and 91/664/EEC. OJ L 125, 23.5.1996, p. 10–32.

2. Introduction

This report provides an overview of the official control activities performed by EU Member States and European Free Trade Association (EFTA) countries in order to ensure compliance of food with the legal limits. It should be noted that for the first time Croatia provided data in the framework of the EU monitoring programme for the reference period 2014.

The results for pesticide residues in food provided by the reporting countries were analysed to identify key characteristics for different pesticides, food products or product groups. In addition, the data were analysed to identify trends compared with the results of previous monitoring programmes. The types of data analyses presented in the 2014 report are similar to the analyses of previous years to allow comparison of different years. However, taking into account questions and suggestions from stakeholders, EFSA included additional analyses to address these issues (e.g. more details on organic products or on baby food,[20] results for glyphosate, more comparisons with results of the previous years). Although cumulative risk assessment was one point that was repeatedly requested to be taken on board in the EFSA annual reports on pesticide residues, this issue could not be considered in this report because the grouping of pesticides in cumulative assessment groups and the methodology to estimate the cumulative exposure is not yet finalised (EFSA, 2016a). Information on the progress in the project that is of high priority for EFSA and invitation to provide input or comments at different steps of the implementation of cumulative exposure assessment can be found on the EFSA website.

Following frequently asked questions on the interpretation of the results presented in the previous report, EFSA would like to clarify that the results provided by Member States are presented in the following categories:

- Samples without measurable or quantifiable residues: the terms are used as synonyms to describe results where the analytes were not present in concentrations exceeding the limit of quantification (LOQ). The LOQ is the smallest concentration of an analyte that can be quantified. It is commonly defined as the minimum concentration of the analyte in the test sample that can be determined with acceptable precision and accuracy.
- Samples with measurable/quantifiable residues but within the legal limits (below or at the MRL): these samples contained residues of one or several pesticides in concentrations that are legally permitted.
- Samples with residues exceeding the legal limit (residues above the MRL): In general, this term is used to describe samples where one or several pesticides were found in concentrations that numerically exceed the legal limit.
- Non-compliant samples: samples containing residue concentrations clearly exceeding the legal limits, taking into account the measurement uncertainty. The concept of measurement uncertainties and the impact on the decision of non-compliance is described in Figure 1 of the guidance document on reporting data on pesticide residues (EFSA, 2015e). It is current practice that the uncertainty of the analytical measurement is taken into account before legal or administrative sanctions are imposed on food business operators for infringement of the MRL legislation.

It is noted that a separate analysis of samples with residues below the limit of detection (LOD),[21] thus, samples free of any detectable residues, could not be performed, since this information is not reported consistently by the reporting countries, although in a previous report (EFSA, 2014d), it was recommended to provide this piece of information. Further discussions with reporting countries on the feasibility to implement this recommendation are ongoing.

In accordance with the principle of engaging stakeholders in the process of scientific assessment defined in the EFSA strategy 2020, interested readers are encouraged to submit further suggestions on the type of data that should be presented in more detail in future reports (pesticides.mrl@efsa.europa.eu).

[20] In the framework of this report, the term 'baby food' refers to the products covered by the provisions of Directive 2006/125/EC and 2006/141/EC, i.e. infant formulae, follow-on formulae, processed cereal-based foods for infants and young children and baby foods other than processed cereal-based foods.

[21] The LOD is the lowest concentration of a pesticide residue that can be identified in a sample with an acceptable degree of certainty. However, the amount of the analyte can not be quantified reliably.

The results of the national monitoring programmes had to be reported using the Standard Sample Description, a data-reporting format developed by EFSA.[22] For the 2014 data collection, EFSA put a major emphasis on improving the quality of the data: for this purpose a completely revised guidance document on the coding of samples was elaborated to ensure that the data provided from different data providers are coded consistently (EFSA, 2015e). In addition, the data validation was further elaborated. These steps were considered necessary with view to the future presentation of the results in the data warehouse in line with the Open Data approach defined in the EFSA strategy 2020. Well-structured data are also indispensable for performing high quality risk assessments.

In each EU Member State and EFTA country, two control programmes are in place: an EU-coordinated control programme (EUCP) and a national control programme (NP). The results of the 2014 EU-coordinated programme, as defined in Commission Implementing Regulation (EC) No 788/2012 and Commission Implementing Regulation (EU) No 480/2013 are summarised in Section 3 of this report. The purpose of this programme is to generate indicator data that are statistically representative of the MRL exceedance rate for food of plant and animal origin placed on the European common market, and which can be used to estimate the actual long-term consumer exposure of the European population.

In contrast to the EUCP, the national control programmes are mainly risk based and are complementary to the random, non-targeted controls performed in the context of the EU-coordinated programme; the design and results of the national control programmes are reported in Section 4. The results of samples taken in the framework of import control required under Regulation (EC) No 669/2009, as well as results for baby foods and for organic products, are also reported in this Section 4.

The results of the dietary exposure assessments for individual pesticides are described in Section 5. This section is intended to identify risks for consumers related to pesticide residues in food.

Additional information and more detailed results related to the 2014 monitoring activities can be found on the EFSA website and on the websites of the national competent authorities (Appendix A). In addition, EFSA compiled a technical report (EFSA, 2016f) containing the national summary reports submitted by the reporting countries, where further details on the pesticide monitoring activities at national level are provided.

Together with this report, EFSA has published an Excel file supplement where detailed results for the determinations/samples exceeding the legal limit can be found.

3. EU-coordinated control programme

3.1. Design of the EU-coordinated control programme

According to the 2014 monitoring regulation (Commission Implementing Regulation (EU) No 788/2012 and Commission Implementing Regulation (EU) No 480/2013), reporting countries were requested to analyse in total 12 different food products (beans with pods, carrots, cucumbers, mandarins or oranges, pears, potatoes, spinach, rice, wheat flour, liver of ruminants, swine or poultry, poultry meat[23]). The number of samples per food product to be analysed by each reporting country varied from 15 to 93, depending on the population of the reporting country.

This regulation defined a total of 213 pesticides to be analysed; 191 thereof in food of plant origin and 58 in food of animal origin. The list of pesticides covered by the 2014 EUCP, including further details on the pesticides that had to be analysed on food of plant or animal origin, is presented in Appendix B, Table 17.

[22] The description of the data model and explanations on the coding to be used for the different parameters can be found in a guidance document prepared by EFSA (EFSA, 2015e).

[23] On 1 April 2013, with entry into force of Commission Regulation (EU) No 212/2013 of 11 March 2013 replacing Annex I to Regulation (EC) No 396/2005 of the European Parliament and of the Council as regards additions and modifications with respect to the products covered by that Annex, OJ L 68, 12.3.2013, the description of the product to which the MRL applies has changed. At the time when the monitoring regulation relevant for the calendar year 2014 was adopted, the product description was poultry meat (whole product or the fat fraction only) whereas in 2014 the product was defined as muscle (meat after removal of trimmable fat).

In 2011, basically the same food products were analysed as in 2014.[24] The pesticide list of the 2014 EUCP was overlapping with the 2011 programme largely; only quintozene, tecnazene (relevant in 2011 for animal products) and dinocap (relevant for plant products) were no longer requested to be analysed in 2014. Compared with 2011, 40 new pesticides were part of the 2014 programme, i.e. 2-phenylphenol, biphenyl, chlorantraniliprole, cymoxanil, cyromazine, dichlorprop (RD), diethofencarb, diflubenzuron, diniconazole-M, dithianon, dodine, ethoprophos, famoxadone, fenamidone, fenpropidin (RD), fenpyroximate, flonicamid, flubendiamide, fluopyram, formothion, glufosinate (RD), ioxynil (RD), isocarbophos, isofenphos-methyl, isoprocarb, maleic hydrazide (RD), mandipropamid, meptyldinocap (RD), metaflumizone, metconazole, metobromuron, propoxur, pymetrozine, pyraclostrobin, rotenone, spirodiclofen, spiromesifen, terbuthylazine, tetramethrin and topramezone. For the overlapping pesticides and food products, EFSA performed a comparative assessment of results reported in 2014 and 2011.

Member States had to take at least one sample from organic production for each of the 12 food products in focus. For the 733 organic samples reported under the 2014 EUCP, EFSA did not perform a separate analysis of the results in this section of the report, but pooled the results with the results of organic samples reported in the framework of national control plans. Readers interested in comparative results for conventional and organic products are referred to Section 4.2.6.

In addition to the food products mentioned above, each reporting country had to take at least 10 samples of infant formulae and follow-on formulae. A comprehensive analysis of the results of the 218 infant formulae and follow-on formulae reported under the EUCP are reported in Section 4.2.5 alongside the results for other baby food products.

In total, 12,850 samples were analysed in the framework of the 2014 EUCP by the 30 reporting countries. The breakdown of the number of samples taken by each country is reported in Figure 1.

[24] In 2014, poultry meat was no longer included in the food classification relevant for pesticide MRLs; it was replaced by poultry muscle.

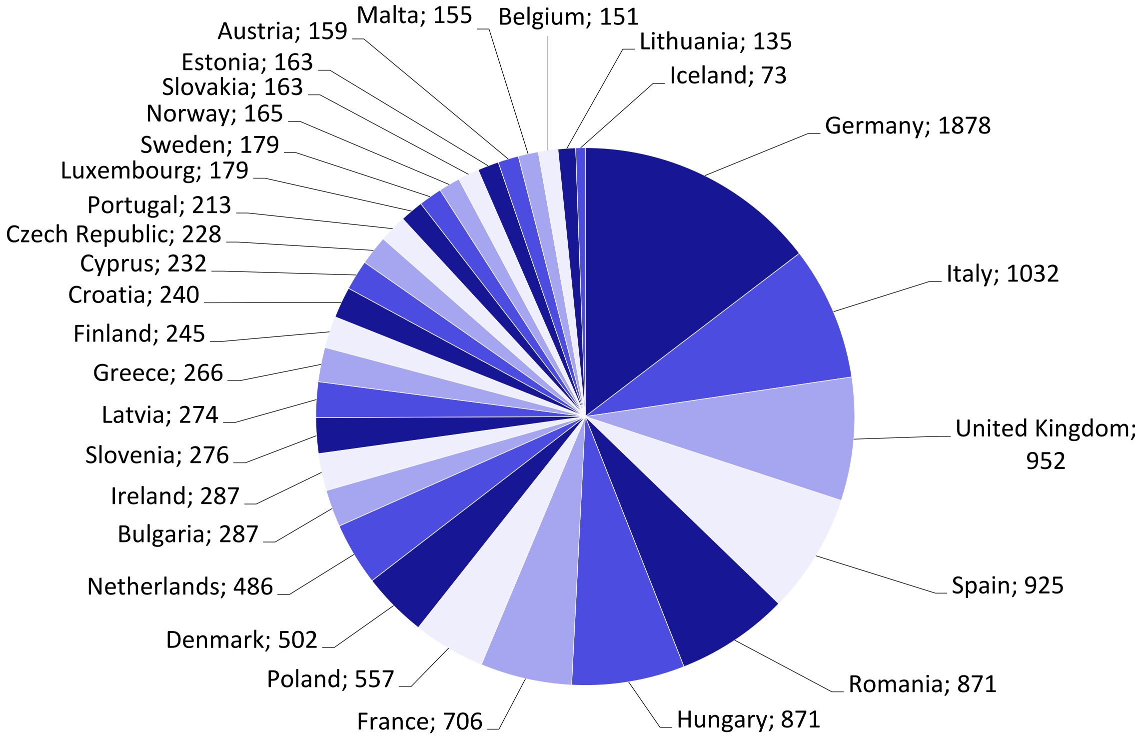


Figure 1: Number of samples taken by reporting country under the EUCP (excluding samples of infant formulae and follow-on formulae)

3.2. Results by pesticide

Among the 191 pesticides to be analysed in plant products, the following 37 have not been detected in any of the samples analysed (the number in brackets refer to the total number of samples analysed for the pertinent pesticide): bromopropylate (9518), phosalone (9426), ethion (9245), fenitrothion (9082), tetradifon (9010), mepanipyrim (RD) (8917), dichlorvos (8773), bitertanol (8722), parathion (8454), fenbuconazole (8440), dichlofluanid (8437), EPN (8277), isofenphos-methyl (8212), carbofuran (RD) (8019), diniconazole (7910), aldicarb (RD) (7750), propoxur (7722), dicrotophos (7376), fenamiphos (RD) (7335), methoxychlor (7319), tolylfluanid (RD) (7249), metconazole (7208), trichlorfon (7184), parathion-methyl (RD) (7145), nitenpyram (6827), famoxadone (6742), oxydemeton-methyl (RD) (6559), metobromuron (6503), isocarbophos (6423), isoprocarb (6022), formothion (5711), rotenone (5651), carbosulfan (5580), vinclozolin (RD) (4746), benfuracarb (4492), meptyldinocap (RD) (1036) and amitrole (392).

In plant products, 154 different substances were found in measurable concentrations. Residues exceeding the legal limits were related to 69 different pesticides. Pesticides which were detected in at least 1% of the samples of plant products, or for which an exceedance was identified in at least 0.02% of the samples analysed, are presented in Figure 2. The pesticides are ordered alphabetically; the figures in brackets next to the name of the pesticide refer to the number of samples without detectable residues (residues below the LOQ), the number of samples with residues within the legally permitted concentrations and the number of samples exceeding the MRLs, respectively. Among the pesticides that had to be analysed in all plant products, the most frequently detected pesticides present in more than 4% of the samples analysed were imazalil, boscalid, dithiocarbamates, chlorpyrifos, chlormequat, propamocarb, bromide ion, thiabendazole, pyrimethanil and cyprodinil. Further details on the pesticides analysed under the EU-coordinated monitoring programme are reported in Appendix B (Table 17) and Section 3.3.

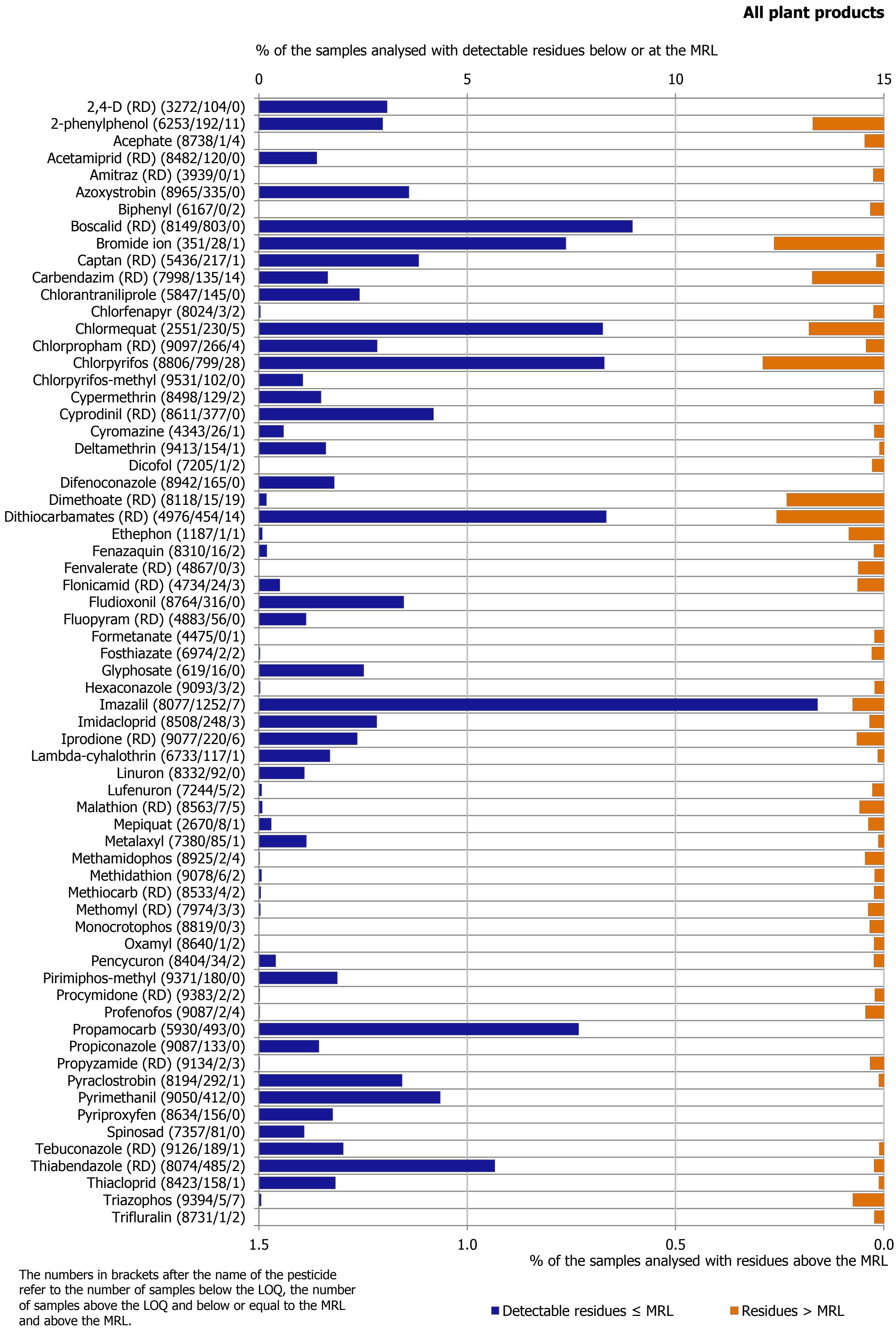


Figure 2: Pesticides detected in plant products (detection rate > 1% and/or MRL exceedance rate > 0.02%), sorted alphabetically

Regarding animal products, the following 46 of the 58 pesticides covered by the EUCP were not detected in any of the samples analysed (ordered by the total number of samples analysed): deltamethrin (2242), endrin (2189), permethrin (2159), bifenthrin (2146), methoxychlor (2105), diazinon (2098), chlorpyrifos (2091), chlorpyrifos-methyl (2083), parathion (2073), cypermethrin (2060), dieldrin (RD) (1992), methidathion (1989), pyrazophos (1968), triazophos (1955), azinphos-ethyl (1900), profenofos (1884), parathion-methyl (RD) (1728), heptachlor (RD) (1671), fenthion (RD) (1603), cyfluthrin (1596), fenvalerate (RD) (1567), tetraconazole (1347), fluquinconazole (1129), prochloraz (RD) (712), tebuconazole (RD) (691), cyproconazole (641), epoxiconazole (629), famoxadone (589), thiacloprid (536), metazachlor (487), spinosad (398), carbendazim (RD) (384), metaflumizone (350), flusilazole (RD) (344), ioxynil (RD) (284), dichlorprop (RD) (265), spiroxamine (RD) (189), fenpropimorph (RD) (145), haloxyfop-R (RD) (131), fluopyram (RD) (119), fenpropidin (RD) (100), prothioconazole (RD) (97), chlormequat (57), topramezone (46), maleic hydrazide (RD) (46) and mepiquat (31).

The remaining pesticides were detected sporadically, DDT being the most frequently detected compound (1.3% of the samples of animal origin analysed in the framework of the EUCP); the other pesticides (mainly non-approved pesticides present in the food chain due to their persistence, such as hexachlorobenzene, chlordane, lindane, alpha- and beta-HCH and endosulfan) were detected in less than 0.75% of the samples, respectively.

3.3. Results by food products

In this section, detailed results concerning the 12 food products covered by the 2014 EUCP are reported. For each food product, the following analyses are presented:

- Key figures to describe the results for the matrices analysed, such as the number of samples analysed, the percentage of samples free of quantifiable residues (samples with residues below the LOQ), percentage of samples with multiple residues, the number of samples exceeding the legal limit and number of samples found to be non-compliant; the percentages of samples free of detectable residues (residues below or at the LOQ) and of samples with single and multiple residues (residues > LOQ)[25] are presented in a pie chart;
- Key characteristics regarding the pesticides detected (e.g. number of pesticides detected, the most frequently found pesticides and the number of pesticides in exceedance of a MRL);
- In a bar chart presenting the pesticides found are presented, sorted according to the frequency of detection in 2014. The percentages of samples with residues above the LOQ but below or equal to the MRL are included on the left part of the chart (blue bars; upper x-axis scale). In the same chart, the percentages of samples with residues exceeding the MRLs are included on the right part of the chart (orange bars; lower x-axis scale). The figures in brackets next to the name of the pesticide refer to the number of samples without quantifiable residues (samples with residues below the LOQ), the number of samples with residues within the legally permitted concentrations and the number of samples exceeding the MRLs, respectively. For the preparation of the bar charts, the result evaluations of the reporting countries were used. Thus, it reflects the conclusions of reporting countries whether the result was found to be within the legal limit or exceeded the legal limit.[26] The light bars refer to the results of 2011, while the bars in the darker shade refer to the results of 2014. A maximum of 45 pesticides are plotted for each food product. The pesticides with no detections in 2014 but where MRL exceedances were observed in 2011, are plotted at the bottom of the bar chart. Pesticides in the scope of the 2014 monitoring programme and not in the 2011 programme are marked with an asterisk.
- A figure presenting the distribution of the measured residue levels, expressed as a percentage of the MRL applicable for the specific pesticide/crop combination. The figures in brackets next to the name of the pesticide refer to the number of samples without measurable residues, the number of samples with residues within the legally permitted concentrations and the number of samples exceeding the MRLs, respectively. Each result above the LOQ is depicted as a dot in the respective

[25] Due to the rounding of the results, the total percentage may slightly differ from 100%.

[26] For deciding whether a residue exceeded the legal limit, the measurement uncertainty was not taken into account. Thus, in this presentation samples exceeding the legal limit numerically, but which would not trigger any legal or administrative follow-up actions are presented in the category "residues above the MRL".

figure. Results above 300% of the MRL are mentioned on the right side of the chart. Pesticides that were not analysed in the specific crop or where no detectable results were found are not reflected in this presentation. For pesticides/commodity combinations where the legal limit changed during 2014, the MRL in place at the beginning of the calendar year was used as reference value.

- Further information on the pesticides most frequently found in the concerned food products (pesticides found in at least 5% of the samples, unless stated differently).

In a separate Excel file published as a supplement to this report, the full list of samples exceeding the MRLs can be found, including information on the measured residue concentrations and the origin of the samples.

3.3.1. Beans with pods

In 2014, 999 samples of beans with pods were analysed; in 569 samples (57%), no pesticide residues were detected, while 430 samples (43%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 192 samples (19.2%); up to seven different pesticides were detected in an individual beans with pod sample (Figure 3). Compared to 2011, the overall detection rate decreased slightly (2011: 46% of the samples contained pesticide residues).

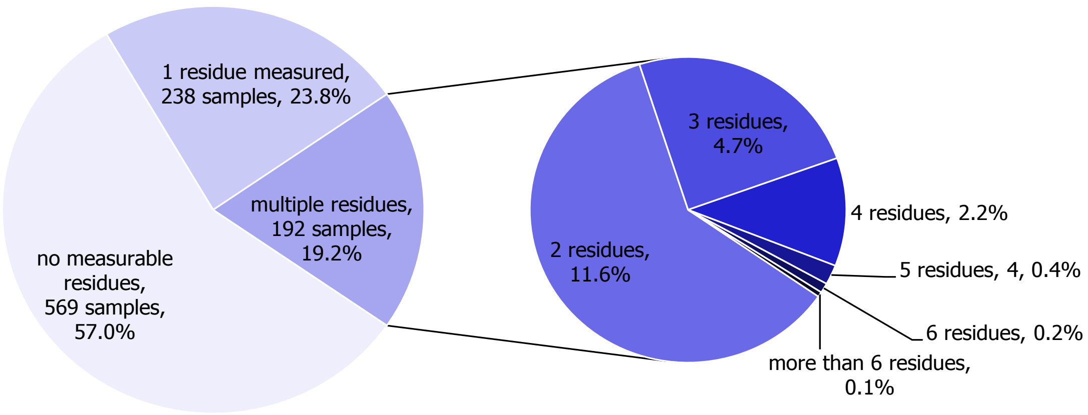


Figure 3: Number of detectable residues in individual beans with pod samples

In 3.1% of the samples (31 samples), the residue concentrations exceeded the MRLs; 2.1% of the samples (21 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were mainly related to imported products (23 samples).

In total, 77 different pesticides were found in concentrations greater than the LOQ. The most frequently found pesticides were iprodione (RD) (detected in 10.1% of the tested samples), boscalid (RD) (9.7%) and azoxystrobin (9.0%). The MRL was exceeded for 20 different pesticides, most frequently for dimethoate (RD) (3 samples from India, 2 samples from Kenya and 1 sample from Morocco and Egypt) and methomyl (RD) (2 samples from Kenya and 1 sample from the Dominican Republic).

Figure 4 depicts the results for all pesticides with MRL exceedances and the most frequently detected pesticides. Compared to 2011, the detection rate was in the same range for most pesticides; for azoxystrobin, carbendazim, lambda-cyhalothrin and a number of other pesticides an increased detection rate was observed. An increased number of MRL exceedances was noted for some pesticides, mainly insecticides/acaricides (e.g. dimethoate (RD), lambda-cyhalothrin, acephate, monocrotophos, profenofos, triazophos). It should be also highlighted that no MRL exceedances were reported in 2014 for pesticides that were found to exceed the legal limit in 2011 (e.g. cypermethrin, spinosad, thiophanate-methyl, propamocarb, acetamiprid (RD), pyraclostrobin, tau-fluvalinate, oxamyl, fipronil (RD) and propargite). The individual residue concentrations, expressed as a percentage of the respective MRL are plotted in Figure 5. Further information on the most frequently detected pesticides found in beans with pods in 2014 in at least 5% of the samples is compiled in Table 1.

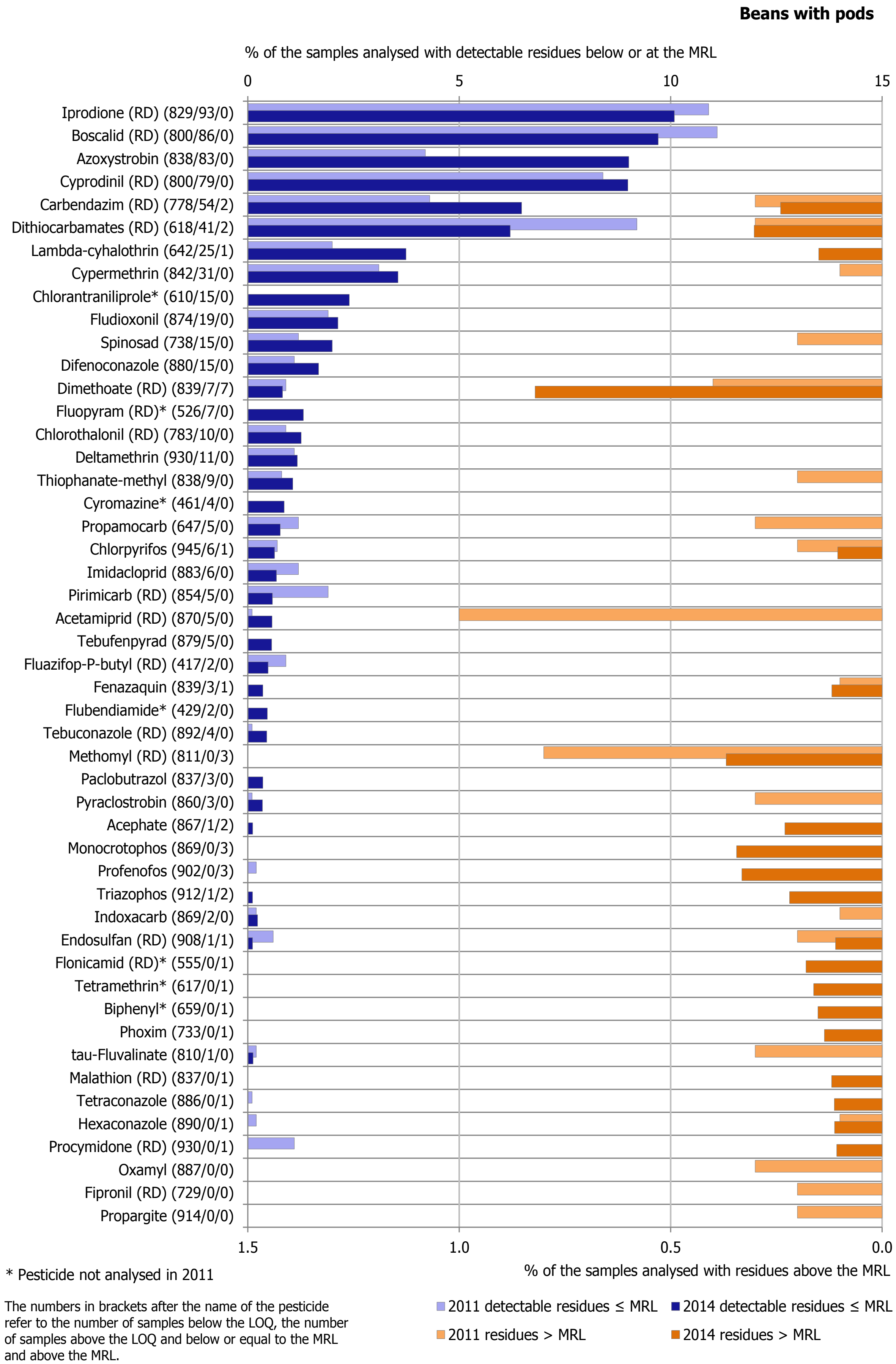


Figure 4: Percentage of beans with pod samples with detectable residues below or equal to the MRL and with residues above the MRL

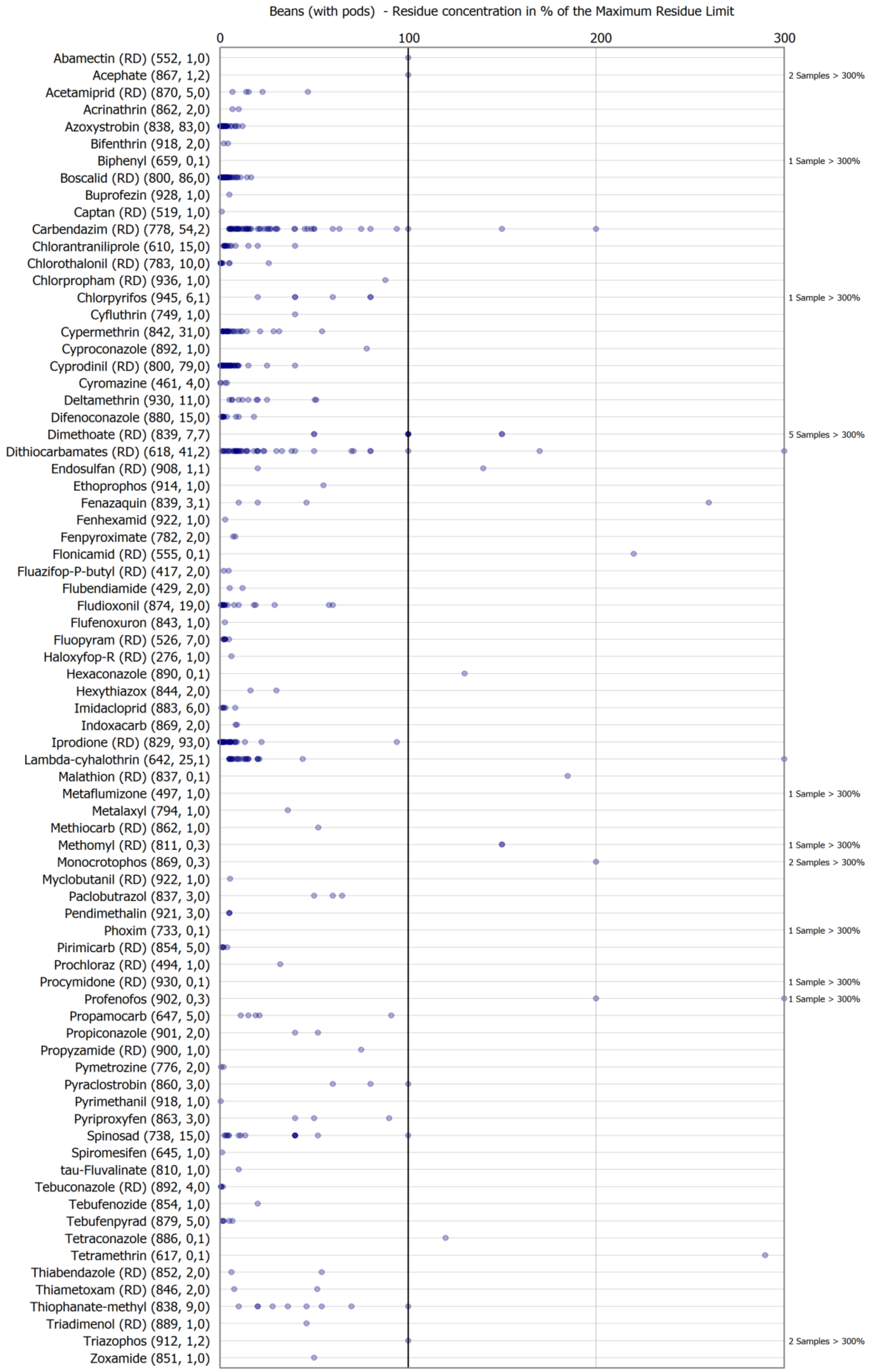


Figure 5: Residue concentrations measured in beans with pod, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 1: Pesticides most frequently detected in beans with pods in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Iprodione (RD)	10.1	Approved fungicide
Boscalid (RD)	9.7	Approved fungicide
Azoxystrobin	9.0	Approved fungicide
Cyprodinil (RD)	9.0	Approved fungicide
Carbendazim (RD)	6.5	Fungicide, approved until 30/11/2014

3.3.2. Carrots

In 2014, 1,256 samples of carrots were analysed; in 719 samples (57.2%), no pesticide residues were detected, while 537 samples (42.8%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 204 samples (16.2%); up to 7 different pesticides were detected in an individual carrot sample (Figure 6). Compared to 2011, the overall detection rate remained in the same range (2011: 42.7% of the samples contained pesticide residues).

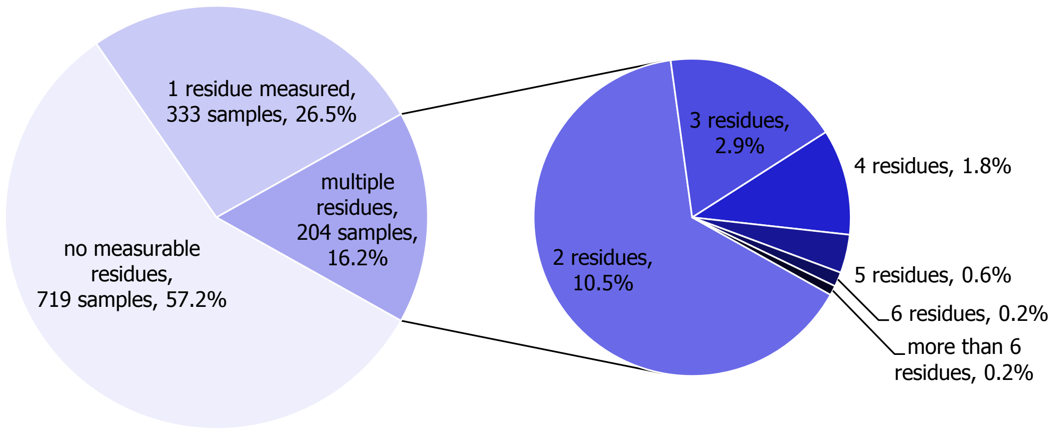


Figure 6: Number of detectable residues in individual carrot samples

In 2.1% of the samples (26 samples), the residue concentrations exceeded the MRLs; 0.7% of the samples (9 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were mainly related to EU products (23 samples).

In total, 54 different pesticides were detected. The most frequently found pesticides were boscalid (RD) (detected in 23.1% of the tested samples), linuron (7.7%) and azoxystrobin (7.6%). The MRL was exceeded for 12 different pesticides, most frequently for chlorpyrifos (12 samples, 5 from Greece, 2 from Spain and 1 each from Turkey, Malta, Portugal, Romania and Poland) and dieldrin (RD) (2 samples from Albania and France).

Figure 7 depicts the results for all pesticides with MRL exceedances and the most frequently detected pesticides. Compared to 2011, the detection rate was slightly lower or in the same range for most pesticides, except for boscalid where an increased detection rate was observed. An increased MRL exceedance rate was noted for chlorpyrifos, but also a number of pesticides was found exceeding the MRL where no such event was noted in 2011 (e.g. dieldrin (RD), trifluralin, propyzamide (RD), etc.). The detection rate for linuron has decreased in 2014 compared to 2011.

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 8. Further information on the most frequently detected pesticides found in carrots in 2014 in at least 5% of the samples is compiled in Table 2.

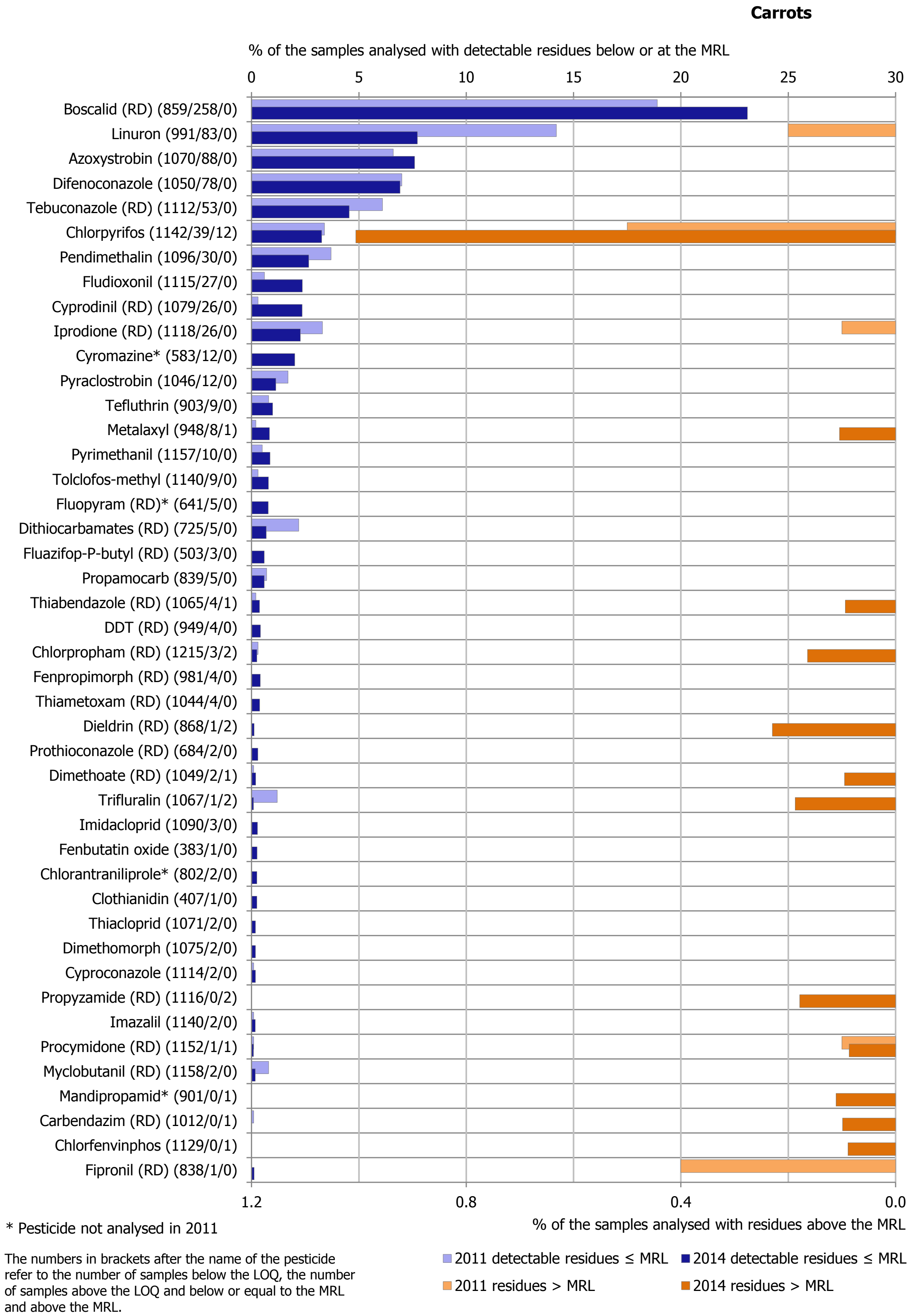


Figure 7: Percentage of carrots samples with detectable residues below or equal to the MRL and with residues above the MRL

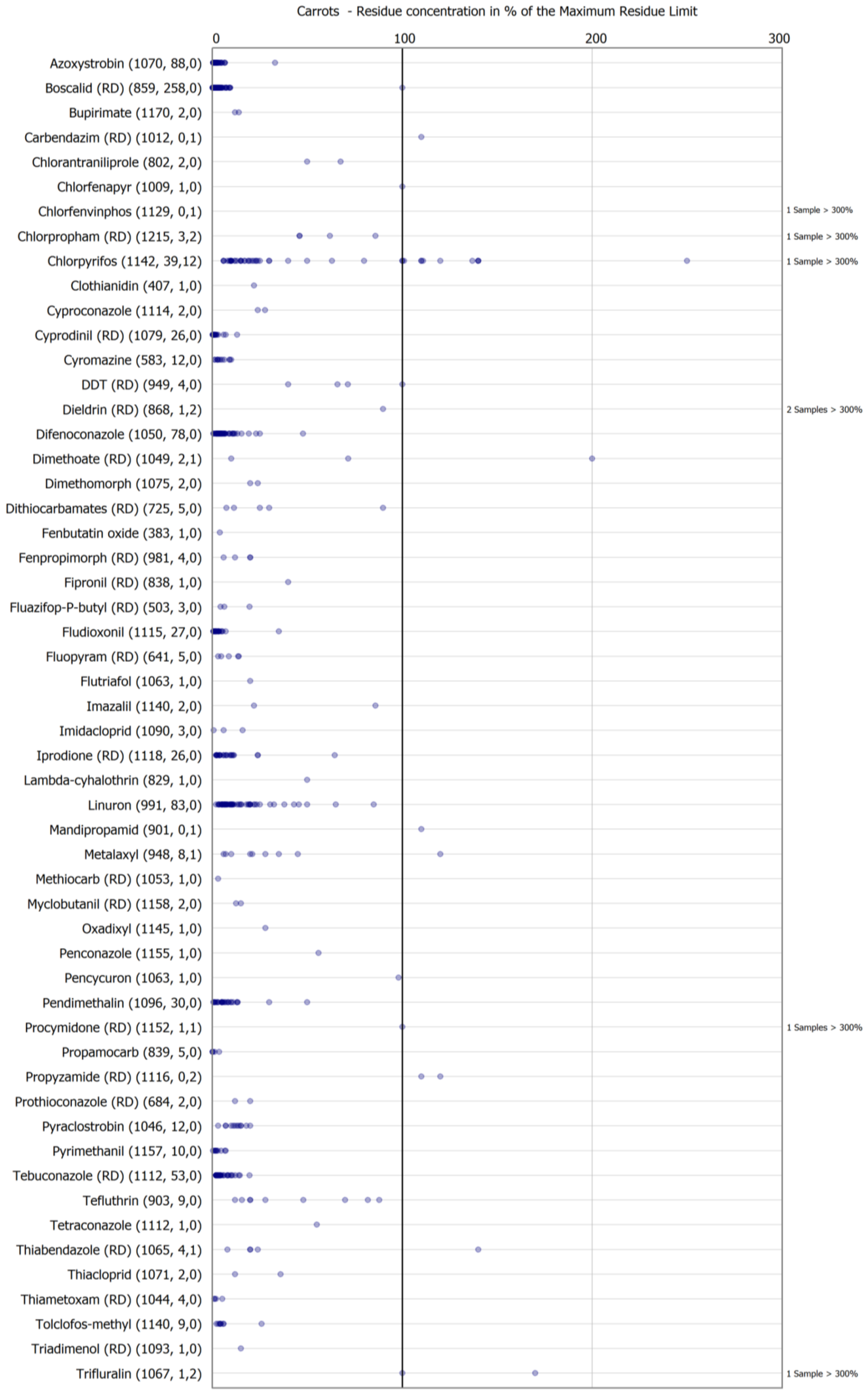


Figure 8: Residue concentrations measured in carrots, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 2: Pesticides most frequently detected in carrots in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Boscalid (RD)	23.1	Approved fungicide
Linuron	7.7	Approved herbicide
Azoxystrobin	7.6	Approved fungicide
Difenoconazole	6.9	Approved fungicide

3.3.3. Cucumbers

In 2014, 1,263 samples of cucumbers were analysed; in 644 samples (51%), no pesticide residues were detected, while 619 samples (49%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 336 samples (26.6%); up to 14 different pesticides were detected in an individual cucumber sample (Figure 9). Compared to 2011, the overall detection rate slightly went up (2011: 47.0% of the samples contained pesticide residues).

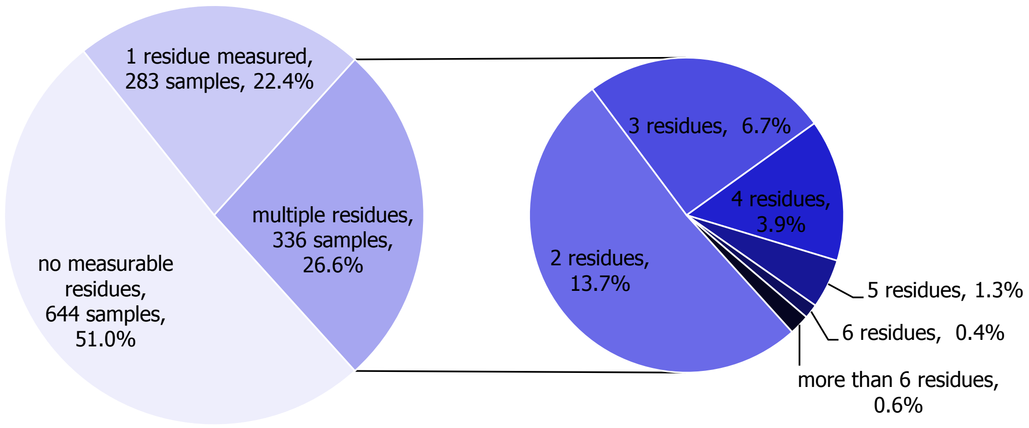


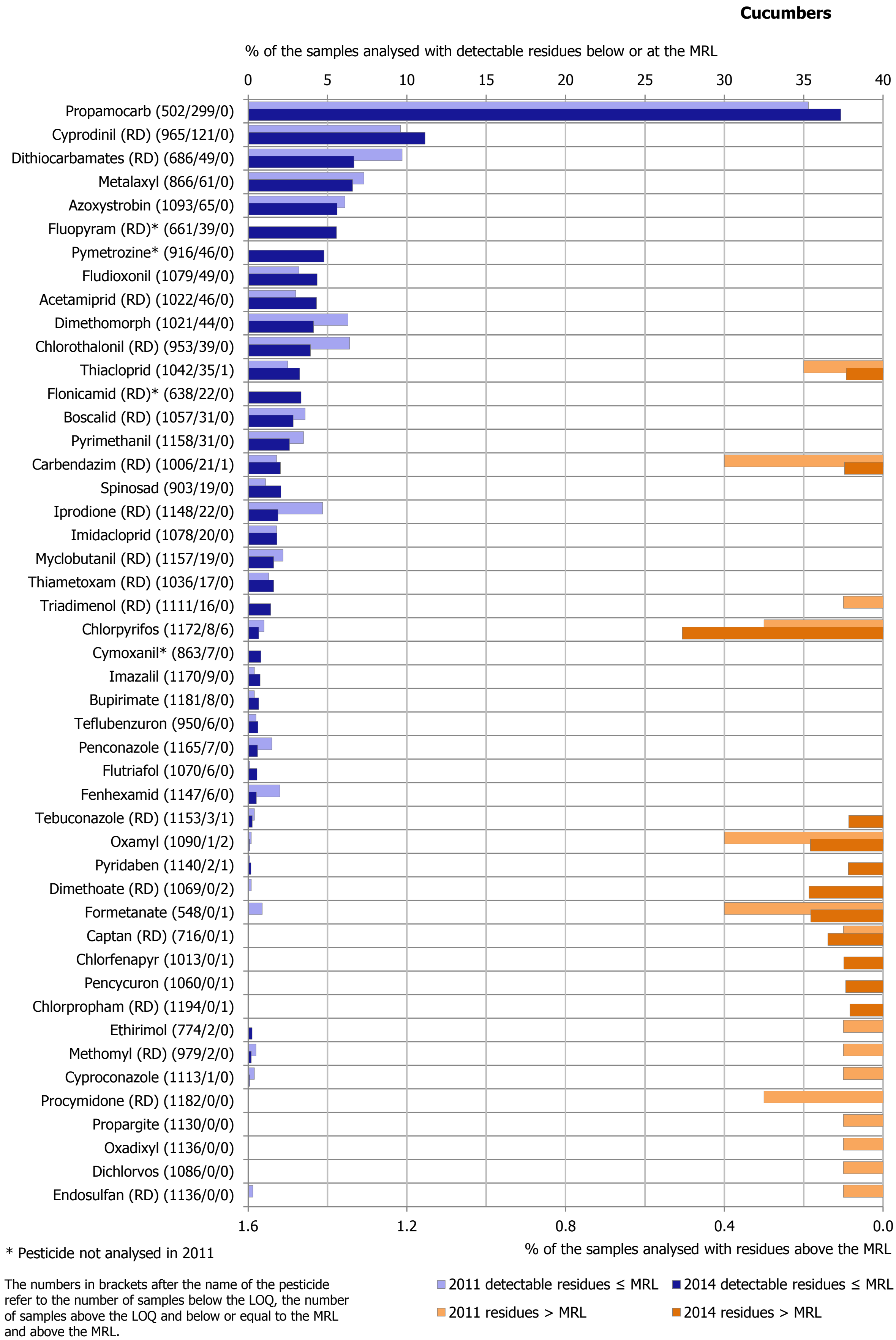
Figure 9: Number of detectable residues in individual cucumber samples

In 1.5% of the samples (19 samples), the residue concentrations exceeded the MRLs; 0.6% of the samples (8 samples) were reported as non-compliant, taking into account the measurement uncertainty.

In total, 68 different pesticides were detected. The most frequently found pesticides were propamocarb (detected in 37% of the tested samples), cyprodinil (RD) (11.1%) and dithiocarbamates (RD) (6.7%). The MRL was exceeded for 12 different pesticides, most frequently for chlorpyrifos (RD) (2 samples from Italy and Romania each, 1 sample from Malta and the Former Yugoslav Republic of Macedonia) and dimethoate (RD) (1 sample from Slovenia and Romania).

Figure 10 depicts the results for all pesticides with MRL exceedances and the most frequently detected pesticides with residues below or at the MRL. Compared to 2011, the overall detection rates and MRL exceedance rates were in the same range.

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 11. Further information on the most frequently detected pesticides found in cucumbers in 2014 in at least 5% of the samples is compiled in Table 3.



* Pesticide not analysed in 2011

The numbers in brackets after the name of the pesticide refer to the number of samples below the LOQ, the number of samples above the LOQ and below or equal to the MRL and above the MRL.

Figure 10: Percentage of cucumbers samples with detectable residues below or equal to the MRL and with residues above the MRL

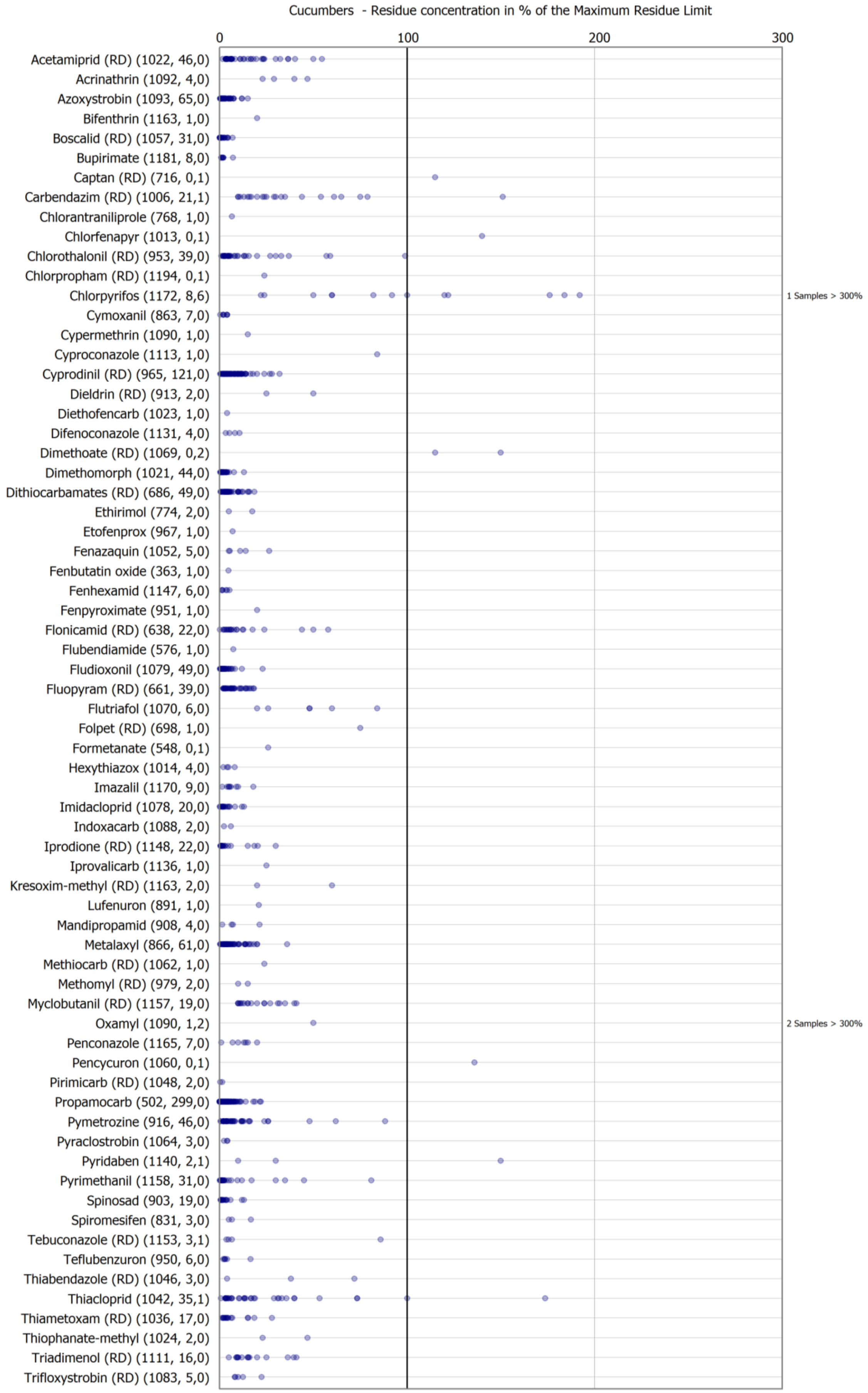


Figure 11: Residue concentrations measured in cucumbers, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 3: Pesticides most frequently detected in cucumbers in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Propamocarb	37.3	Approved fungicide
Cyprodinil (RD)	11.1	Approved fungicide
Dithiocarbamates (RD)	6.7	Approved fungicide
Metalaxyl	6.6	Approved fungicide
Azoxystrobin	5.6	Approved fungicide
Fluopyram (RD)	5.6	Approved fungicide

3.3.4. Mandarins

According to the 2014 monitoring regulation, Member States had the choice to analyse mandarins or oranges. Since the legal limits are not necessarily the same for these two food products, EFSA performed a separate analysis for mandarins and oranges, respectively.

In 2014, 493 samples of mandarins were analysed; in 103 samples (20.9%), no pesticide residues were detected, while 390 samples (79.1%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 319 samples (64.7%); up to 9 different pesticides were detected in an individual mandarins sample (Figure 12). Compared to 2011, the overall detection rate decreased slightly (2011 samples: 85.7% contained pesticide residues).

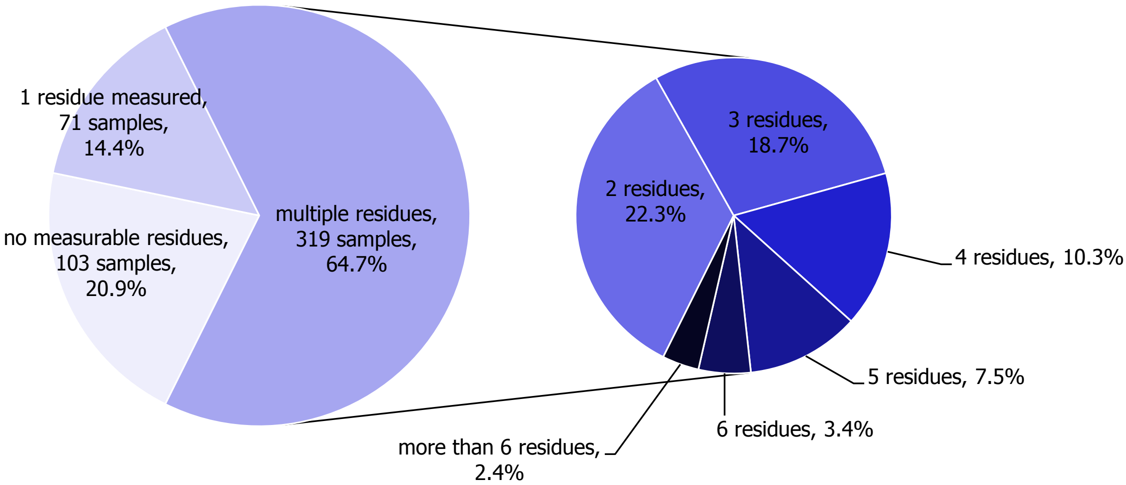


Figure 12: Number of detectable residues in individual mandarin samples

In 2.6% of the samples (13 samples), the residue concentrations exceeded the MRLs; 0.8% of the samples (4 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were mainly related to products grown in the EU compared to those imported (4 samples from Spain, 2 samples from Morocco, Israel and France, respectively, and 1 each from Greece, Portugal and Turkey).

In total, 52 different pesticides were detected. The most frequently found pesticides were imazalil (detected in 69.8% of the tested samples), chlorpyrifos (37.4%) and thiabendazole (RD) (31.7%). The MRL was exceeded for 9 different pesticides, most frequently for dimethoate (RD) (3 samples) and imazalil (3 samples).

Figure 13 depicts the results for all pesticides with MRL exceedances and the most frequently detected pesticides with residues below or at the MRL. Compared to 2011, the 2014 detection rate was slightly lower for most pesticides, except for imazalil, thiabendazole, pyrimethanil and propiconazole where an increase was observed. Compared to 2011, an increased number of MRL exceedance was noted for some pesticides, mainly insecticides/acaricides (e.g. dimethoate (RD), dicofol, fenthion and fenvalerate (RD) and imazalil). It should be also highlighted that some of the MRL exceedances identified in 2014 refer to non-approved pesticides (dicofol, diazinon and fenthion).

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 14. Further information on the most frequently detected pesticides found in mandarins in 2014 in at least 10% of the samples is compiled in Table 4.

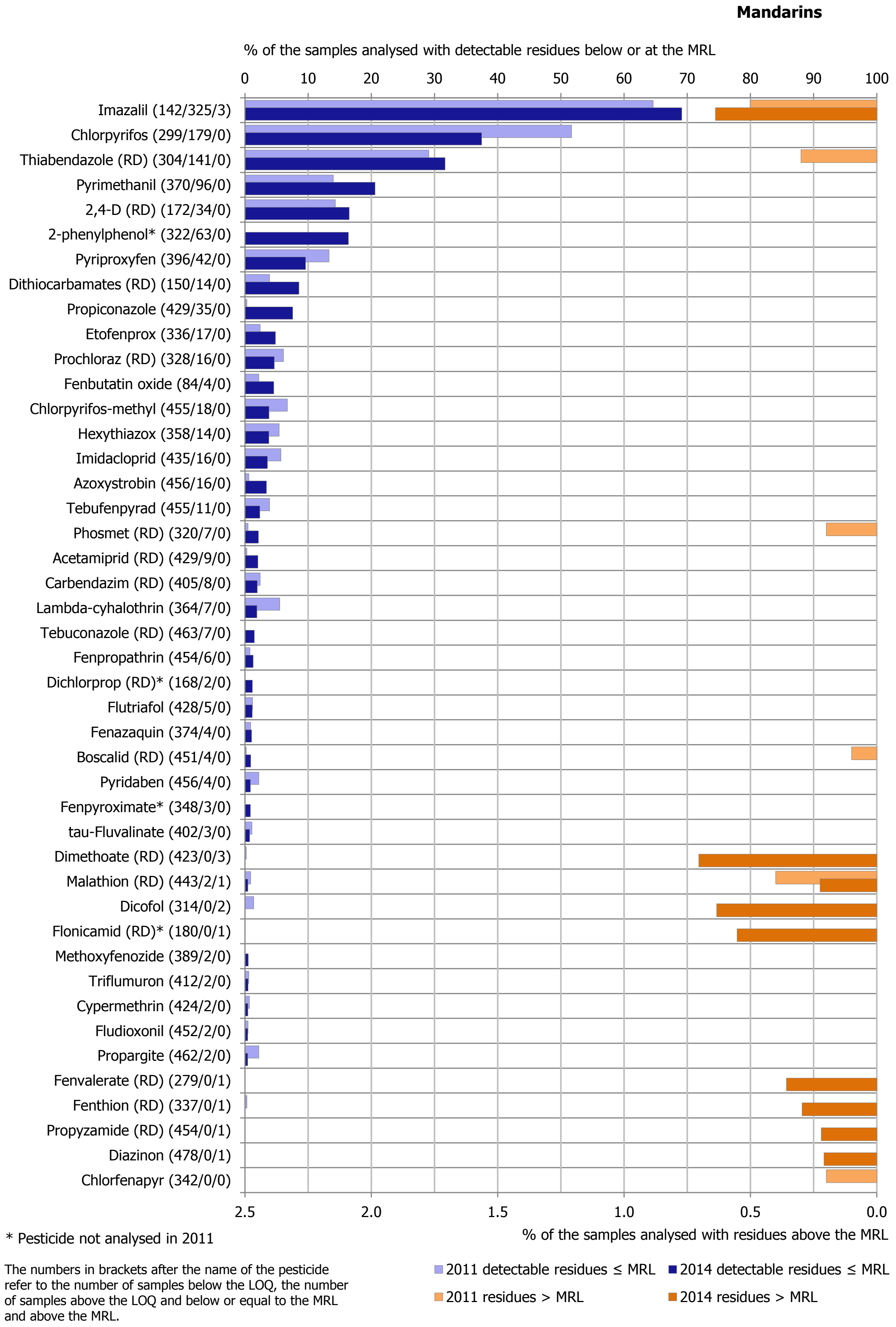


Figure 13: Percentage of mandarin samples with detectable residues below or equal to the MRL and with residues above the MRL

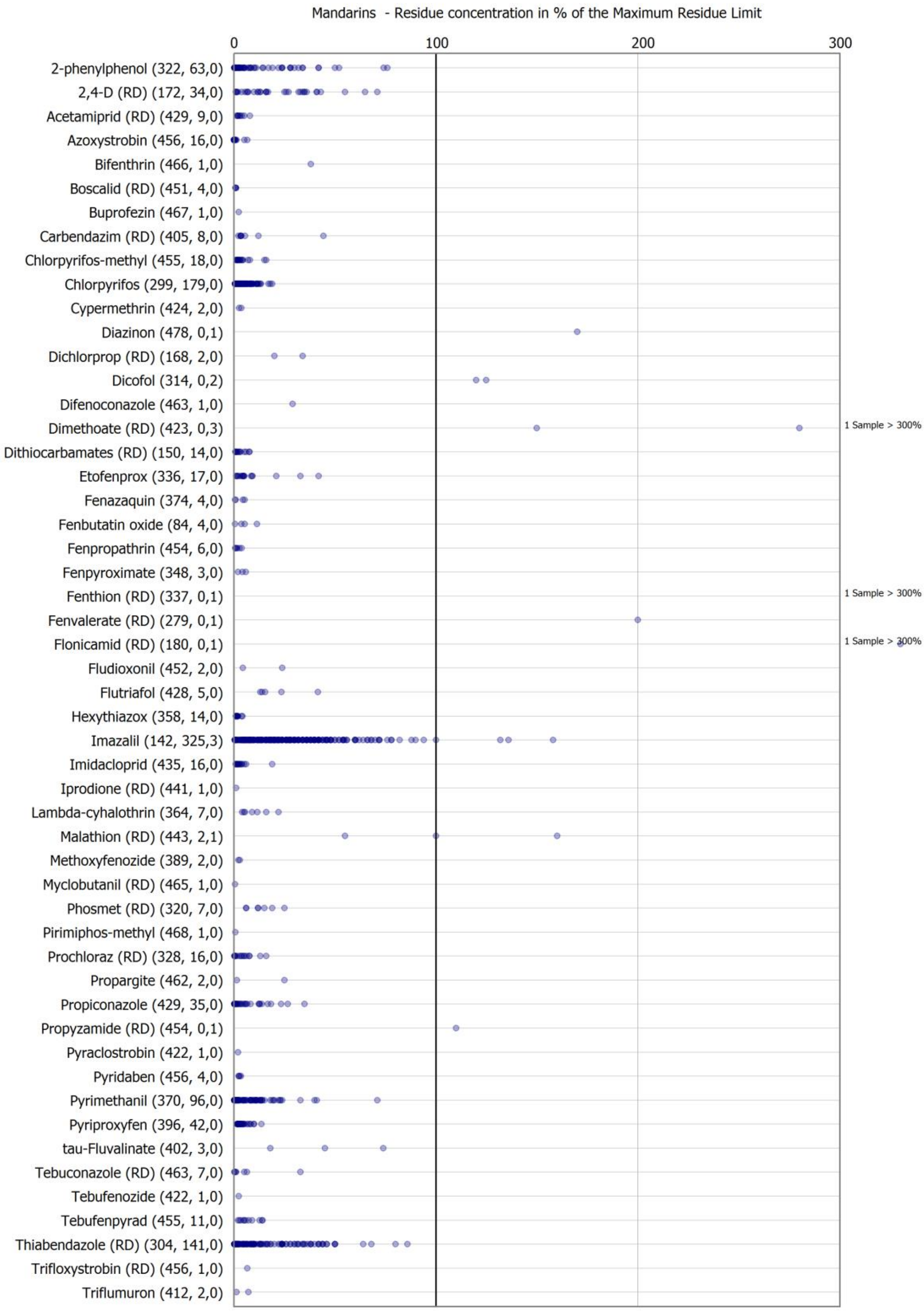


Figure 14: Residue concentrations measured in mandarins, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 4: Pesticides most frequently detected in mandarins in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Imazalil	69.8	Approved fungicide
Chlorpyrifos	37.4	Approved insecticide
Thiabendazole (RD)	31.7	Approved fungicide
Pyrimethanil	20.6	Approved fungicide
2,4-D (RD)	16.5	Approved herbicide and plant growth regulator
2-phenylphenol	16.4	Approved fungicide, used also for post-harvest treatment

3.3.5. Oranges

In 2014, 1,100 samples of oranges were analysed; in 225 samples (20.5%), no pesticide residues were detected, while 875 samples (79.6%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 665 samples (60.5%); up to 9 different pesticides were detected in an individual oranges sample (Figure 15). Compared to 2011, the overall detection rate remained stable (2011 samples: 80.3% contained pesticide residues).

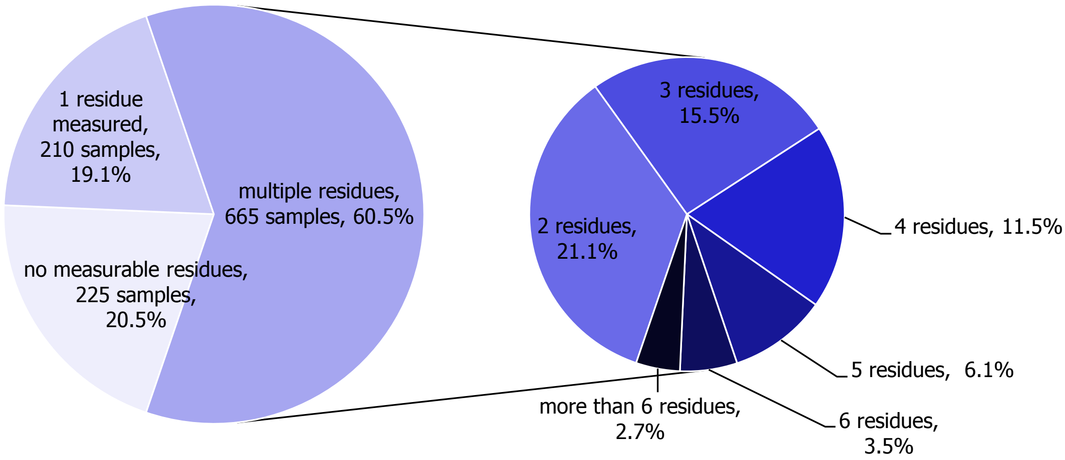


Figure 15: Number of detectable residues in individual orange samples

In 1.5% of the samples (16 samples), the residue concentrations exceeded the MRLs; 1.1% of the samples (12 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were mainly related to products imported from third countries (13 samples).

In total, 65 different pesticides were detected. The most frequently found pesticides were imazalil (detected in 76.2% of the tested samples), chlorpyrifos (33.5%) and thiabendazole (RD) (31.2%). The MRL was exceeded for 11 different pesticides, most frequently for malathion (RD) (3 sample from which 1 from Zimbabwe, 1 from Egypt and 1 from South Africa) and imazalil (3 samples from which 2 were from South Africa and 1 from Italy).

Figure 16 depicts the results for all pesticides with MRL exceedances and the most frequently detected pesticides with residues below or at the MRL. Compared to 2011, the detection rate was slightly higher for imazalil, pyrimethanil, dithiocarbamates (RD), 2,4-D (RD) and thiabendazole (RD) whereas chlorpyrifos was found less frequently. An MRL exceedance was noted for fenvalerate (RD) and ethephon, while no such events occurred in 2011.

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 17. Further information on the most frequently detected pesticides found in oranges in 2014 in at least 10% of the samples is compiled in Table 5.

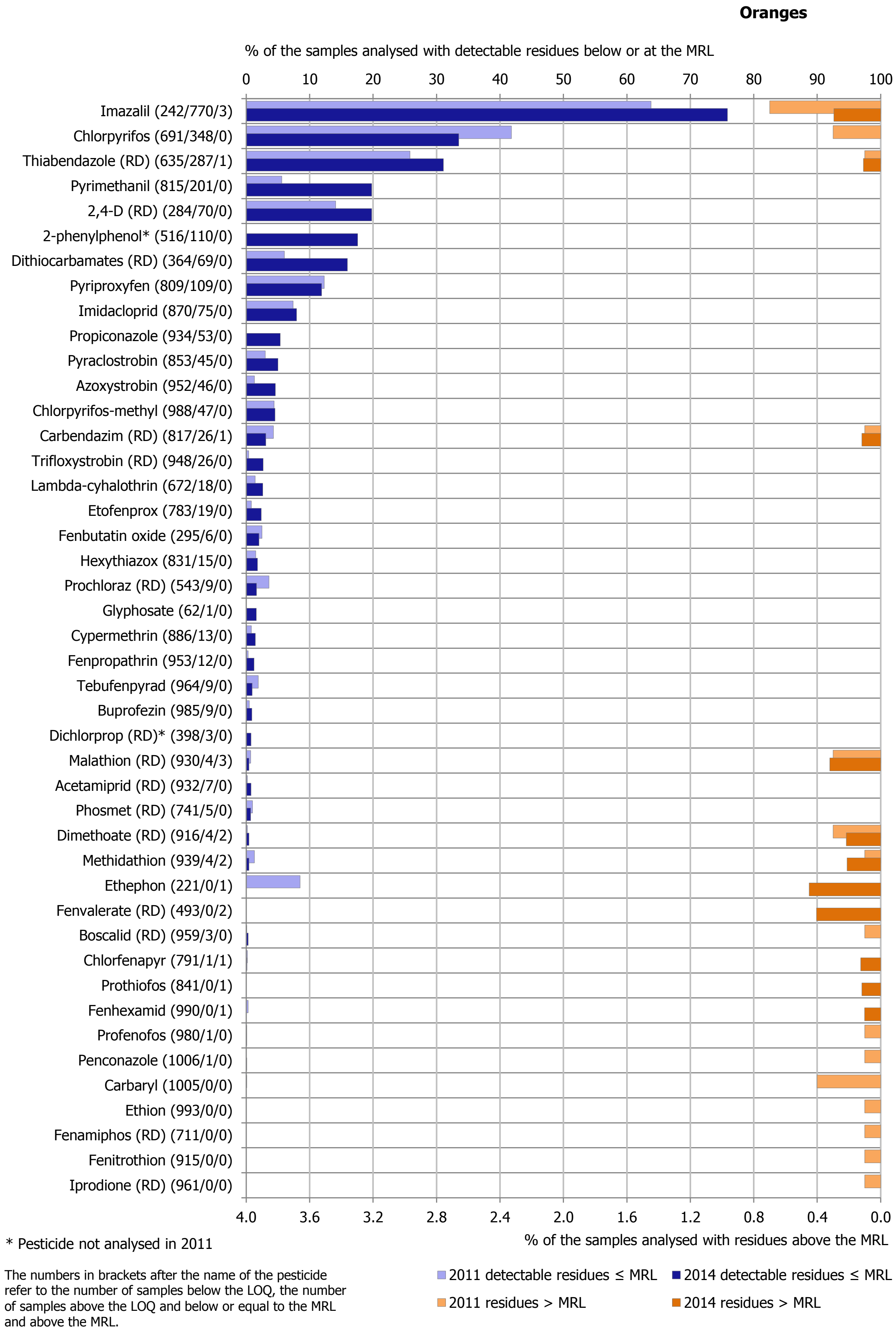


Figure 16: Percentage of orange samples with detectable residues below or equal to the MRL and with residues above the MRL

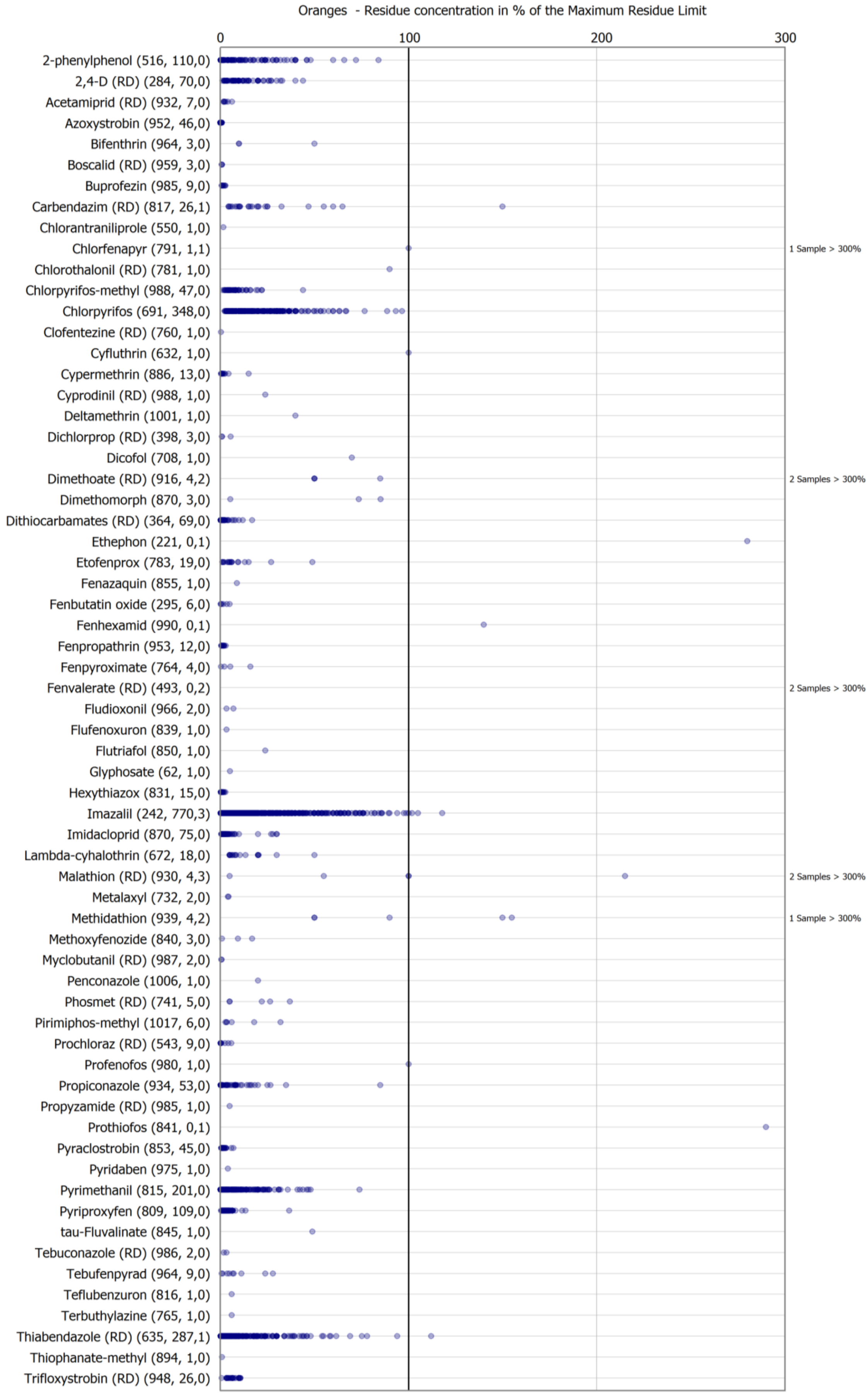


Figure 17: Residue concentrations measured in oranges, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 5: Pesticides most frequently detected in oranges in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Imazalil	76.2	Approved fungicide
Chlorpyrifos	33.5	Approved insecticide
Thiabendazole (RD)	31.2	Approved fungicide
Pyrimethanil	19.8	Approved fungicide
2,4-D (RD)	19.8	Approved herbicide and plant growth regulator
2-phenylphenol	17.6	Approved fungicide, used also for post-harvest treatment
Dithiocarbamates (RD)	15.9	Group of fungicides
Pyriproxyfen	11.9	Approved insecticide

3.3.6. Pears

In 2014, 1,245 samples of pears were analysed; in 312 samples (25.1%), no pesticide residues were detected, while 933 samples (74.9%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 717 samples (57.6%); up to 14 different pesticides were detected in an individual pear sample (Figure 18). Compared to 2011, the overall detection rate increased (2011: 70.8% of the samples contained pesticide residues).

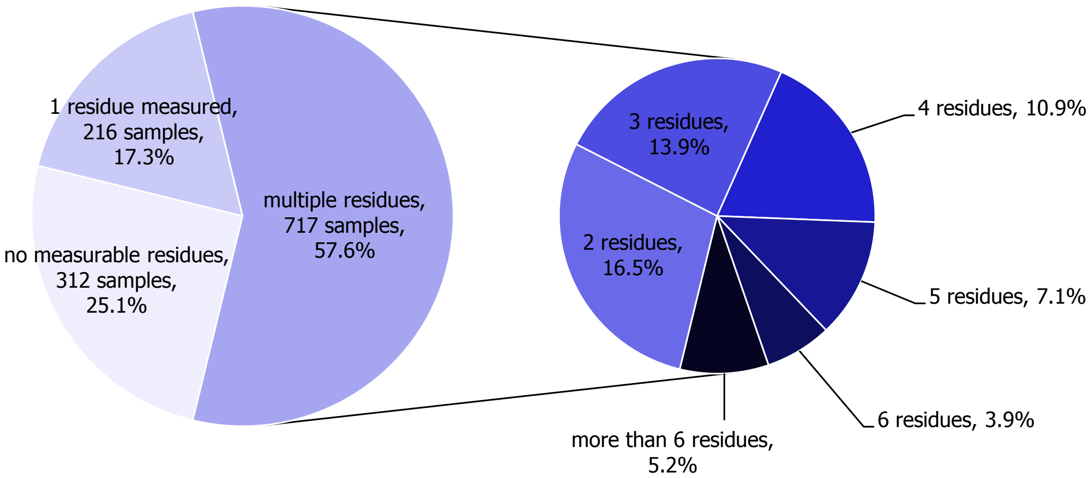


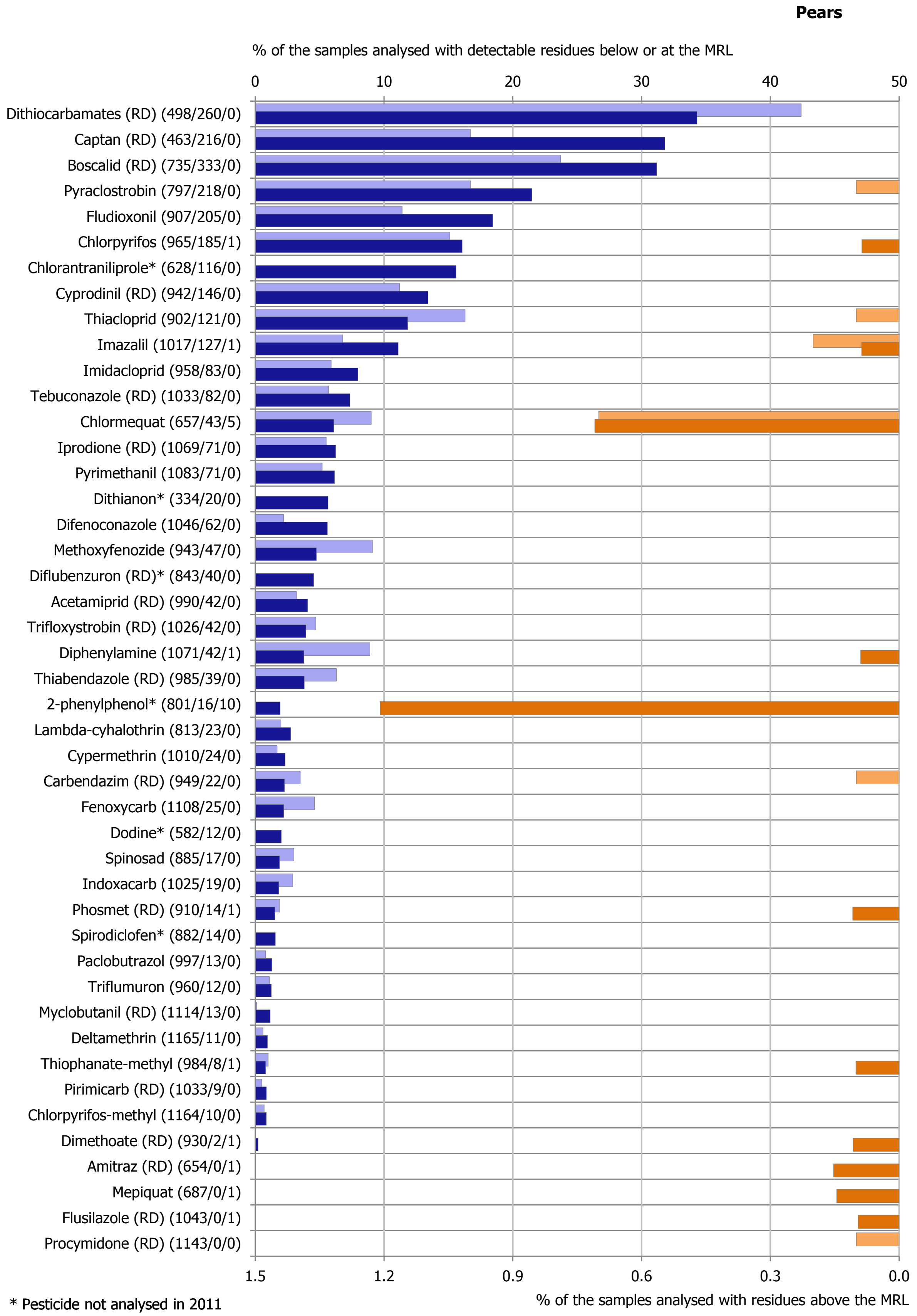
Figure 18: Number of detectable residues in individual pear samples

In 1.6% of the samples (20 samples), the residue concentrations exceeded the MRLs; 0.9% of the samples (11 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were all related to products grown in the EU.

In total, 81 different pesticides were detected. The most frequently found pesticides were dithiocarbamates (RD) (detected in 34.3% of the tested samples), captan (RD) (31.8%) and boscalid (RD) (31.2%). The MRL was exceeded for 11 pesticides, most frequently for 2-phenylphenol (10 samples all from Spain) and chlormequat (5 samples from which 3 were from Spain, 1 from the Netherlands and 1 from Poland).

Figure 19 depicts the results for all pesticides with MRL exceedances and the most frequently detected pesticides with residues below or at the MRL. Compared to 2011, the detection rate was in the same range for most pesticides, except for captan (RD), boscalid (RD) and fludioxonil where an increased detection rate was observed. The detection rate for dithiocarbamates (RD) and diphenylamine has decreased compared to 2011. For 2-phenylphenol, a pesticide that was not yet analysed in 2011, a number of MRL exceedances was identified.

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 20. Further information on the most frequently detected pesticides found in pears in 2014 in at least 10% of the samples is compiled in Table 6.



* Pesticide not analysed in 2011

The numbers in brackets after the name of the pesticide refer to the number of samples below the LOQ, the number of samples above the LOQ and below or equal to the MRL and above the MRL.

Figure 19: Percentage of pear samples with detectable residues below or equal to the MRL and with residues above the MRL

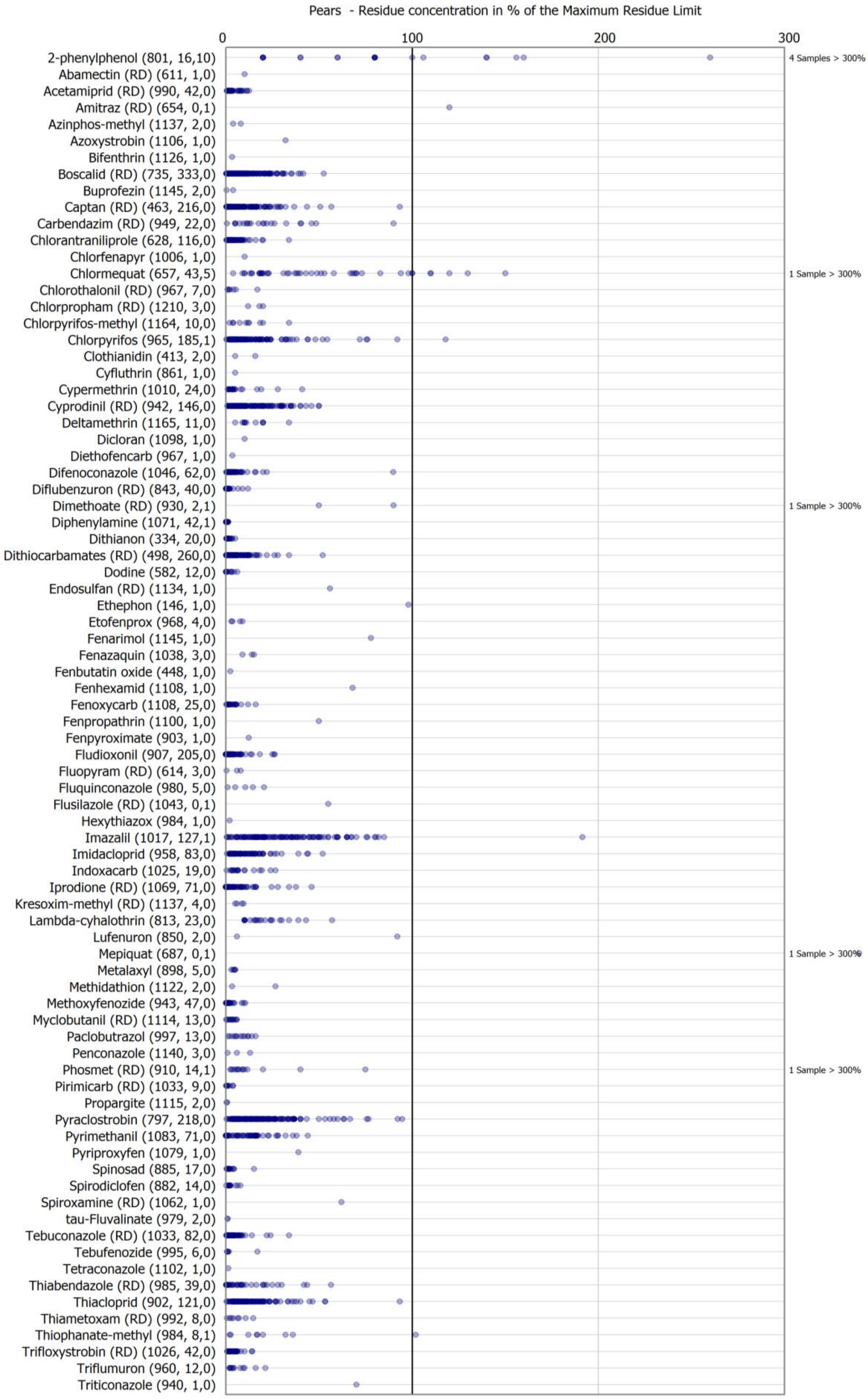


Figure 20: Residue concentrations measured in pears, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 6: Pesticides most frequently detected in pears in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Dithiocarbamates (RD)	34.3	Group of different fungicides
Captan (RD)	31.8	Approved fungicide
Boscalid (RD)	31.2	Approved fungicide
Pyraclostrobin	21.5	Approved fungicide and plant growth regulator
Fludioxonil	18.4	Approved fungicide
Chlorpyrifos	16.2	Approved insecticide
Chlorantraniliprole	15.6	Approved insecticide
Cyprodinil (RD)	13.4	Approved fungicide
Thiacloprid	11.8	Approved insecticide
Imazalil	11.2	Approved fungicide

3.3.7. Potatoes

In 2014, 1,456 samples of potatoes were analysed; in 1,033 samples (70.9%), no pesticide residues were detected, while 423 samples (29.1%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 109 samples (7.5%); up to 6 different pesticides were detected in an individual potato sample (Figure 21). Compared to 2011, the overall detection rate increased (2011: 23.8% of the samples contained pesticide residues).

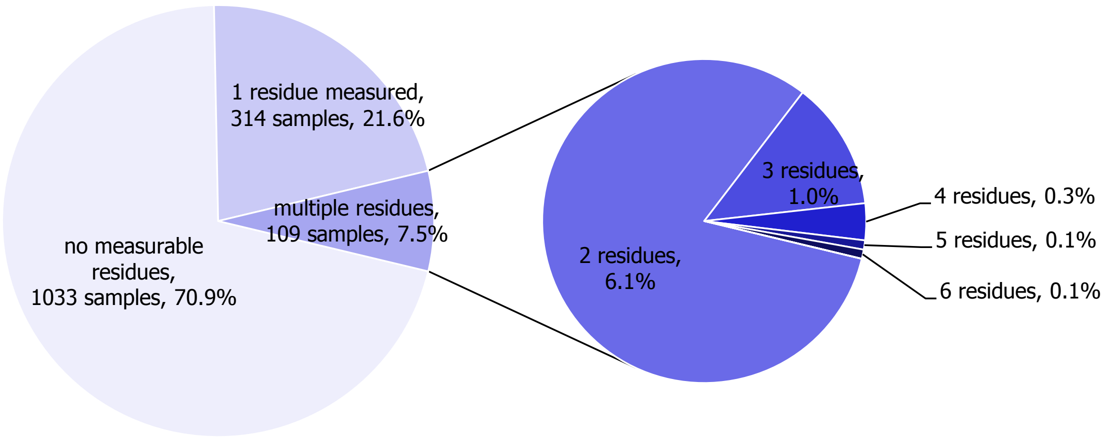


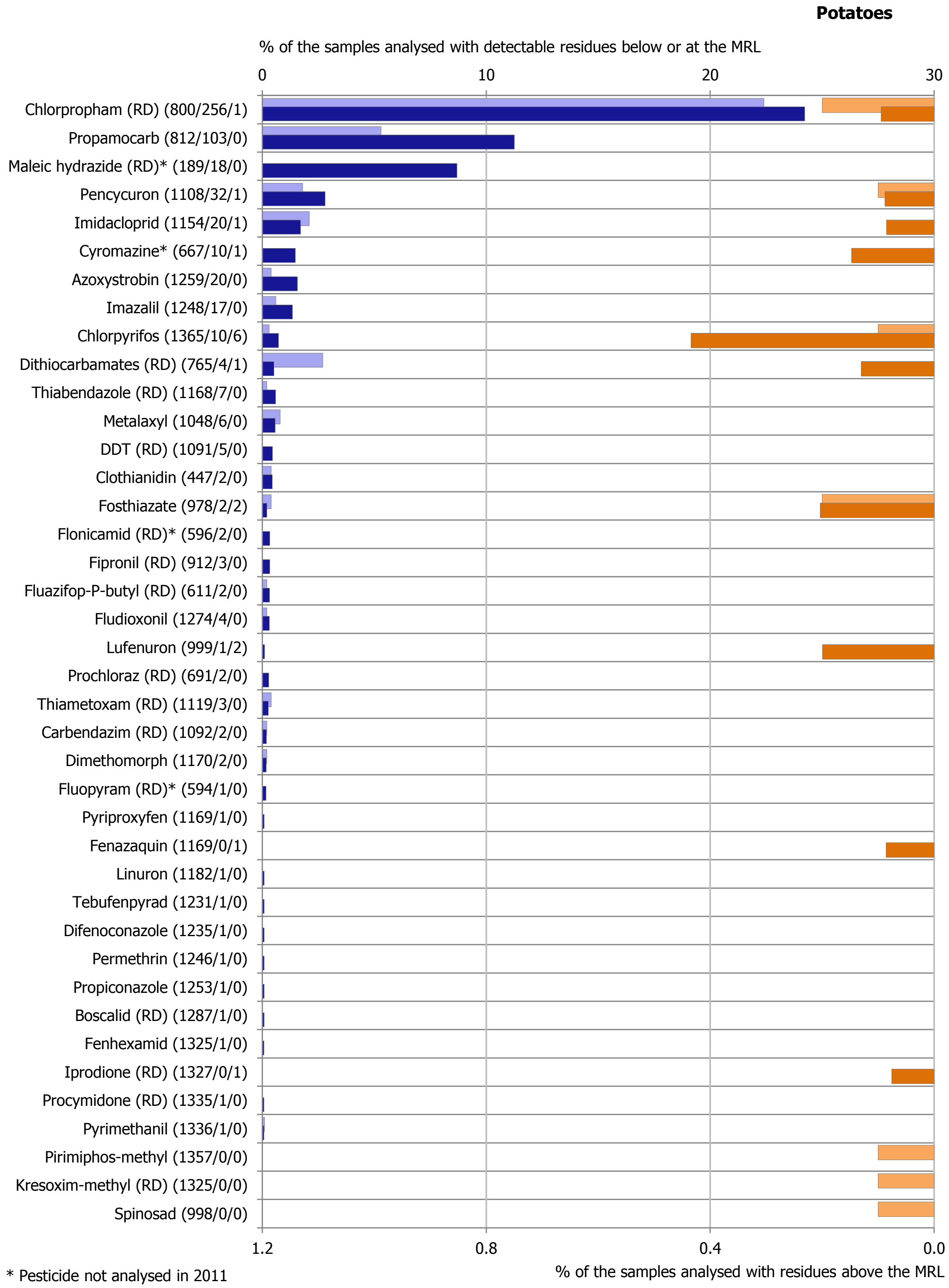
Figure 21: Number of detectable residues in individual potato samples

In 1.1% of the samples (16 samples), the residue concentrations exceeded the MRLs; 0.5% of the samples (7 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were all related to products grown in the EU.

In total, 37 different pesticides were detected. The most frequently found pesticides were chlorpropham (RD) (detected in 24.3% of the tested samples), propamocarb (11.3%) and maleic hydrazide (RD) (8.7%). The MRL was exceeded for 10 different pesticides, most frequently for chlorpyrifos (6 samples from which 2 were from Malta, 1 from Spain, 1 from Slovenia, 1 from Italy and 1 from Greece), fosthiazate (2 samples from France) and lufenuron (2 samples from Malta).

Figure 22 depicts the results for all pesticides with MRL exceedances and all detected pesticides with residues below or at the MRL. Compared to 2011, the detection rate was in the same range for most pesticides, except for propamocarb where an increased detection rate was observed. MRL exceedances increased or were noted for the first time for imidacloprid, cyromazine, dithiocarbamates (RD), chlorpyrifos, lufenuron, fenazaquin and iprodione).

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 23. Further information on the most frequently detected pesticides found in potatoes in 2014 in at least 5% of the samples is compiled in Table 7.



* Pesticide not analysed in 2011

The numbers in brackets after the name of the pesticide refer to the number of samples below the LOQ, the number of samples above the LOQ and below or equal to the MRL and above the MRL.

Figure 22: Percentage of potato samples with detectable residues below or equal to the MRL and with residues above the MRL

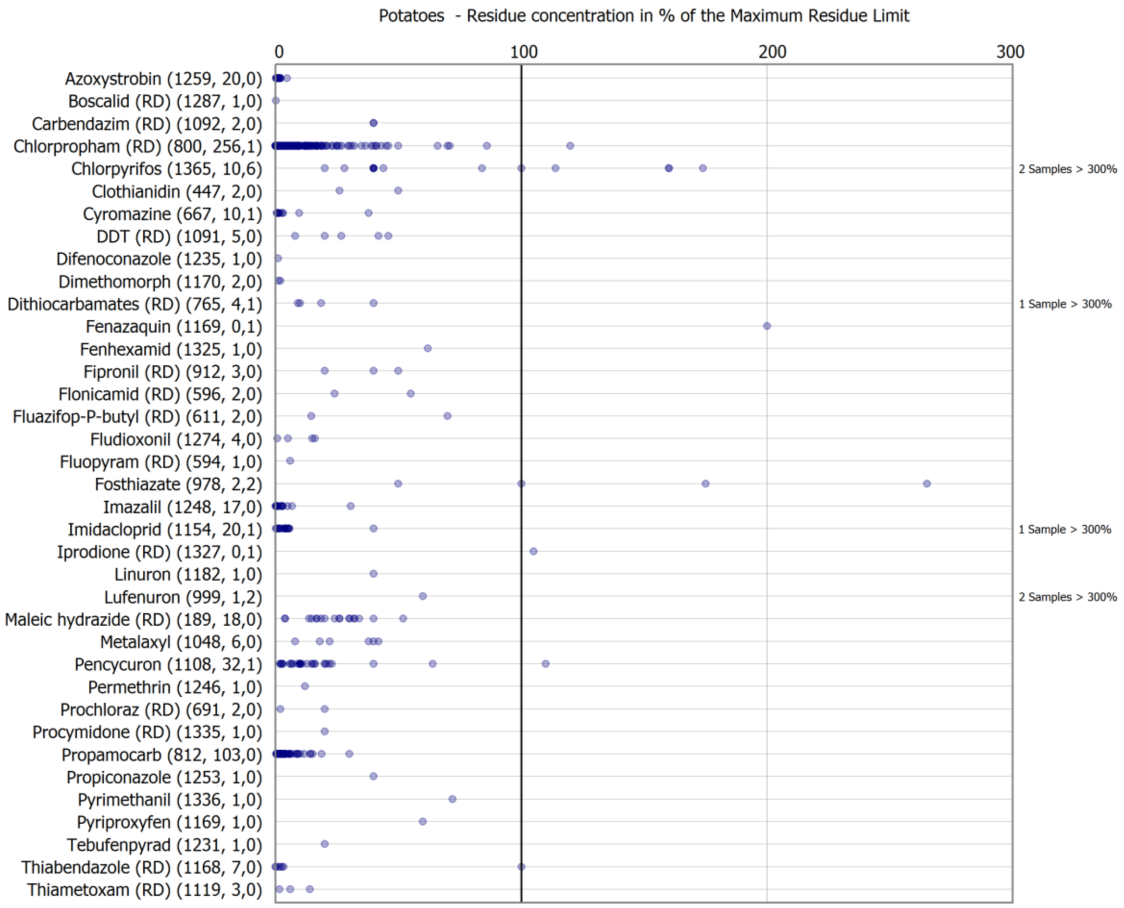


Figure 23: Residue concentrations measured in potatoes, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 7: Pesticides most frequently detected in potatoes in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Chlorpropham (RD)	24.3	Approved herbicide and plant growth regulator (sprout suppressor)
Propamocarb	11.3	Approved fungicide
Maleic hydrazide (RD)	8.7	Approved plant growth regulator

3.3.8. Spinach

In 2014, 952 samples of spinach were analysed; in 588 samples (61.8%), no pesticide residues were detected, while 364 samples (38.2%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 175 samples (18.4%); up to 7 different pesticides were detected in an individual spinach sample (Figure 24). Compared to 2011, the overall detection rate decreased (2011: 46.7% of the samples contained pesticide residues).

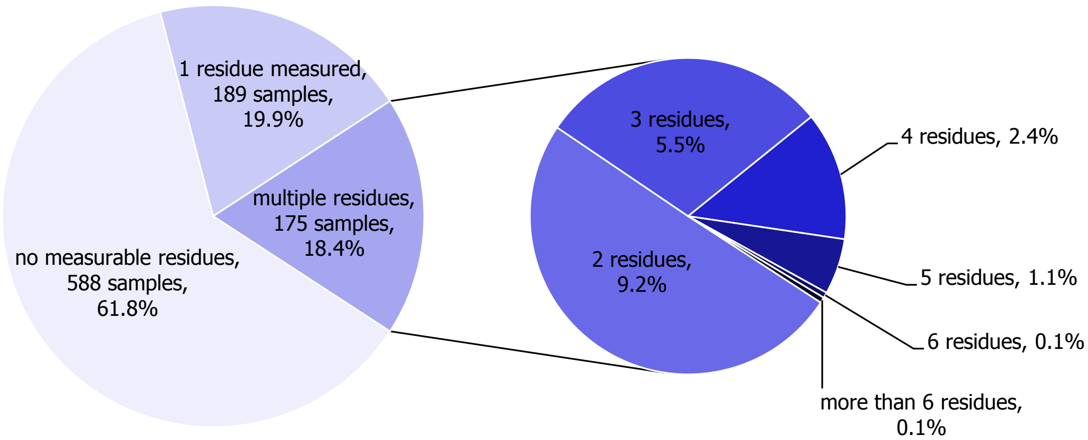


Figure 24: Number of detectable residues in individual spinach samples

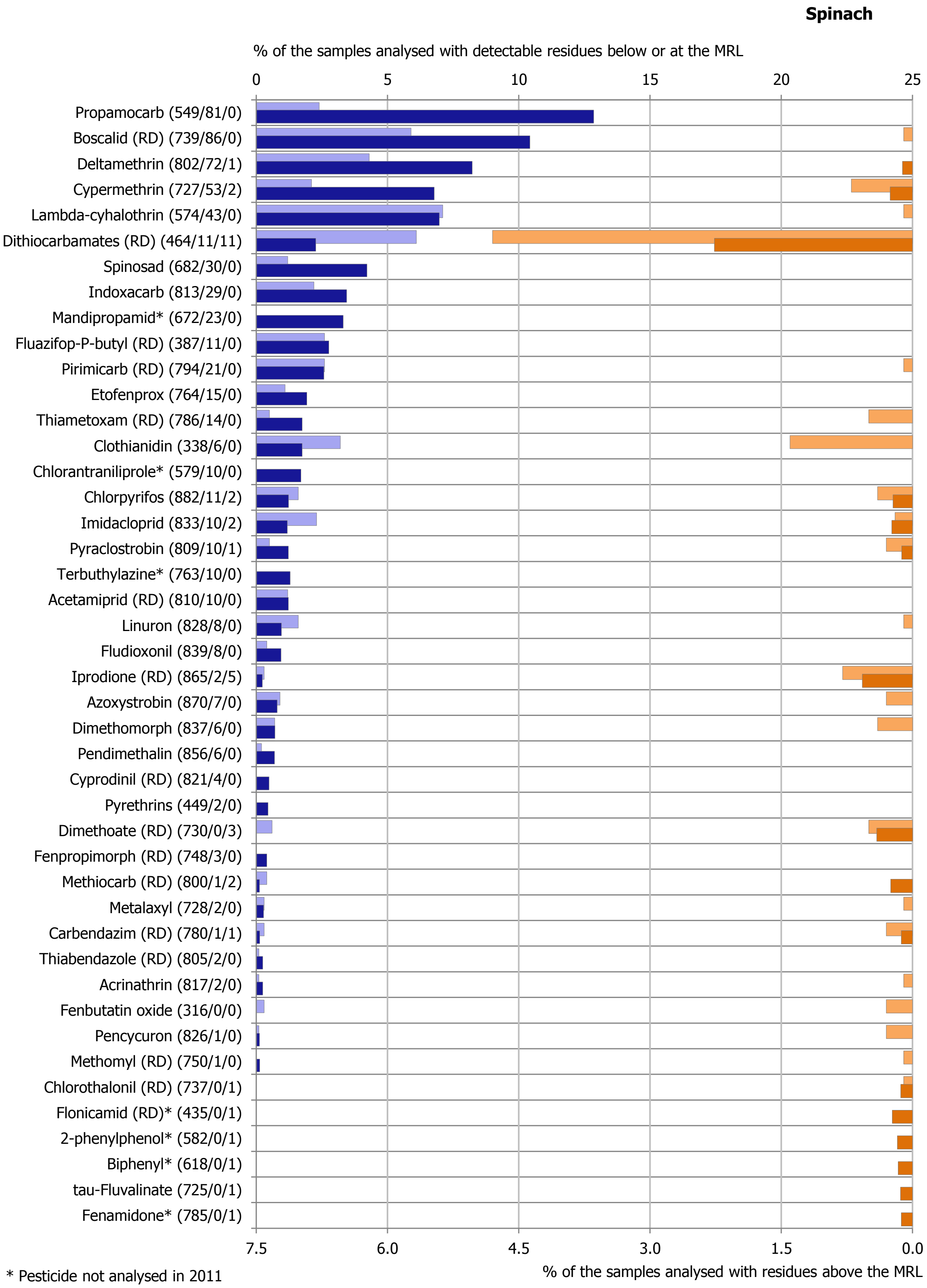
In 3.4% of the samples (32 samples), the residue concentrations exceeded the MRLs; 2.2% of the samples (21 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were mainly related to products grown in the EU (31 samples).

In total, 65 different pesticides were detected. The most frequently found pesticides[27] were propamocarb (detected in 12.9% of the tested samples) and boscalid (RD) (10.4%). The MRL was exceeded for 16 different pesticides, most frequently for dithiocarbamates (RD) (11 samples; 3 from Italy, 2 from Spain, 1 from Austria, 1 from Cyprus, 1 from Germany, 1 from Greece, 1 from Lithuania and 1 from Portugal) and iprodione (RD) (5 samples; 3 from Italy, 1 from France and 1 from Poland).

Figure 25 depicts the results for all pesticides with MRL exceedances and the most frequently detected pesticides with residues below or at the MRL. Compared to 2011, the detection rate increased for several pesticides, such as propamocarb, boscalid (RD), deltamethrin, cypermethrin and spinosad while a decline was noted for dithiocarbamates (RD). In general, a decreased rate on the number of MRL exceedances was noted in 2014 compared to 2011.

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 26. Further information on the most frequently detected pesticides found in spinach in 2014 in at least 5% of the samples is compiled in Table 8.

[27] One result was reported for bromide ion with a residue concentration above the LOQ. As only one sample was analysed for this substance, the detection rate of bromide ion (100%) is not presented in Figure 25.



* Pesticide not analysed in 2011

The numbers in brackets after the name of the pesticide refer to the number of samples below the LOQ, the number of samples above the LOQ and below or equal to the MRL and above the MRL.

Figure 25: Percentage of spinach samples with detectable residues below or equal to the MRL and with residues above the MRL

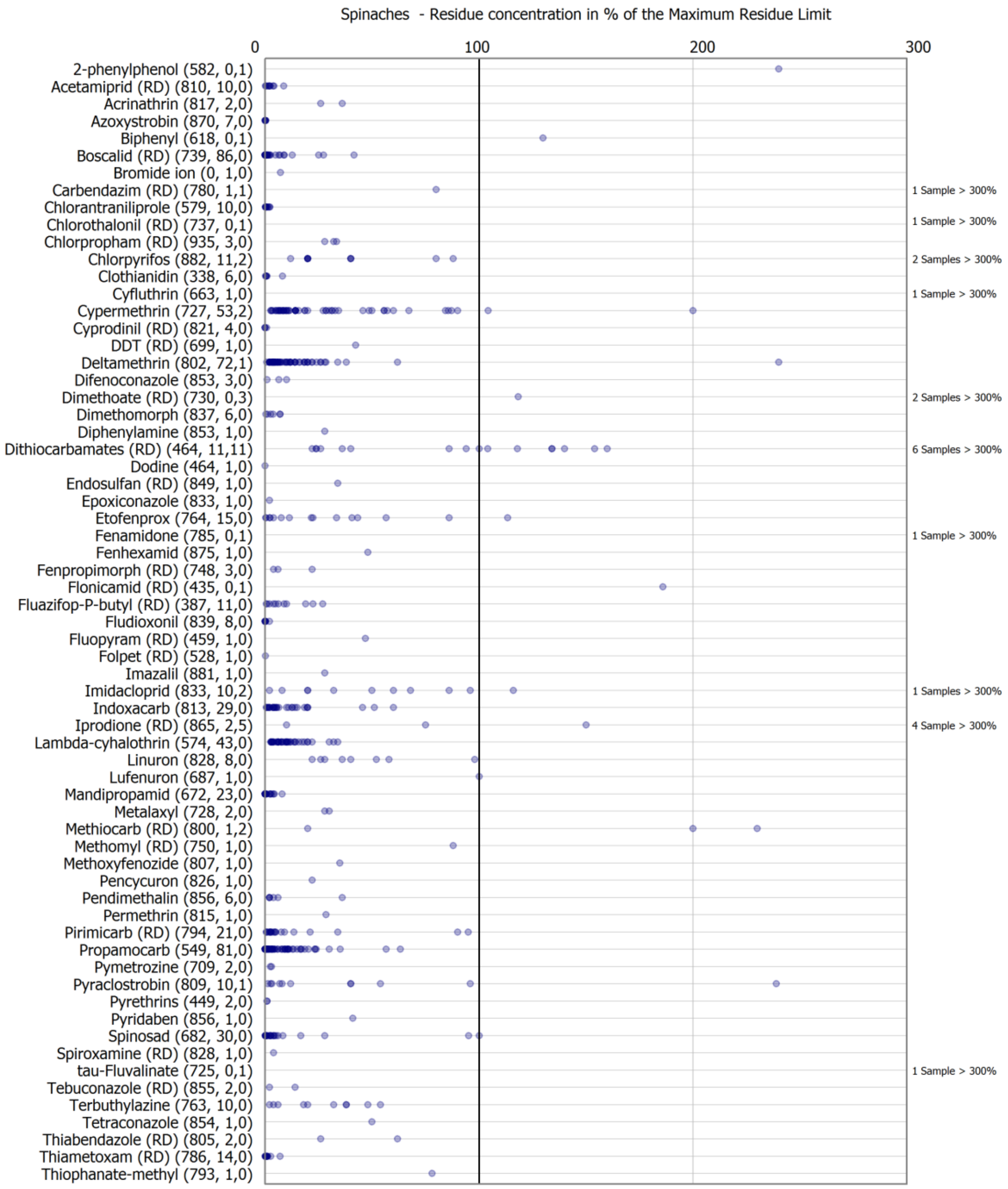


Figure 26: Residue concentrations measured in spinach, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 8: Pesticides most frequently detected in spinach in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Propamocarb	12.9	Approved fungicide
Boscalid (RD)	10.4	Approved fungicide
Deltamethrin	8.3	Approved insecticide
Cypermethrin	7.0	Approved insecticide
Lambda-cyhalothrin	7.0	Approved insecticide

3.3.9. Rice

According to the 2014 EU monitoring regulation, samples of unprocessed rice grain (brown rice) should be analysed for pesticide residues. However, since some of the reporting countries could not take the required number of unprocessed rice, samples of polished rice were analysed instead.

In total, 763 samples of rice (85 samples of polished rice and 678 samples of unprocessed rice) were analysed in 2014; in 554 samples (72.6%) no pesticide residues were detected, while 209 samples (27.4%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 70 samples (9.2%); up to 8 different pesticides were detected in an individual rice sample (Figure 27). Compared to 2011, the overall detection rate decreased slightly (2011: 29.4% of the samples contained pesticide residues).

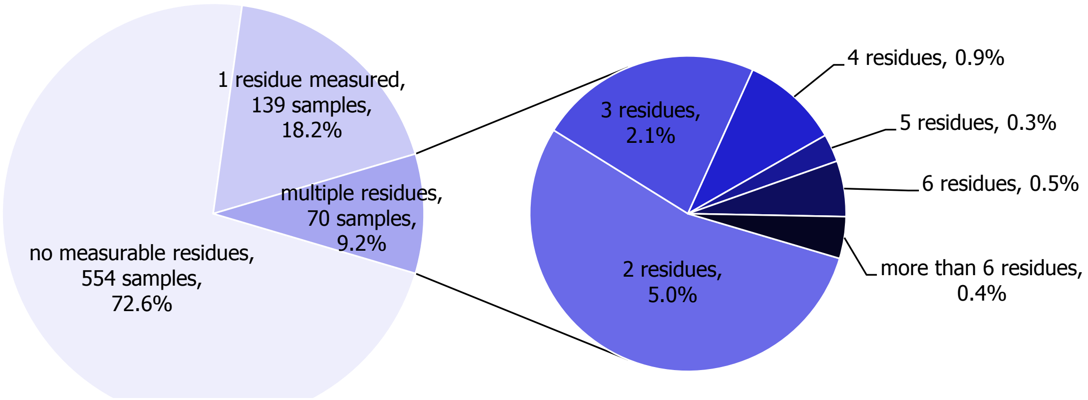


Figure 27: Number of detectable residues in individual rice samples (results for unprocessed rice grain and polished rice were pooled)

In 2.1% of the samples (16 samples), the residue concentrations exceeded the MRLs; all the MRL exceedances are related to unpolished rice. 1.2% of the samples (9 samples) were reported as non-compliant, taking into account the measurement uncertainty. The MRL exceedances were mainly related to imported products (14 samples).

In total, 39 different pesticides were detected. The most frequently found pesticides were pirimiphos-methyl (detected in 7.8% of the tested samples), bromide ion (7.5%) and deltamethrin (6.9%). The MRL was exceeded for 9 different pesticides, most frequently for carbendazim (RD) (8 samples, 4 from India, 1 from Vietnam, 1 from Pakistan, 1 from Italy and 1 unknown origin), triazophos (5 samples from which 4 were from India and 1 from Italy) and methamidophos (4 samples; 3 from India and 1 from South Korea).

Figure 28 depicts the results for all pesticides with MRL exceedances and all detected pesticides with residues below or at the MRL. Compared to 2011, the pesticide spectrum was comparable, with a reduced detection and MRL exceedance rate for bromide ion. MRL exceedances were noted for non-approved pesticides (i.e. triazophos, methamidophos, acephate, profenofos, hexaconazole and phenthoate).

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 29. Further information on the most frequently detected pesticides found in rice in 2014 in at least 5% of the samples is compiled in Table 9.

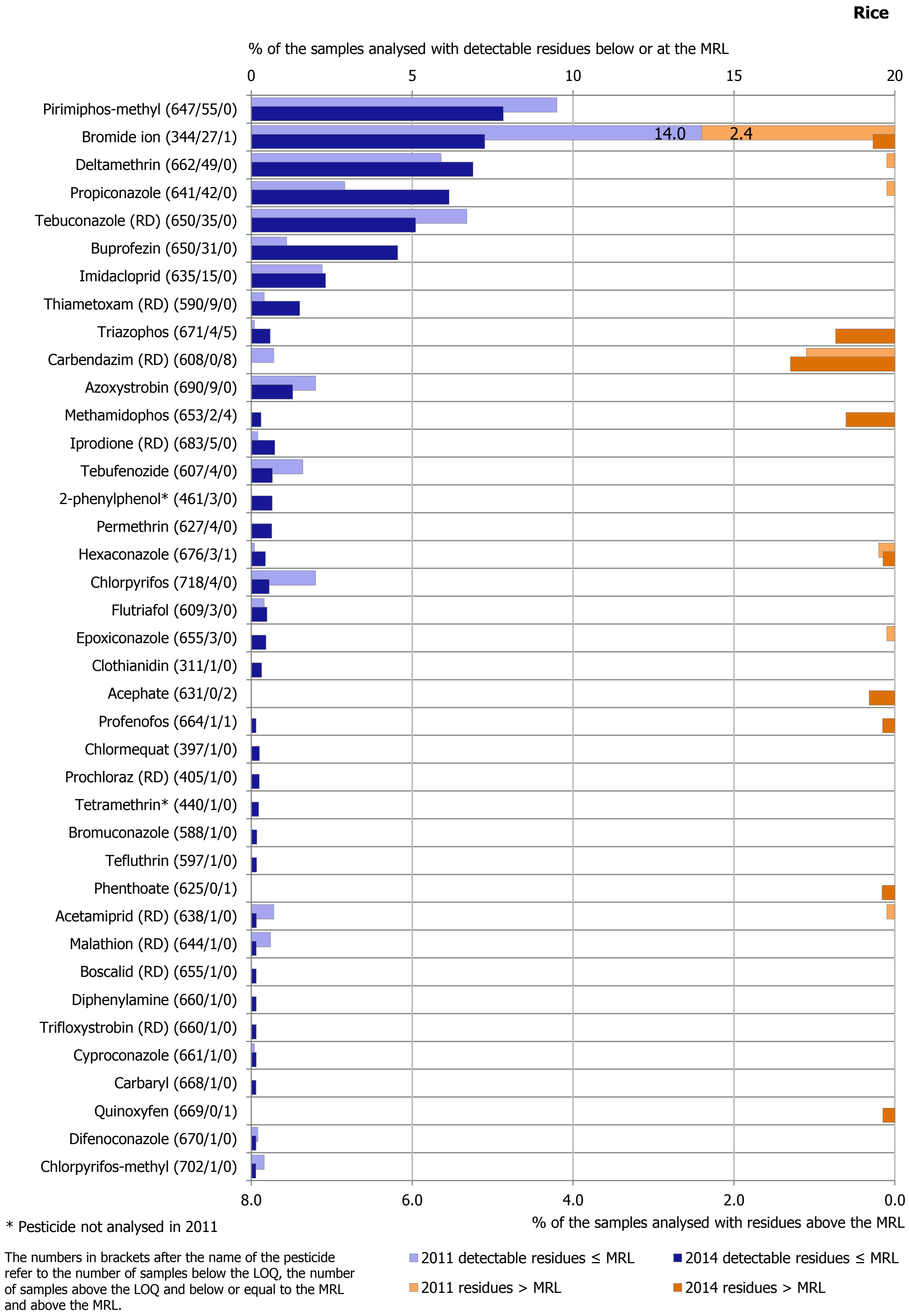


Figure 28: Percentage of rice samples with detectable residues below or equal to the MRL and with residues above the MRL

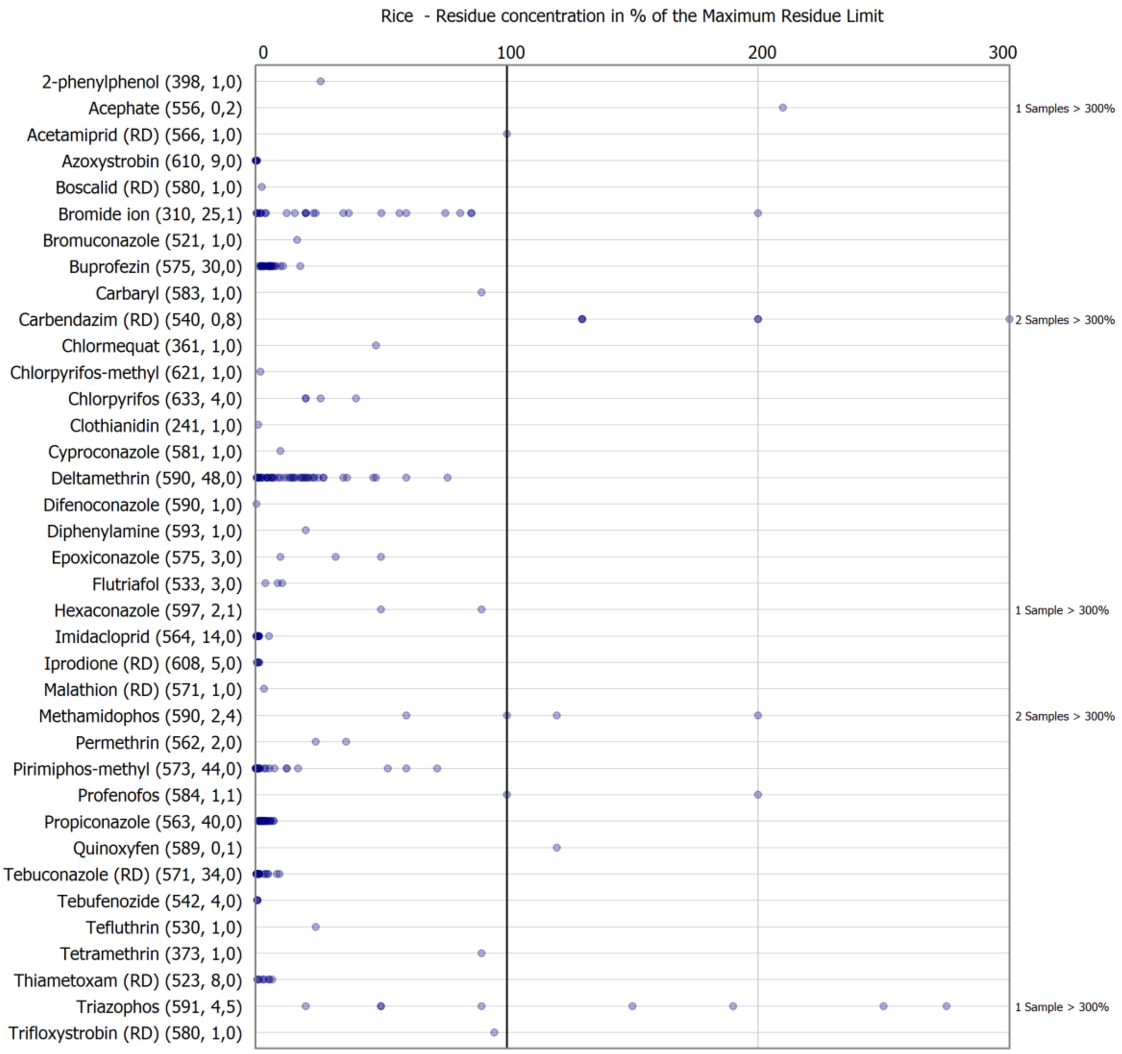


Figure 29: Residue concentrations measured in rice, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 9: Pesticides most frequently detected in rice in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Pirimiphos-methyl	7.8	Approved insecticide, used also for post-harvest treatment
Bromide ion	7.5	Methyl bromide is used as a fumigant, leading to residues of bromide ion. Bromide ion is also naturally occurring in low concentrations in untreated products.
Deltamethrin	6.9	Approved insecticide
Propiconazole	6.1	Approved fungicide
Tebuconazole (RD)	5.1	Approved fungicide

3.3.10. Wheat flour

According to the 2014 EU monitoring regulation, Member States had to take samples of wheat flour. This regulation did not specify the type of flour (wholemeal flour or refined white flour). In 2014, 702 samples of wheat flour were analysed; 639 of these samples were refined white flour whereas 63 samples of wholemeal flour were analysed. In 413 samples (58.8%), no pesticide residues were detected, while 289 samples (41.2%) contained one or several pesticides in measurable concentrations. Multiple residues were reported in 83 samples (11.8%); up to 4 different pesticides were detected in an individual wheat flour sample (Figure 30). Compared to 2011, the overall detection rate decreased (2011 samples: 52.1% contained pesticide residues).

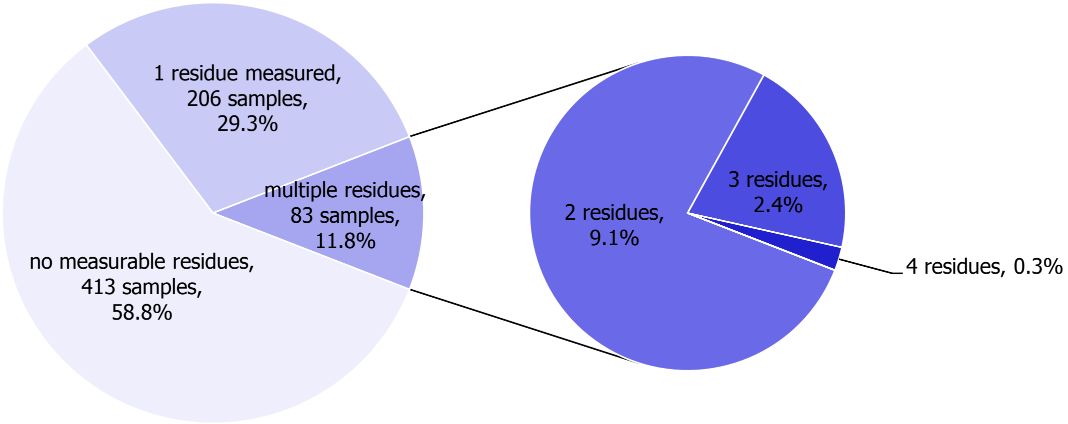


Figure 30: Number of detectable residues in individual wheat flour samples (results for white flour and wholemeal flour were pooled)

For 0.4% of the samples (3 samples) reporting countries considered the residue concentrations measured as exceeding the legal limits.

In total, 19 different pesticides were detected. Figure 31 depicts the results for all pesticides with MRL exceedances and all detected pesticides with residues below or at the MRL. The most frequently found pesticides were chlormequat (detected in 47.7% of the tested samples) and pirimiphos-methyl (17.7%). MRL exceedances were found for 2 different pesticides,[28] i.e. for permethrin (2 samples from Poland) and cyfluthrin (1 sample from Portugal) while no such events were identified in 2011. All the MRL exceedances were related to refined white flour. The detection rate for pirimiphos-methyl, chlorpyrifos-methyl, deltamethrin and chlorpropham (RD) has decreased in 2014 compared to 2011.

For processed commodities, a direct comparison of the measured residue and the legal limit set for the unprocessed products is not appropriate. In order to decide whether a processed product is compliant with the legal provision, a processing factor should be taken into account, which quantifies the transfer of pesticide residues from unprocessed to processed products. In accordance with the legal provisions in the past, data to derive processing factors had to be provided by applicants requesting the approval of active substances only in cases where a significant consumer exposure was expected. Thus, a complete list of processing factors is currently not available. For this reason, EFSA did not prepare the dot-plot presenting the measured residue concentration as percentage of the legal limit. Further information on the most frequently detected pesticides found in wheat flour in 2014 in at least 5% of the samples is compiled in Table 10.

[28] The measured residues were 0.041 mg/kg of cyfluthrin (RD) and 0.266 mg/kg and 0.0196 mg/kg of permethrin. The MRL for unprocessed wheat is set at the LOQ for both pesticides (0.02 mg/kg for cyfluthrin (RD) and 0.05 mg/kg for permethrin). Considering that the legal limtis were at the LOQ, the presence of residues above the LOQ was considered as sufficient evidence for MRL exceedance.

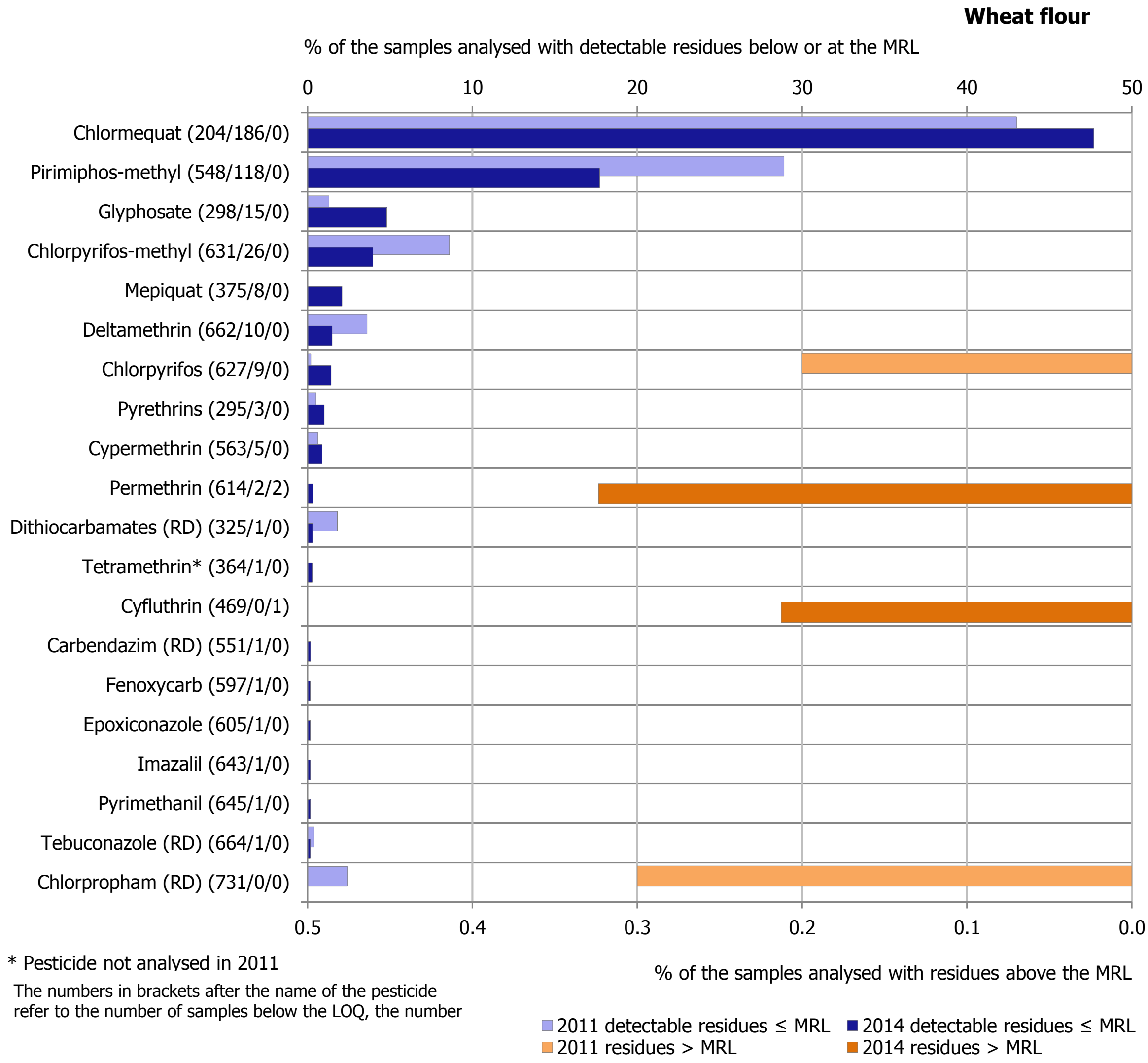


Figure 31: Percentage of wheat flour samples with detectable residues below or equal to the MRL and with residues above the MRL

Table 10: Pesticides most frequently detected in wheat flour in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Chlormequat	47.7	Approved plant growth regulator
Pirimiphos-methyl	17.7	Approved insecticide, used also for post-harvest treatment

3.3.11. Liver (bovine, poultry, sheep, swine)

In 2014, 1,141 liver samples of different species were analysed (307 samples of bovine liver, 386 samples of poultry liver, 84 samples of sheep liver and 364 samples of swine liver). For the data analysis, the results of all liver samples were pooled. In 1,120 samples (98.2%), no pesticide residues were detected, while 21 samples (1.8%) contained one or several pesticides in measurable concentrations. Only 1 sample (0.1%) contained multiple residues (2 different pesticides) (Figure 32). Compared to 2011, the overall detection rate decreased (2011: 3.6% of the samples contained pesticide residues).

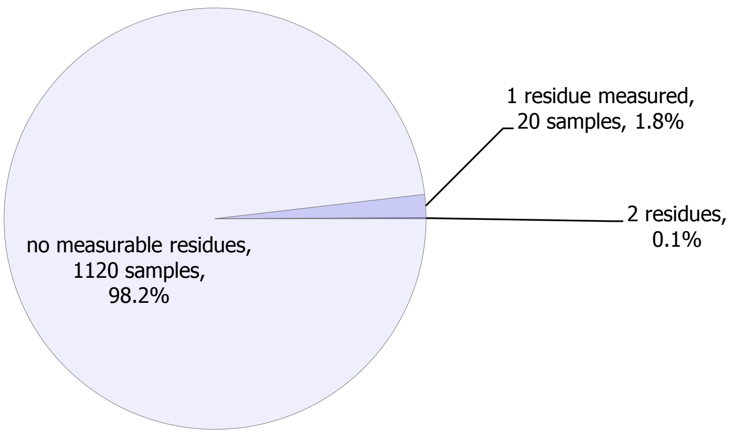


Figure 32: Number of detectable residues in individual liver samples (results for different animal species were pooled)

No MRL exceedance was reported for any liver sample analysed. In total, 5 different pesticides were detected. The most frequently found pesticide was hexachlorobenzene, an active substance that is no longer used as a pesticide but is still present in the environment due to its environmental persistence (detected in 1.3% of the tested samples); in a low percentage of samples, other persistent organic pollutants such as DDT and chlorobenzilate were detected. Pendimethalin is the only approved pesticide detected in liver.

Figure 33 depicts the results for all the detected pesticides with residues below or at the MRL. Compared to 2011, the pesticide profile did not change significantly.

The individual residue concentrations, expressed as a percentage of the respective MRL for the pesticide are plotted in Figure 34. Further information on the detected pesticides found in liver in 2014 is compiled in Table 11.

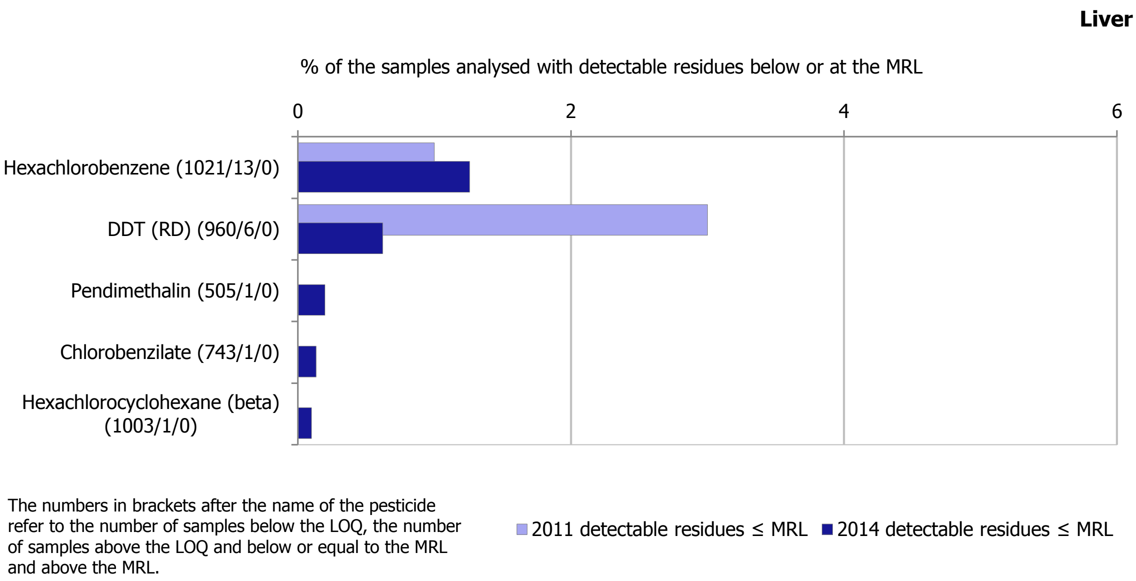


Figure 33: Percentage of liver samples with detectable residues below or equal to the MRL (no samples with residues above the MRL)

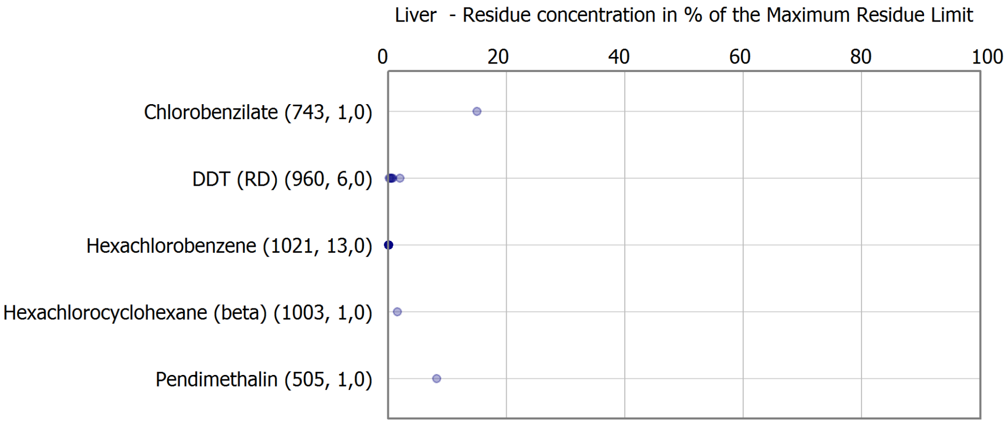


Figure 34: Residue concentrations measured in liver, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 11: Pesticides most frequently detected in liver in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
Hexachlorobenzene	1.3	Banned pesticide, detected in bovine liver
DDT (RD)	0.6	Banned pesticide, detected in bovine and sheep liver
Pendimethalin	0.2	Approved herbicide, detected in bovine liver
Chlorobenzilate	0.1	Not approved acaricide, detected in swine liver
Hexachlorocyclohexane (beta)	0.1	Not approved insecticide, detected in bovine liver

3.3.12. Poultry (muscle and fat)

According to the 2014 EU monitoring regulation, Member States had to take samples of poultry meat. However, with the entry into force of the new food classification (Regulation (EU) No 212/2013), poultry meat was replaced by poultry muscle. Thus, in 2014 the MRLs set in the EU MRL legislation referred to poultry muscle (free of trimmable fat) and to poultry fat separately. Hence, results for poultry muscle and poultry fat were provided in accordance with the legal provisions in place in 2014. For this reason a direct comparison of the 2014 results with the results of 2011, where poultry meat was analysed, is not possible.

In 2014, 1,046 samples of poultry muscle were analysed; in addition, results for 434 samples of poultry fat were submitted by reporting countries. In Figure 35 the results for the pooled 1,480 samples of poultry muscle and fat are presented without distinction of the different matrices analysed. In 1,443 samples (97.5%), no pesticide residue was detected, while 37 samples contained one or several pesticides in measurable concentrations. Multiple residues were reported in 12 samples of poultry muscle and in 2 samples of poultry fat (0.9% of samples of poultry fat and muscle); up to 4 different pesticides were detected in an individual poultry muscle sample. In none of the samples, the MRL set for muscle or fat was exceeded.

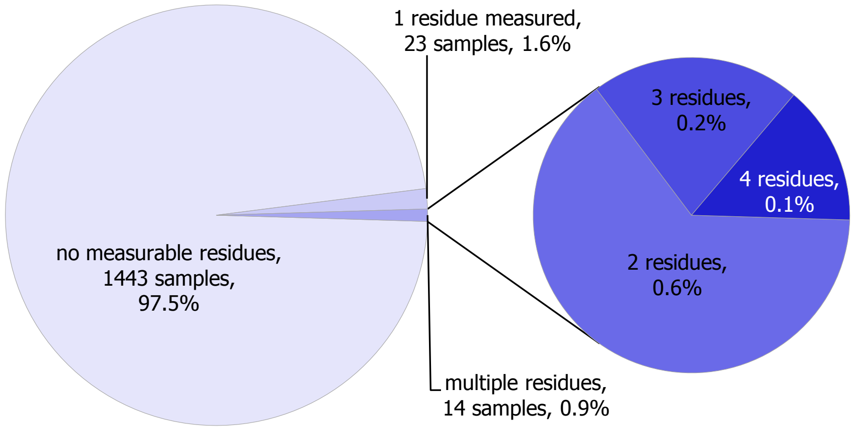


Figure 35: Number of detectable residues in individual poultry muscle and poultry fat (results for the two matrices were pooled)

In total, 8 different pesticides were detected with DDT being the most frequent (detected in 1.9% of the tested samples) followed by chlordane (RD) (1.1%).

Figure 36 depicts the results for all pesticides detected with residues below or at the MRL. The individual residue concentrations, expressed as a percentage of the respective MRL in poultry muscle and poultry fat are plotted in Figure 37. Further information on the most frequently detected pesticides found in poultry meat in 2014 in at least 1% of the samples is compiled in Table 12.

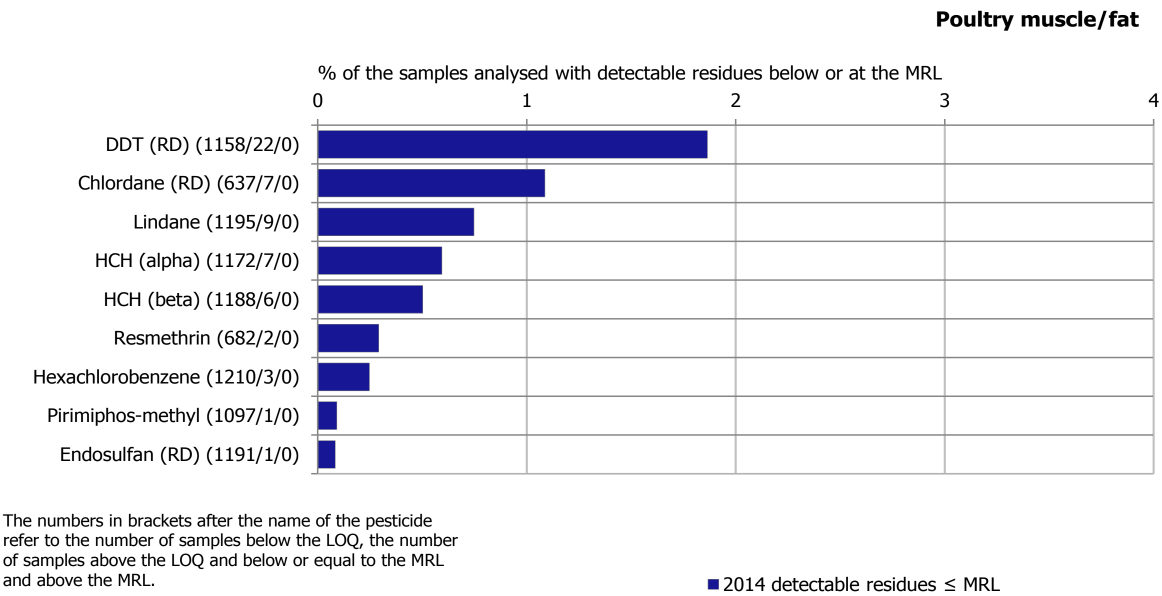


Figure 36: Percentage of poultry samples (muscle or fat) with detectable residues below or equal to the MRL and with residues above the MRL

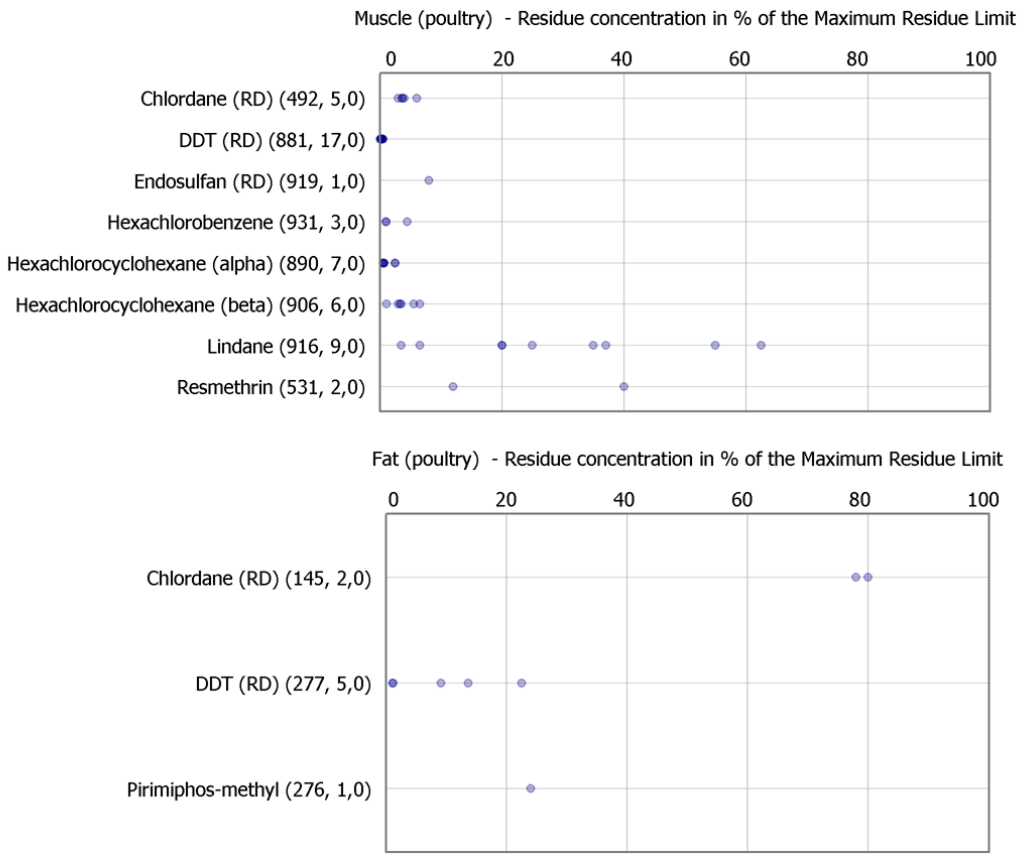


Figure 37: Residue concentrations measured in poultry samples, expressed as a percentage of the MRL (only samples with residues > LOQ)

Table 12: Pesticides most frequently detected in poultry muscle/fat in 2014

Pesticide	% samples above LOQ	Further information on the pesticides found
DDT (RD)	1.9	Banned pesticide
Chlordane (RD)	1.1	Banned pesticide

3.4. Overall results of EU-coordinated monitoring programme

Overall, 1.5% of the 12,850 samples analysed in 2014 in the framework of the EU-coordinated monitoring programme exceeded the MRL (192 samples). Taking into account the measurement uncertainty, 0.8% of the samples (104 samples) were considered to be not compliant while the remaining samples exceeded the MRL numerically but did not lead to legal or administrative follow-up actions. The number of samples with measurable residues above the reporting limit, but within the legally permitted level (above the LOQ but below the MRL) was 4,935 (38.4%) (see Figure 38). The number of samples with no quantifiable residues (residues below the limit of quantification) was 7,723 (60.1%).

Compared with 2011, the reference period where the same commodities as in 2014 were analysed, the MRL exceedance rate has slightly declined in 2014 (1.5% in 2014; 1.9% of the samples analysed in 2011 in the framework of the EUCP exceeded the legal limit in place). The percentage of samples with quantifiable residues within the legal limits was lower in 2014 (43.3% in 2011 versus 38.4% in 2014).

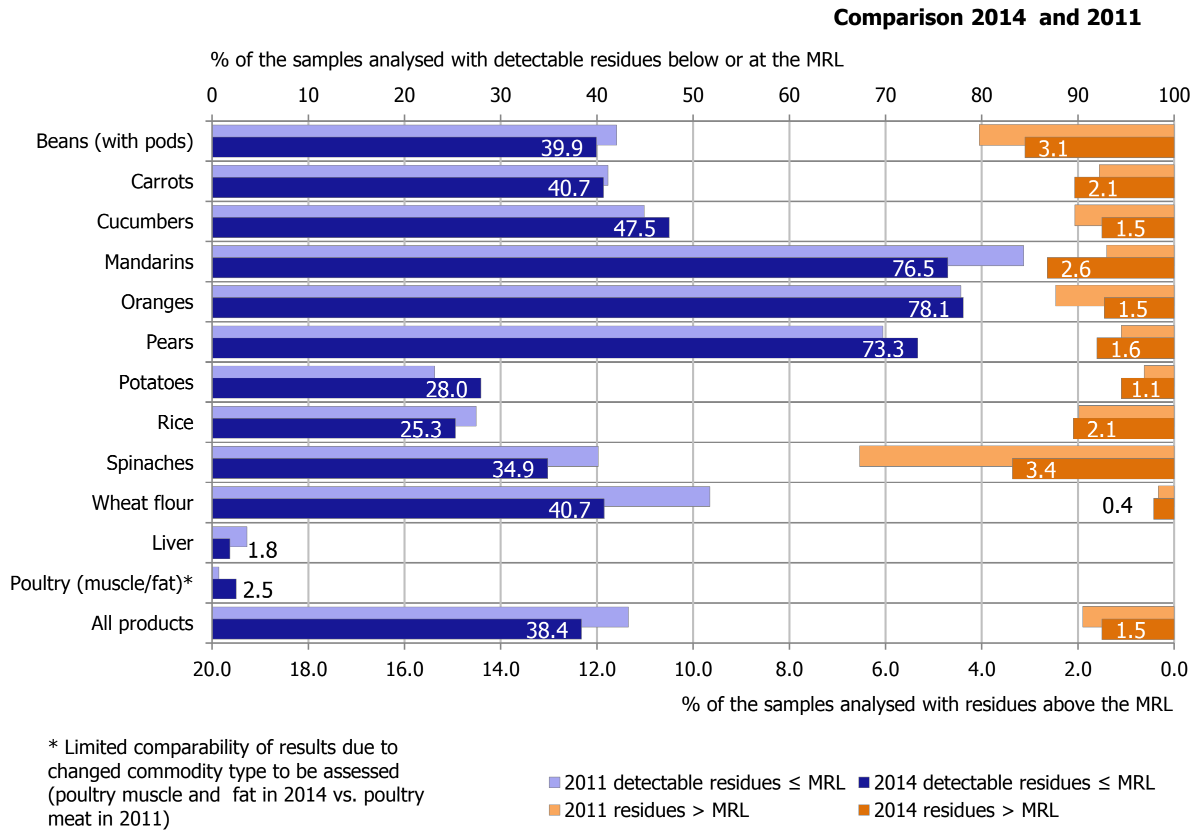


Figure 38: Overall proportion of EUCP samples with residues exceeding the MRL and samples with quantifiable residues below the MRL

Among the unprocessed plant products analysed in the 2014 EU-coordinated control programme, the lowest MRL exceedance rate was identified in potatoes, followed by oranges and cucumbers. The ascending ranking of plant products exceeding the MRL is continued with pears, carrots, rice, mandarins, beans (with pods) and spinaches. A low MRL exceedance rate was also found for wheat flour. No MRL exceedance was identified in animal products (liver, poultry muscle/fat).

4. National control programmes

Compared with the EU-coordinated monitoring programme, the national control programmes are rather risk based, focussing on products which are likely to contain pesticide residues or for which MRL infringements were identified in previous monitoring programmes. These programmes are not designed to provide statistically representative results for residues expected in food placed on the European market. The reporting countries define the priorities for their national control programmes taking into account the importance of food products in trade or in the national diets, the products with high residue prevalence or non-compliance rates in previous years, the use pattern of pesticides and the laboratory capacities. The number of samples and/or the number of pesticides analysed by the participating countries is determined by the capacities of national control laboratories and the available budget resources. Considering the specific needs in the reporting countries and the particularities of national control programmes, the results of national control programmes are not directly comparable.

In the framework of the national control programmes, reporting countries also provided the results of import controls as required by Regulation (EC) No 669/2009. These specific import controls are defined based on previously observed high incidences of non-compliant products imported from certain countries and/or notifications under the Rapid Alert System of the European Commission.

The first part of this chapter (Section 4.1) describes the design of the national programmes highlighting the differences in the approaches chosen by reporting countries. In the second part of the chapter (Section 4.2), the results of the national control activities are analysed in detail with regard to the main parameters describing the national programmes (food products/pesticides/countries of origin). In these analyses, EFSA put specific emphasis on MRL exceedances as these findings may give indications of agricultural practices not in line with the legal provisions or potential consumer risk. However, it should be stressed again that since the national control programmes are targeted sampling strategies, the identified cases of MRL exceedances should not be considered as being statistically representative of the food available to European consumers. The findings, in particular the MRL exceedances, should be used by risk managers to take decisions how to design the risk based national monitoring programmes, e.g. which pesticides should be covered by the analytical methods used to analyse food products, or which types of products should be included in the national control programmes in order to make the programmes more efficient.

4.1. Description of the national control programmes

In 2014, in total 82,649 samples[29] of food products covered by Regulation (EC) No 396/2005 were analysed for pesticide residues in the reporting countries. Thus, the total number of samples analysed under the national control programmes increased slightly compared with the previous reporting year (+ 2.1%), where results for 80,967 samples were reported. The increased number of samples is partially attributed to the results submitted by Croatia, contributing to the report for the first time (376 samples) and to an increased number of samples analysed by some of the reporting countries compared with 2013 (+39.4% samples analysed in Luxemburg, +35.95% in the Czech Republic, +21.7% in Latvia, +21.3% in Portugal, +20.9% in Hungary, +17.6% in Cyprus and +10.8% in Germany).

The majority of samples (74,890 samples, 90.6%) were classified as surveillance samples, meaning that the samples were taken without targeting specific growers/producers/importers or consignments likely to be non-compliant. Samples that were targeted towards products or countries where higher MRL non-compliance rates were identified in the past but without specific suspect also fall in the category of surveillance samples. In 9.4% of the cases, a suspect sampling strategy was applied, enforcing provisions of EU legislation on increased level of official controls on imported food (Regulation (EC) No 669/2009). This means that samples were taking after concrete indications that certain food may be of higher risk as regards non-compliance or consumer safety (e.g. Rapid Alert notifications or follow-up enforcement samples following MRL violations identified in a first analysis of the product in focus).

The number of samples per reporting country and the sampling frequency per 100,000 inhabitants of the reporting country are illustrated in Figure 39 and Figure 40.

No major changes were noticed in the national control programmes of 2013 and 2014 as regards the ratio of samples from domestic production, other EU/EEA countries and third countries (EFSA, 2015c); the information on the sample origin for the 2014 programme is presented in Figure 41. The countries with the highest rates of samples of imported products are Bulgaria (87.7%), the Netherlands (65.9%) and Lithuania (49.7%); Greece, Italy, Spain, Portugal and Hungary focussed their national control programmes mainly on domestic products (more than 70% of the samples analysed).

[29] In addition to these 82,649 samples, the results for 586 samples of feed and fish were reported to EFSA. However, since for these two food groups currently no legal limits are set under Regulation (EC) No 396/2005, these samples are not further taken into account for the detailed analysis.

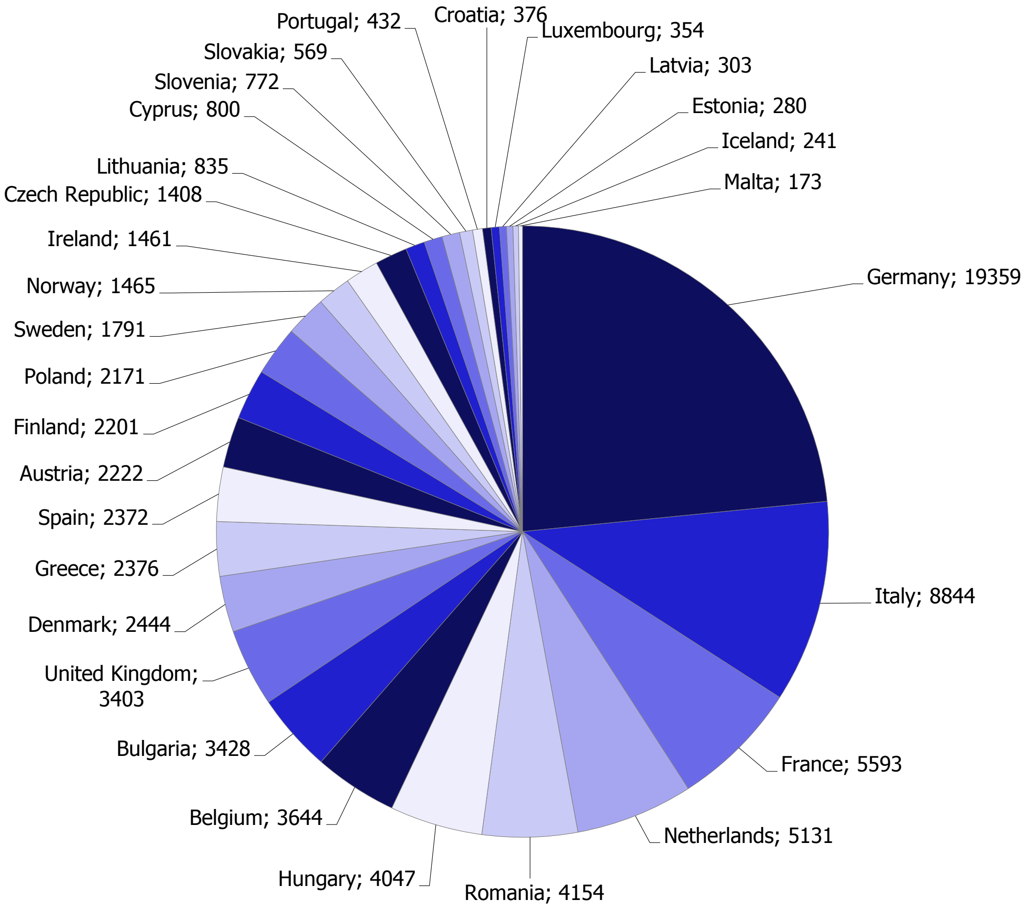


Figure 39: Number of samples analysed by each reporting country

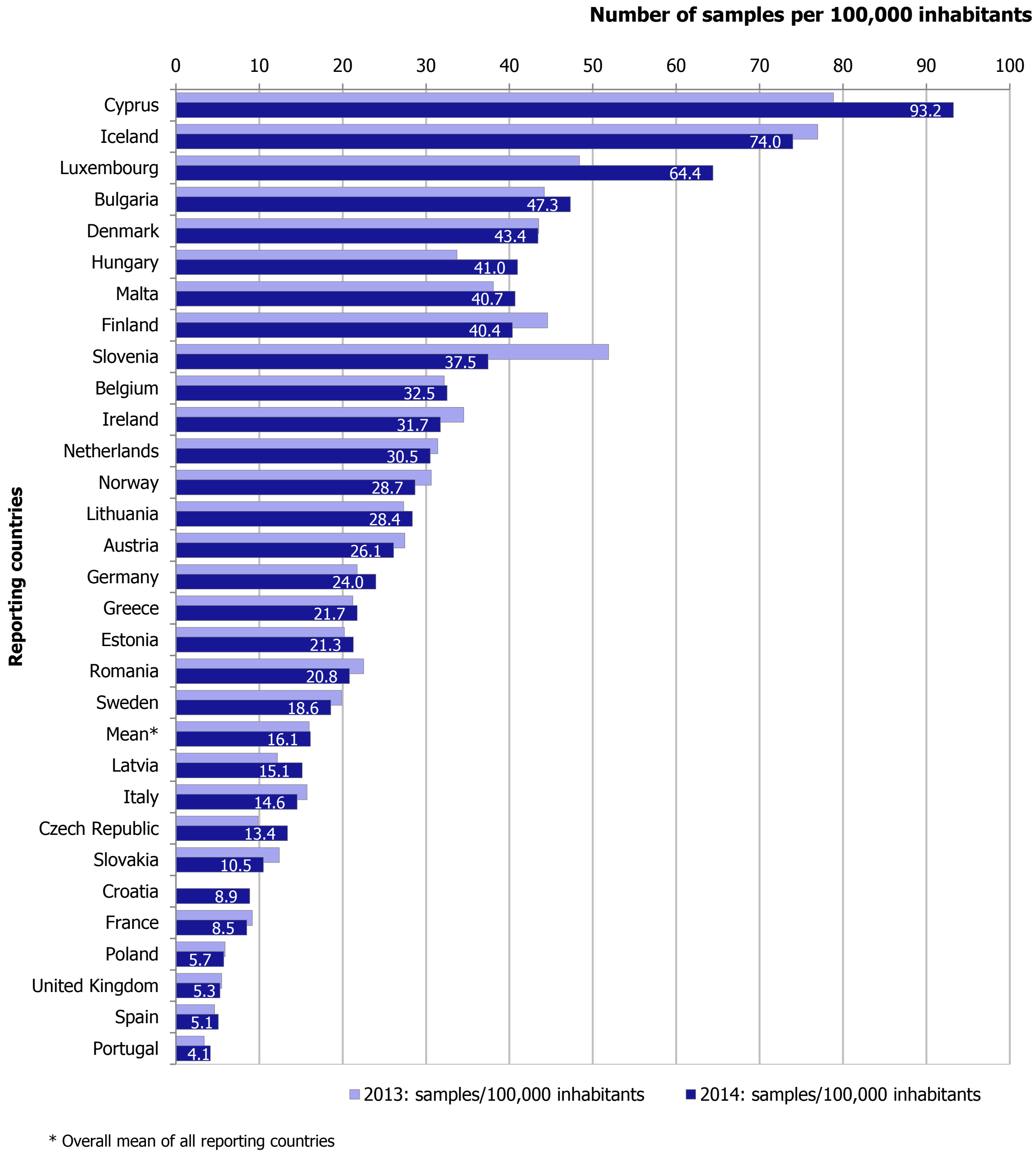


Figure 40: Number of samples normalised by number of inhabitants

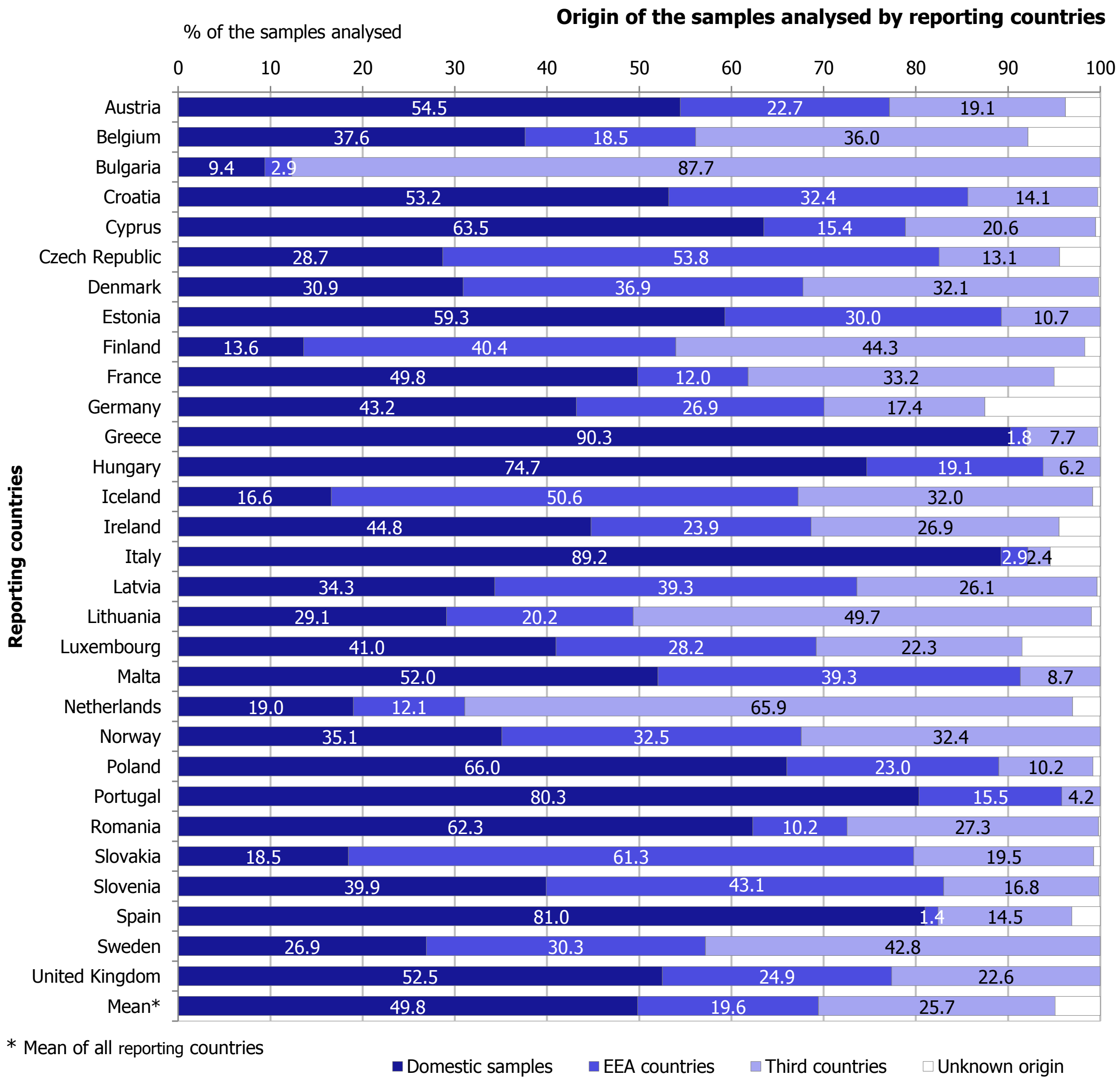


Figure 41: Origin of samples by reporting country

A more detailed analysis of the origin of the samples is presented in Figure 42. Overall, 57,399 samples analysed originated from EU and EEA countries (69.4%). 21,219 samples (25.7%) concerned products imported from third countries; for 4,031 samples (4.9%) the origin of the products was not reported. Approximately one quarter of the samples from third countries, (6,497 samples) were taken for products subject to an increased level of official controls under Regulation (EC) No 669/2010 (see Section 4.2.4).

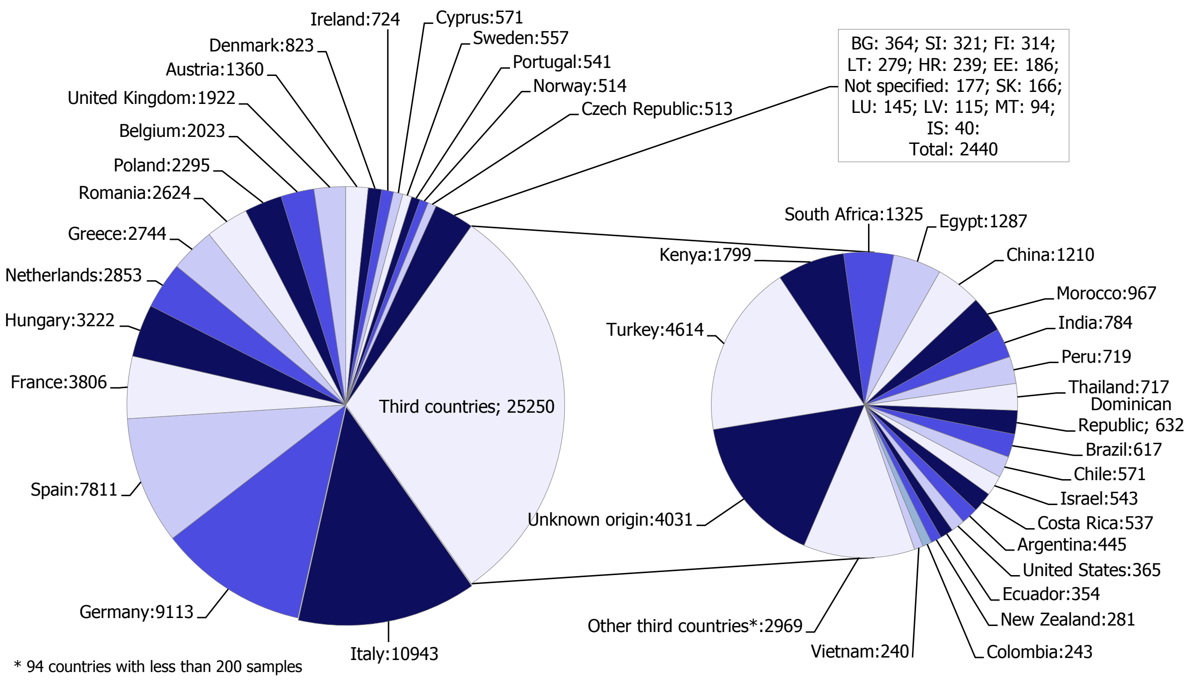


Figure 42: Origin of samples (reporting countries and third countries)

Typically, national control programmes show a wide diversity regarding the number of pesticides analysed (analytical scope; see also Appendix C, Table 18) and the number of different food products analysed. Overall, the reporting countries analysed samples taken in the framework of the national control programmes for 778 different pesticides. The broadest analytical scopes were noted for the German control laboratories which covered 683 pesticides, followed by Belgium (548 pesticides), the Netherlands (534 pesticides), Spain (507 pesticides), Austria, Luxembourg and the United Kingdom (all analysed for more than 400 distinct pesticides). On average, in the framework of the national control programmes, samples were analysed for 212 different pesticides, which is an increase by 6% compared to the previous year; Ireland, Luxembourg, Sweden, Belgium, Germany, France, Norway and the Netherlands analysed on average for more than 250 pesticides per sample. The complete picture regarding the number of pesticides analysed under the national control programmes can be found in Figure 43.

All reporting countries together covered in total 226 unprocessed agricultural food products and a wide variety of different processed products derived from 139 agricultural products (e.g. cereal products such as flour, or polished rice, wine, vegetable oils, fruit and vegetable juices, canned fruits and vegetables, milk products, dried fruits such as raisins, dried herbs, etc.).

A detailed analysis of the national control programmes reveals the different scopes of the national MRL enforcement strategies. Additional elements, such as the proportion of organic and conventional product samples as well as the types of food products sampled (e.g. products which are more likely to exceed the legal limits, such as certain fruits and vegetables, or the proportion of products with a lower probability of MRL exceedance, such as animal products and cereals), contribute to the overall variability of the national control programmes. The heterogeneity of national control programmes needs to be borne in mind for the analysis of the results. More information on the national control programmes can be found in a technical report (EFSA, 2016f).

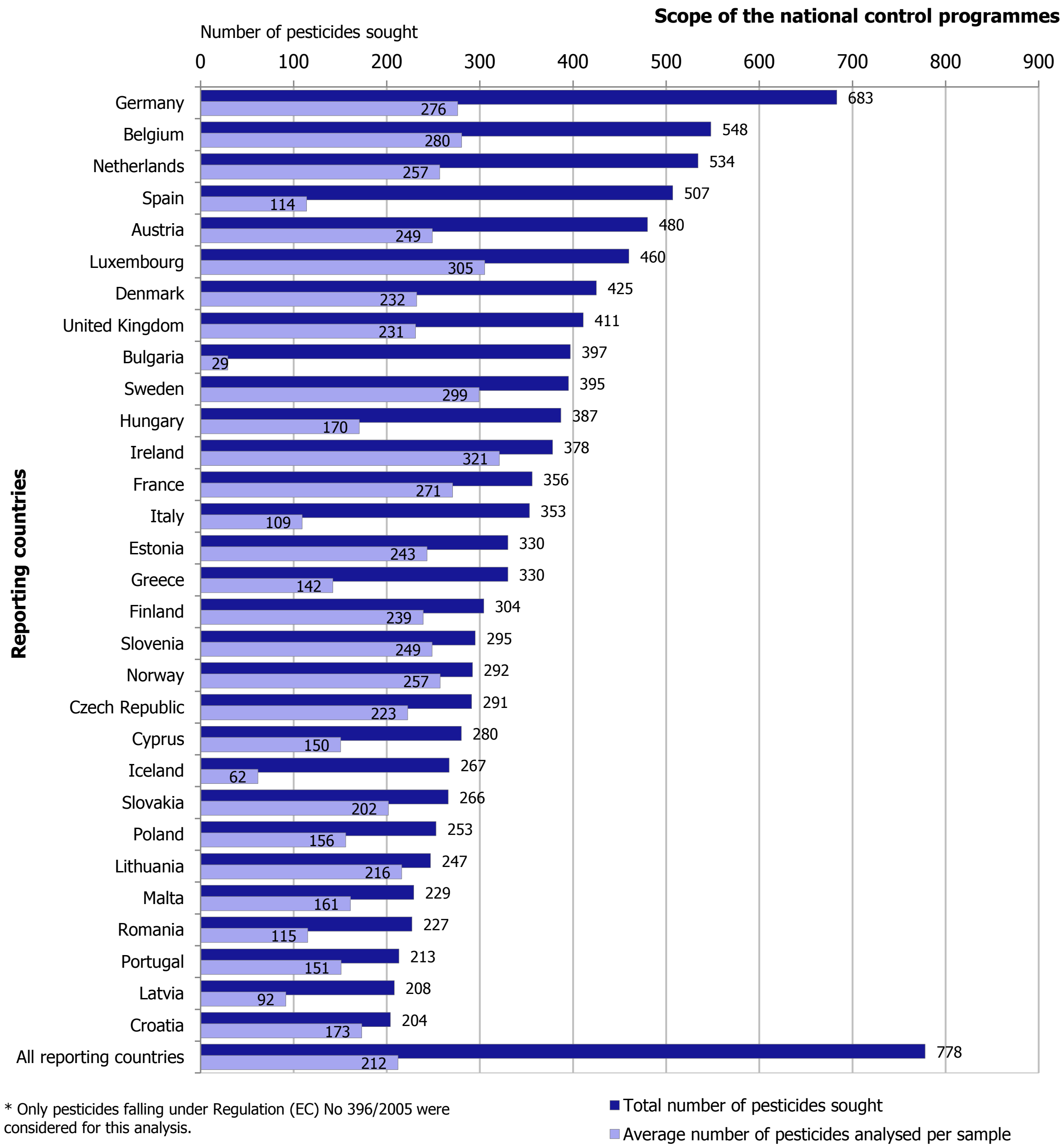


Figure 43: Analytical scope (number of pesticides analysed) by reporting countries

4.2. Results of the national control programmes

Overall, 97.1% of the 82,649 samples analysed in 2014 fell within the legal limits (80,228 samples); 44,333 of these samples (53.6% of the total number of samples tested) did not contain quantifiable residues (results for all pesticides analysed were below the LOQ) while 43.4% of the samples analysed contained measurable residues not exceeding the legal limits (35,895 samples). MRLs were exceeded in 2.9% of the samples analysed in 2014 (2,421 samples; Figure 44). For a subset of these samples exceeding the MRL values numerically (1,341 samples, 1.6% of all samples analysed in 2014), a breach of the legal limit was identified, taking into account the measurement uncertainty, triggering legal sanctions or administrative actions; these samples are considered as non-compliant with the legal limits.

Considering only surveillance samples (samples taken without targeting towards samples which are expected to be non-compliant), 2.4% of the samples analysed in 2014 contained residues exceeding the limits set in the MRL legislation; for enforcement samples the MRL exceedance rate was 7.9%.

The overall MRL exceedance and non-compliance rates in 2014 were slightly higher compared with 2013, where 2.6% of the samples exceeded the legal limits numerically and 1.5% of the samples were non-compliant. In Figure 44, the overall results for 2014 together with a separate presentation of the results for enforcement and surveillance samples are presented. In addition, a comparison with the results of 2013 was included.

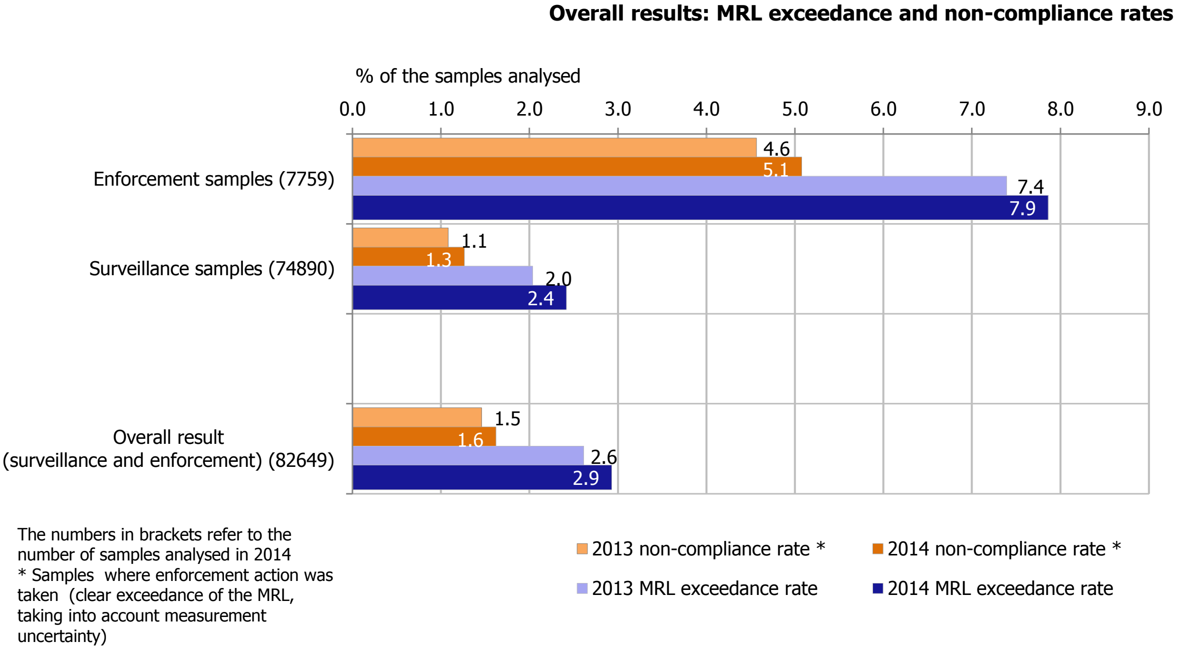


Figure 44: Percentage of samples compliant with the legal limit/exceeding the legal limit (MRL)

The results presented in the following sections refer to the complete data set, comprising results of surveillance and enforcement samples as well as unprocessed and processed food products, unless specifically indicated that the analysis was restricted to a subset of the results.

4.2.1. Results by country of food origin

Overall, 56.6% of the samples originating from EU/EEA countries were free of quantifiable residues; 41.8% of the samples contained residues above the LOQ but below the MRL, while 1.6% of the samples exceeded the legal limit. 0.8% of the samples were considered non-compliant with the legal limits, triggering legal or administrative sanctions for the responsible food business operators.

Samples from third countries were found to have a higher MRL exceedance rate and non-compliance rate compared to food produced in the EU and EEA countries (MRL exceedance rate for food produced in third countries: 6.5%; non-compliance rate: 3.9%) (Figure 45). The percentage of samples from third countries that were free of quantifiable residues (residues below the LOQ) amounted to 45.5% while 48.1% of the samples contained residues within the permitted limits.

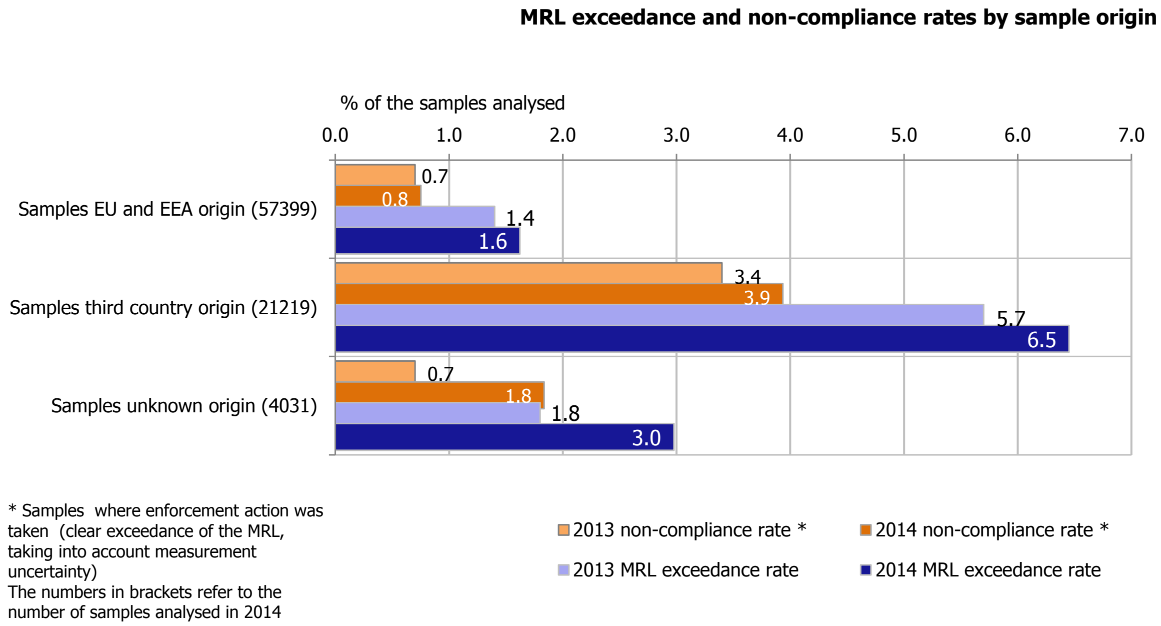


Figure 45: Percentage of samples compliant with the legal limit/exceeding the legal limit (MRL) by origin

The detailed MRL exceedance rates and the percentage of samples containing measurable residues within the legal limits originating from reporting countries and from third countries are presented in Figure 46 and Figure 47; to allow a comparison with the previous reporting year these two charts contain also the results for 2013.

The highest MRL exceedance rates among the samples originating from the reporting countries were reported for products from Malta, Cyprus, Portugal, Poland, Greece and France (>2.5% of samples exceeding the legal limit) while samples from Iceland, Ireland, Latvia, Denmark, Estonia, Croatia, Sweden, Luxembourg, Romania, Hungary and Slovenia were most frequently free of detectable residues (more than 75% of the samples).

Among the third countries with at least 60 samples analysed, the highest MRL exceedance rate was found for Vietnam, Cambodia, Uganda, Pakistan, China, the Dominican Republic, Sri Lanka, Jordan and India (all above 10%). Other third countries with a substantial number of samples (more than 60 samples) and MRL exceedances above the average were Suriname, Thailand, Kenya, Mexico and Egypt.

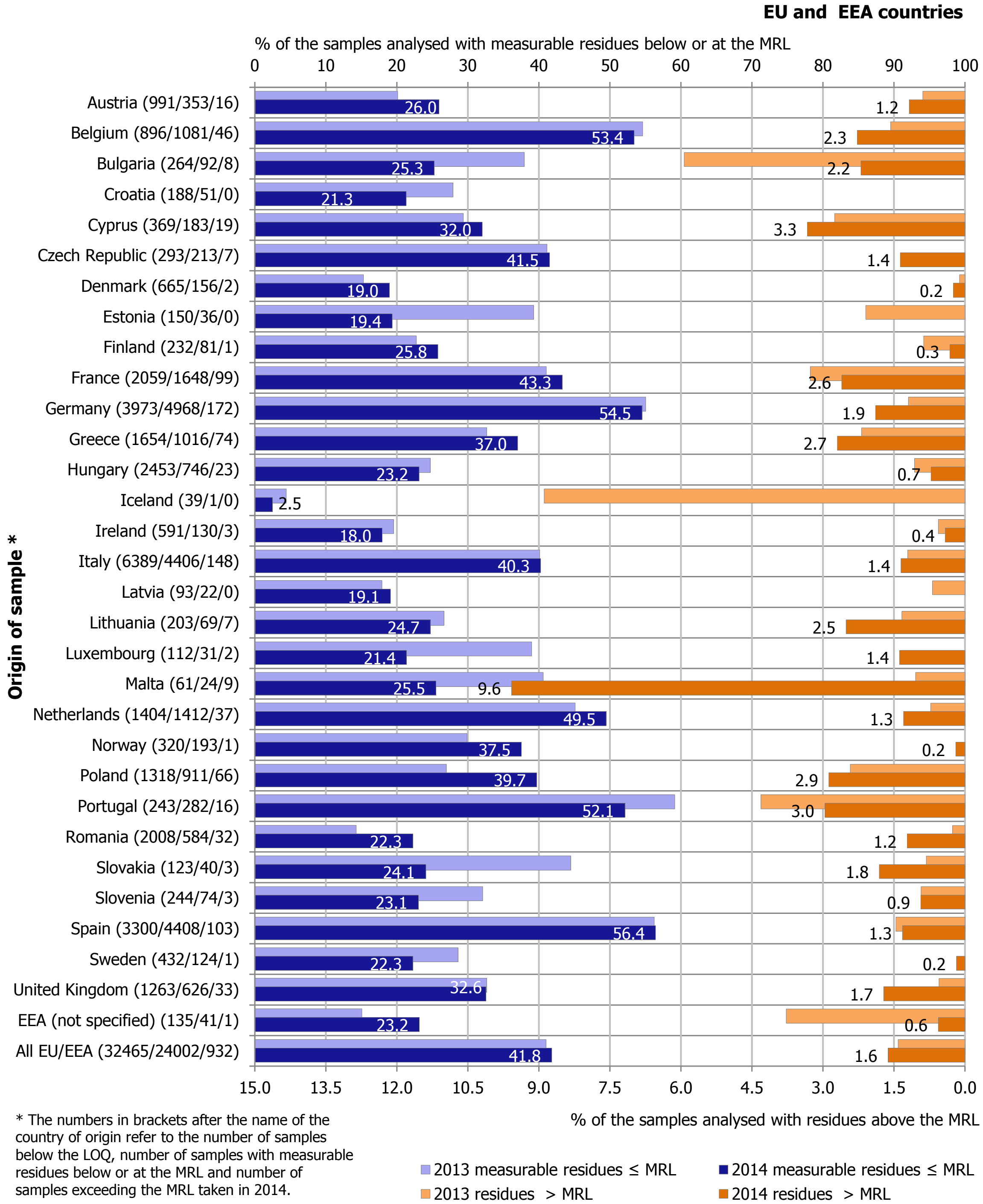


Figure 46: EU and EEA countries: MRL exceedance rate and residue detection rate by country of origin, sorted alphabetically

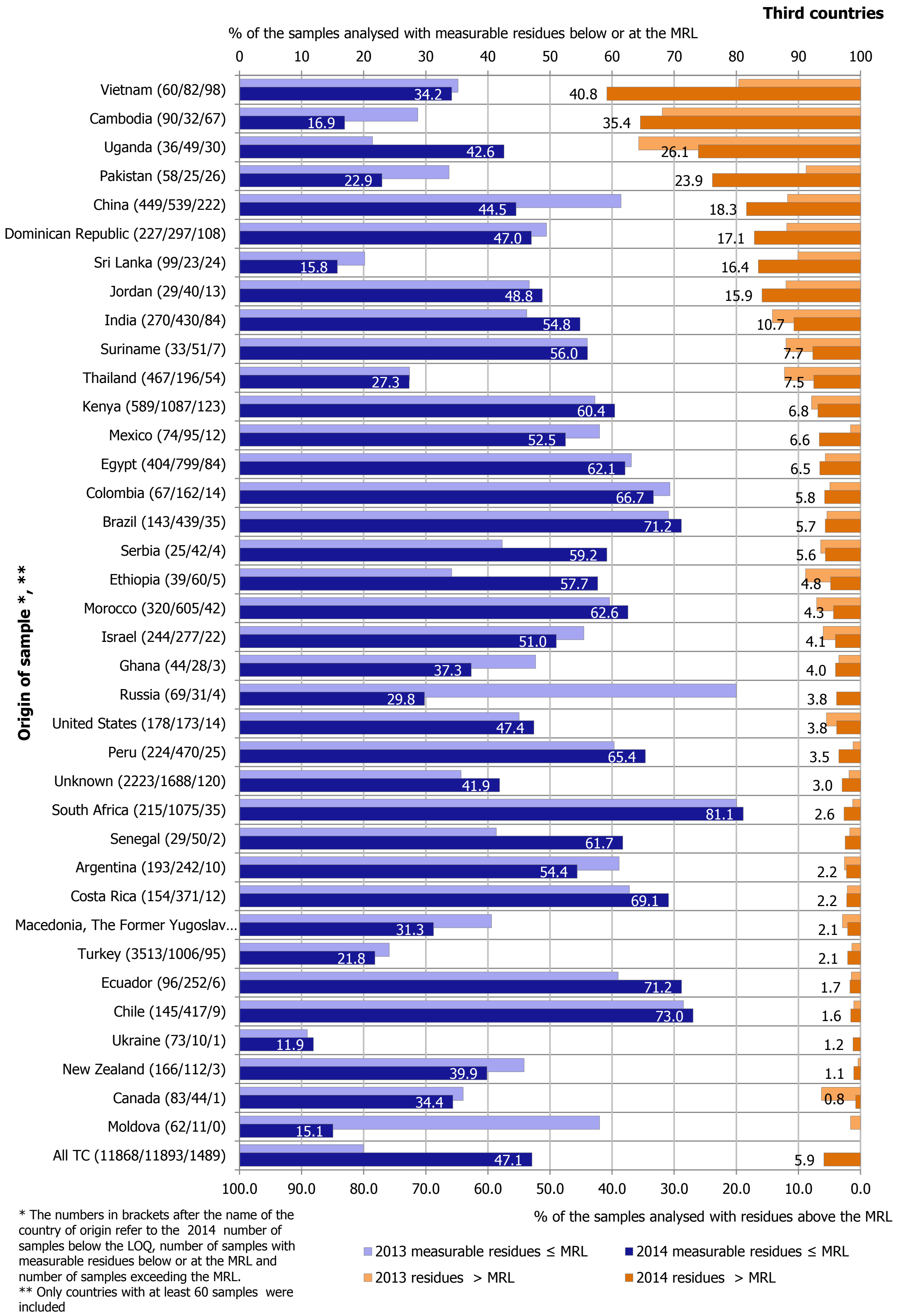


Figure 47: Third countries: MRL exceedance rate and residue detection rate by country of origin, sorted by MRL exceedance rate

4.2.2. Results by food products

The MRL exceedance rate for unprocessed products[30] amounted to 3.1% of the samples analysed; 45.7% of the samples contained measurable residues that were within the legal limits, and 51.2% of the unprocessed products were free of quantifiable residues (below the LOQ). Among the unprocessed products with at least 60 samples analysed, MRL exceedances were most frequently identified for guava, passionfruit, tea leaves, lychee, celery leaves, turnips, pomegranates, parsley, okra, blackberries, limes, basil, certain herbal infusions, bovine liver, papayas, peas (with pods), spring onions (MRL exceedance rate greater than 7%). More detailed information on the MRL exceedance rates and pesticide detection rates for unprocessed food products is presented in Figure 48. Some of the food products with MRL exceedance rates above the average are products, which were subject to increased import control under Regulation (EC) No 669/2009 (e.g. tea leaves, okra, basil, parsley, peas with pods, celery leaves). Thus, the results for these products are biased due to the targeted sampling in the framework of border inspections. More details on results for this specific sampling programme can be found in Section 4.2.4.

No MRL exceedance (products with at least 60 samples analysed) was reported for unprocessed hazelnuts, sweet corn, rhubarb, buckwheat and a number of products of animal origin such as poultry, sheep and swine liver, goat milk or poultry, swine and bovine fat.

The results for processed products are presented in Figure 49. It is noted that the overall MRL exceedance rate for processed products was lower (1.1%) compared with unprocessed products (3.1%). Processed wild fungi, tomatoes, dry beans, sweet peppers, apricots, peanuts, cattle milk, rice and table grapes were found most frequently exceeding the MRLs.

[30] Food products compliant with the description of in Annex I of Regulation (EC) No 396/2005 are considered as unprocessed products. It should be noted that this food classification comprises mainly unprocessed raw agricultural products, but also some processed products such as fermented tea, dried spices, dried herbal infusions etc.

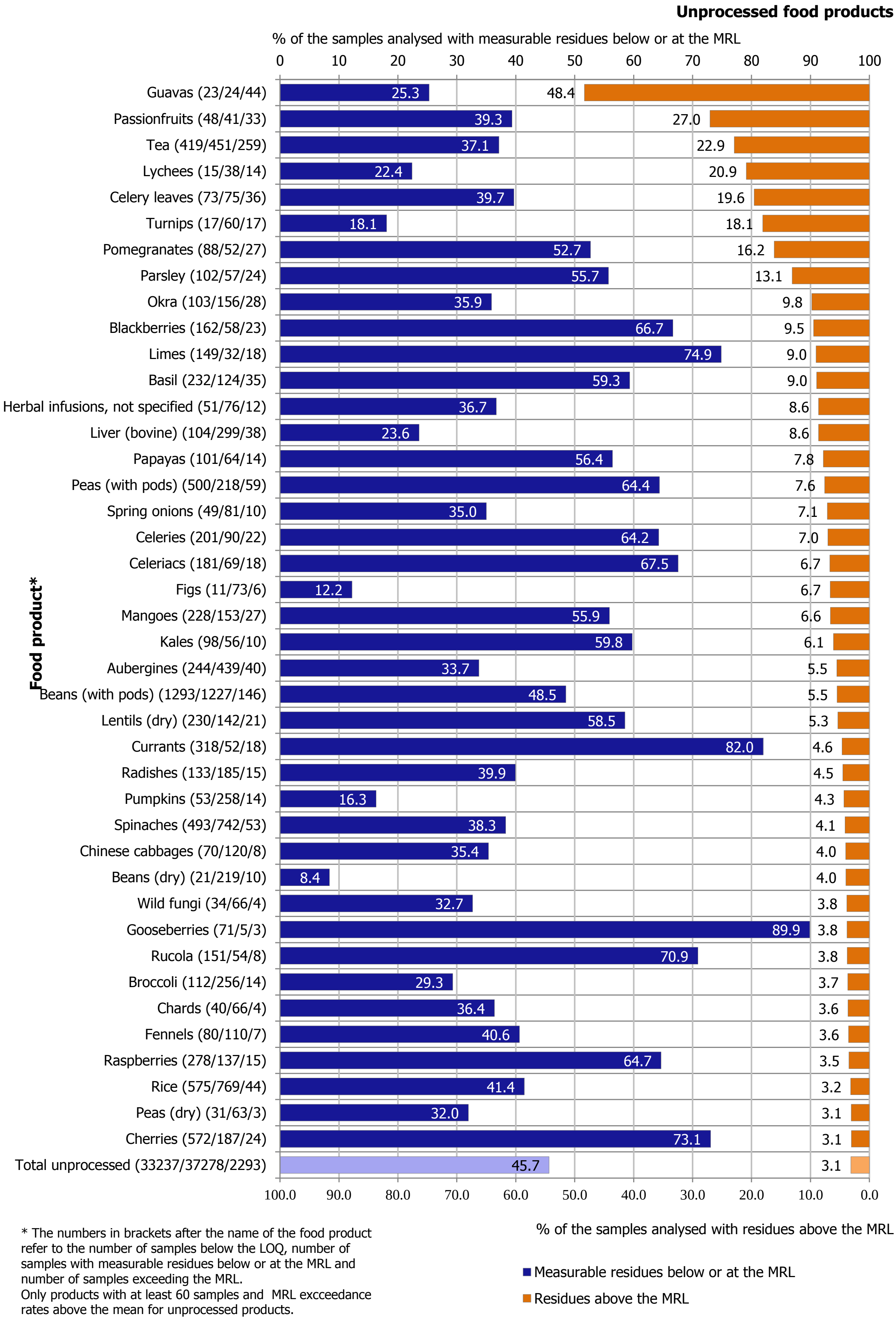


Figure 48: MRL exceedance rate and residue detection rate for unprocessed food products, sorted by MRL exceedance rate

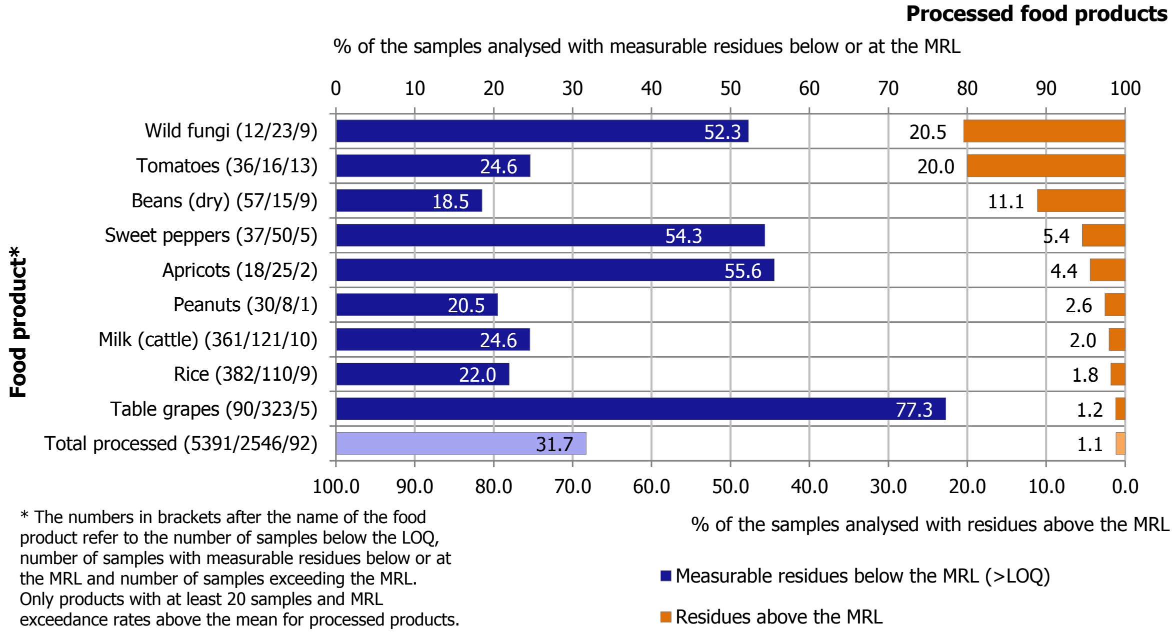


Figure 49: MRL exceedance rate and residue detection rate for processed food products (excluding baby food), sorted by MRL exceedance rate

4.2.3. Results by pesticides

Overall, 17.488,958 analytical determinations (individual results) submitted to EFSA were identified as valid results[31] and were used as the basis of the data analysis presented in this report. 101,511 of these determinations (0.58% of the valid determinations) related to 38,316 samples and 363 different pesticides were reported above the LOQ; the most frequently detected pesticides were boscalid (6,823 determinations), chlorpyrifos (4,726 determinations), imazalil (4,621 determinations), cyprodinil (3,705 determinations), azoxystrobin (3,649 determinations) and fludioxonil (3,554 determinations).

The most frequently detected pesticides in terms of detection rate (i.e. detections expressed as percentage of samples analysed for the pertinent pesticide) were copper (detected in 77% of the samples analysed for copper), fenpyrazamine (64.3%[32]), fosetyl-Al (33.2%), bromide ion (21.3%), mercury (14.1%), hydrogen phosphide (13.2%), boscalid (RD) (10.6%) and dithiocarbamates (10.5%). However, it needs to be highlighted that some of these pesticides with high detection rate were analysed only in a limited number of samples (less than 150 samples) or were analysed only by a limited number of reporting countries. A comprehensive list of the number of analysis/determinations, the number of detections per pesticide, detection rate and the number of food products analysed for the pesticide can be found in Appendix C, Table 18.

In 3,265 cases, the measured residue concentrations exceeded the legal limit (in total 2,421 samples[33]). The pesticides found most frequently violating EU MRLs are presented in Figure 50. In products produced in one of the reporting countries, at least 20 MRL violations were identified for the following pesticides: chlorpyrifos, dimethoate (RD), copper, iprodione (RD), fosetyl-Al (RD), carbendazim (RD), dithiocarbamates (RD), BAC (RD), mercury and cypermethrin.

The top ranked pesticides on products from third countries (with at least 20 MRL exceedances) are carbendazim (RD), acetamiprid (RD), chlorpyrifos, dimethoate (RD), imidacloprid, anthraquinone, hexaconazole, profenofos, cypermethrin, fipronil (RD), acephate, chlorfenapyr, triazophos, iprodione

[31] During the data cleaning step EFSA identified the subset of records that described samples covered by the EU MRL legislation (i.e. food products covered by Annex I of Regulation (EC) No 396/2005 and residues covered by Annex II or III of the mentioned regulation) as valid results.

[32] Only a low number of samples was analysed for this pesticide (14 samples).

[33] The number of samples exceeding the legal limit is lower than the total number of determinations exceeding the legal limit, since multiple MRL exceedances were found in a number of samples (463 samples).

(RD), methamidophos, methomyl (RD), buprofezin, permethrin, malathion (RD), endosulfan (RD), lufenuron, carbofuran (RD) and imazalil.

In total, 1,253 MRL exceedances were reported for pesticides currently not approved in the EU (including active substances that were previously approved in the EU). In most cases these MRL exceedances for non-approved pesticides were related to imported products (957 cases) while for products produced in the EU and EFTA countries, a minority of MRL exceedances was resulting from non-approved pesticides (245 results) and products with unknown origin (51 results); 2,012 cases of MRL exceedances were related to approved pesticides (1,095 MRL exceedances on third country products, 807 cases on EU products and 110 cases in products with unknown origin).

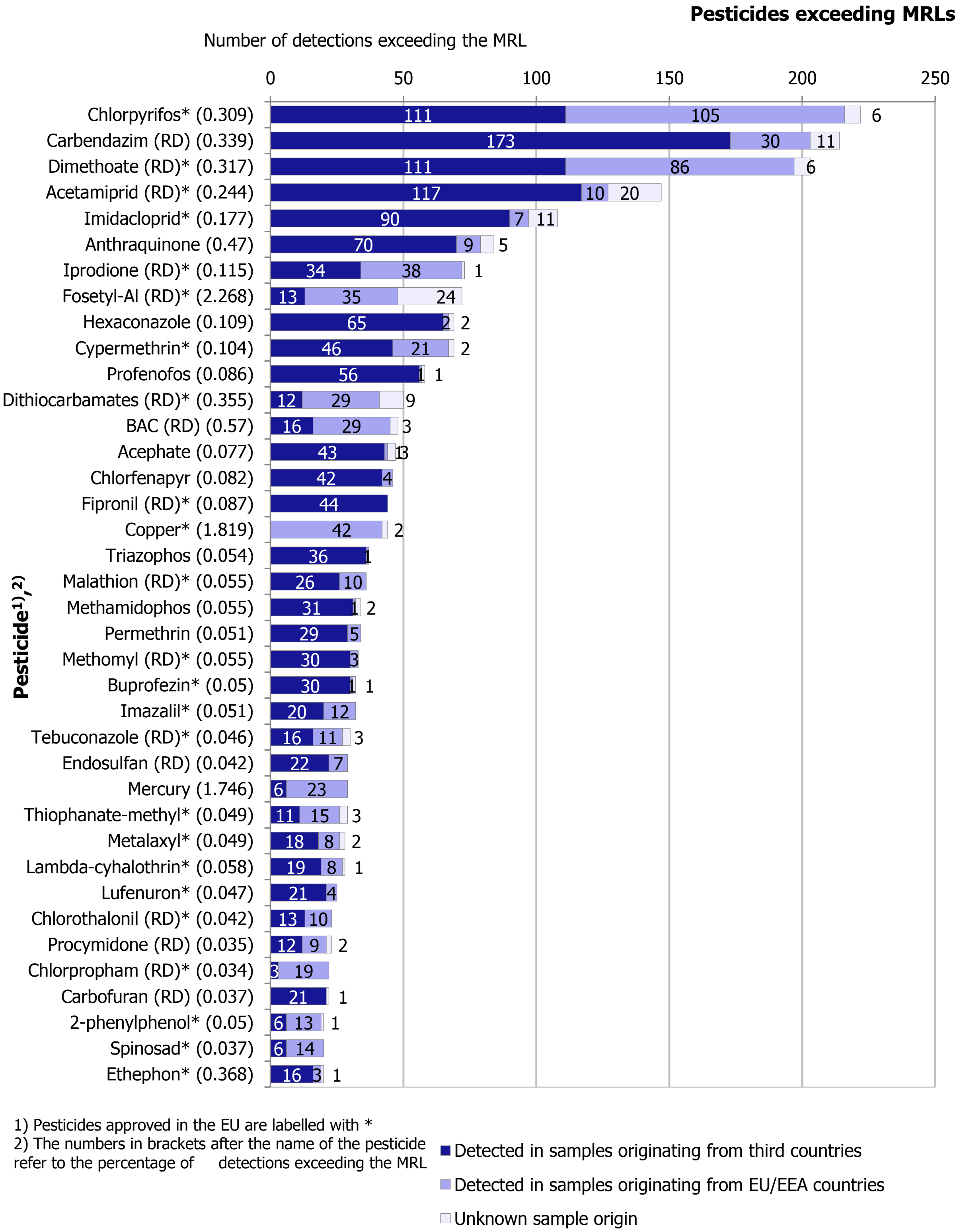


Figure 50: Number of detections per pesticide exceeding the MRL (by sample origin)

4.2.4. Results for import controls under Regulation (EC) No 669/2009

According to the provisions of Regulation (EC) No 669/2009, certain food products from Cambodia, China, the Dominican Republic, Egypt, Kenya, Morocco, Nigeria, Peru, Thailand, Turkey and Vietnam were subject to an increased level of official controls for certain pesticides at the point of entrance into the EU territory. A description of the required controls (type of products, countries of origin, the type of hazard and the frequencies of controls) relevant for the calendar year 2014 can be found in Appendix C, Table 19.

In total, results for 6,513 samples taken in the framework of import controls in were reported to EFSA. The major amount of import control samples were analysed by four countries, i.e. Bulgaria (2,949 samples), the Netherlands (1,621 samples), France (789) and Belgium (604 samples).

Overall, 406 samples (6.2%) of import control samples exceeded the legal limit for one or several pesticides; 237 samples (3.6%) were considered as non-compliant, taking into account the measurement uncertainty. In 96 of the samples, multiple MRL exceedances were measured (289 individual residue determinations were above the legal limit). It should be highlighted that non-compliant products identified in the framework of import controls are rejected at the border and are not placed on the EU market. For 243 samples, follow-up actions were reported, comprising mainly administrative sanctions, issuing of warnings or notification in the framework of the Rapid Alert System.[34]

In Figure 51, the results for import controls are summarised; the dark orange bars reflect the MRL exceedance rate of samples taken at border inspections while the dark blue bars present the percentage of samples that contained residues above the LOQ but within the legally permitted concentration.

In addition to the samples that were checked at the border, 1,416 samples of products covered by the provisions of Regulation (EC) No 669/2009 were taken under national control programmes at different stages of the food chain. For the samples that entered the EU common market without being checked at the border, the MRL exceedance rates and the detection rates are included in the Figure 51 as light orange and light blue bars. For most of the products the MRL exceedance rate at border inspections were in the same range as for samples taken in the framework of national controls. However, higher MRL exceedance rates were noted in national programmes for certain products (e.g. peppers from Vietnam and Egypt, aubergine from Cambodia, peppers from the Dominican Republic, coriander leaves from Thailand, dragon fruit from Vietnam, mint from Morocco, strawberries from Egypt and table grapes from Peru). The difference may result from the fact that in the national control programmes Member States target efficiently towards non-compliant producers or importers, based on previous results while for the border controls under Regulation (EC) No 669/2009 the lots are selected randomly.

Comparing the results for import controls submitted to EFSA with the results summarised in the report published by the European Commission on increased checks on import of food of non-animal origin,[35] EFSA noted discrepancies regarding the number of samples analysed and the number of MRL exceedances.[36] A closer collaboration between EFSA and the European Commission service responsible for the import controls should be established to exchange information and identify the need for corrective measures to avoid discrepancies, e.g. improvement of the coding of samples.

More details on the pesticides found in concentrations exceeding the legal limit are summarised in the Excel file published as supplement to this report.

[34] Information on the RASFF notifications can be found under the following link: http://ec.europa.eu/food/safety/rasff/index_en.htm

[35] Published online: http://ec.europa.eu/food/safety/docs/oc_leg_imports_dpe_ms_border-checks-results_2014.pdf

[36] Among the complete dataset submitted to EFSA, the import control samples are identified by a combination of data elements (i.e. code for food product, origin of the sample, product treatment, type of sampling programme and the sampling strategy). If the coding rules were not respected, samples are not correctly identified as import control samples. Detailed analysis should be performed to identify the reasons for the mismatch of number of samples and to remind Member States to follow the conventions for coding.

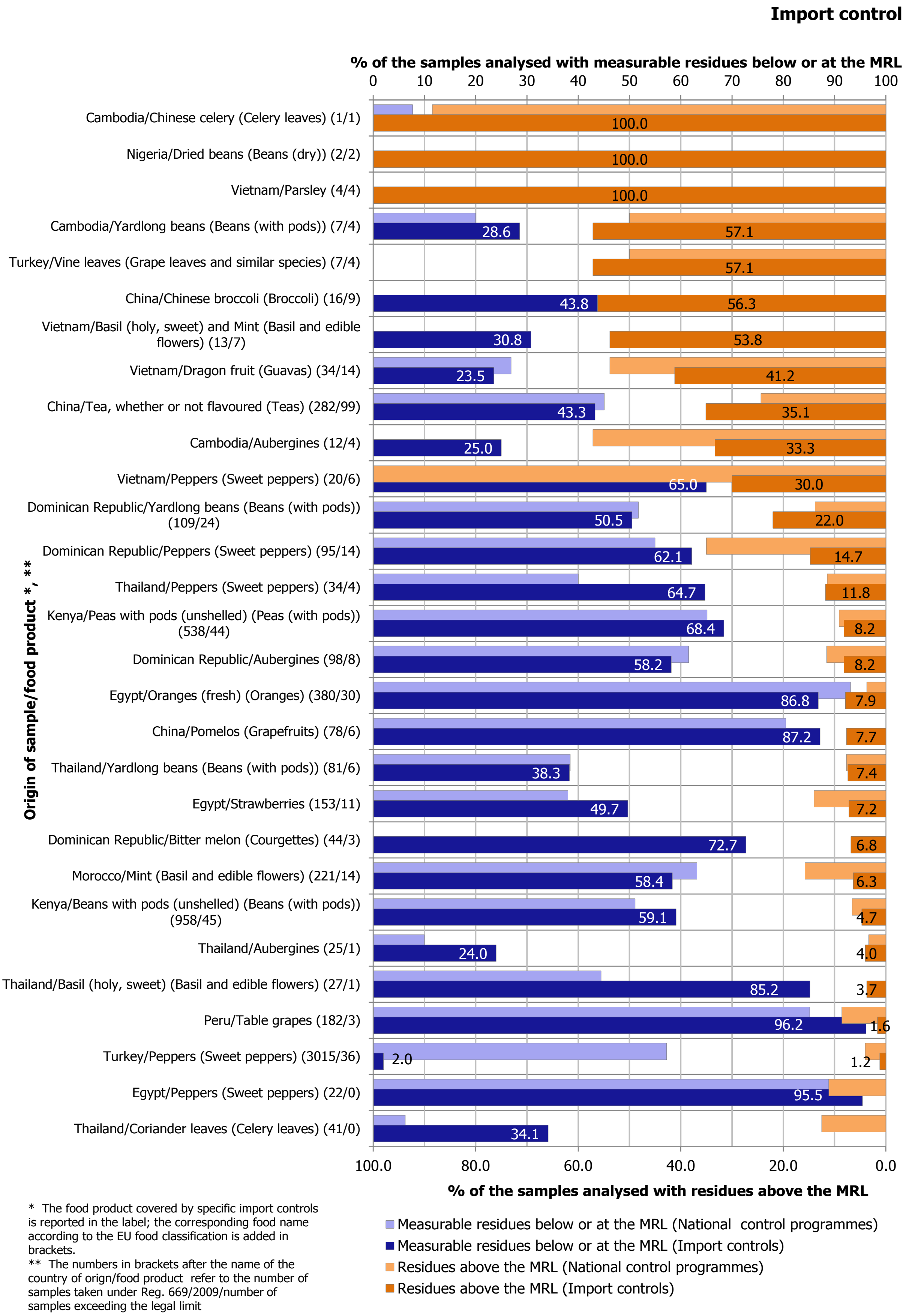


Figure 51: MRL exceedance and detection rate for samples analysed in the framework of import controls under Regulation (EC) No 669/2009, sorted according to the MRL exceedance rate

4.2.5. Results for baby foods

Reporting countries analysed 1,812 samples of baby foods (i.e. food covered by Directive 2006/125/EC and 2006/141/EC), such as infant formulae, follow-on formulae, processed cereal-based foods for infants and young children and baby foods other than processed cereal-based foods. The 218 infant formulae and follow-on formulae taken in the framework of the EUCP are comprised in this figure.

In 148 samples (8.2%), pesticide residues at or above the LOQ were found while the majority of samples were free of quantifiable residues (91.8%). In 9 samples more than one pesticide was detected (Figure 52). For 2% of the samples (37 samples) reporting countries considered the residue concentrations exceeded the legal limit (details see below); 1.8% of the samples (33 samples) were considered non-compliant, taking into account the measurement uncertainty. Compared with the overall results for other products, the detection rate (residues between the LOQ and the MRL) was significantly lower in baby food samples (43.4% detection rate for all food groups). In 2013, the detection rate was in a comparable range (2013: 7.3% samples with residues at or above the LOQ).

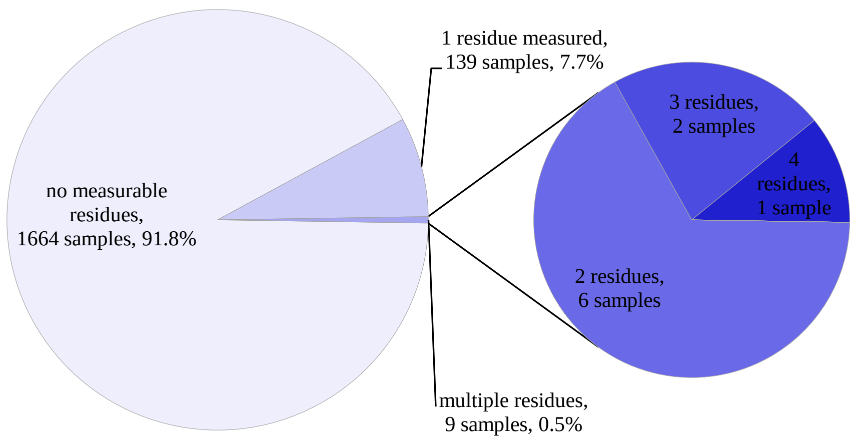


Figure 52: Number of detectable residues in individual baby food samples

In 2014 in total, 27 different pesticides were detected in concentrations above the LOQ. Similar to the previous reporting year, the most frequent compound detected in baby foods was copper (85 detections, mainly in follow-on formulae and infant formulae). Copper is a nutrient that has to be added to infant formula and follow-on formula and can be added to processed cereal-based food and baby food.[37] Copper compounds in baby foods may result from different sources (natural occurrence of copper in plant or animal products, use of plant protection products, feed additives or copper added to baby foods in accordance with the requirements of Directive 2006/125/EC and 2006/141/EC). In addition, fosetyl-Al (RD) and the biocidal products DDAC and BAC (RD) were among the most frequently detected compounds in baby foods (29, 9 and 8 determinations, respectively). These three compounds were predominantly found in baby foods other than cereal-based foods covered by Directive 2006/125/EC.

According to the evaluation of reporting countries, only 36 samples (2.0% of the analysed baby food samples) exceeded the legal limit (24 samples containing fosetyl-Al (RD), 4 samples containing BAC (RD), 3 samples containing DDAC, 2 samples with ethoxyquin and etofenprox residues, respectively, 1 sample with copper residues and 1 sample with chlorpropham residues); in 1 sample multiple MRL exceedances were identified. Thus, for the majority of samples with residues of copper or fosetyl-Al (RD) exceeding the default MRL Member States did not take enforcement actions.

In Figure 53 the results for baby foods are summarised, presenting the residue concentration measured for the 27 pesticides detected in concentrations above the LOQ as percentage of the MRL set for baby food.[38] The orange dots refer to samples taken in the framework of the national control

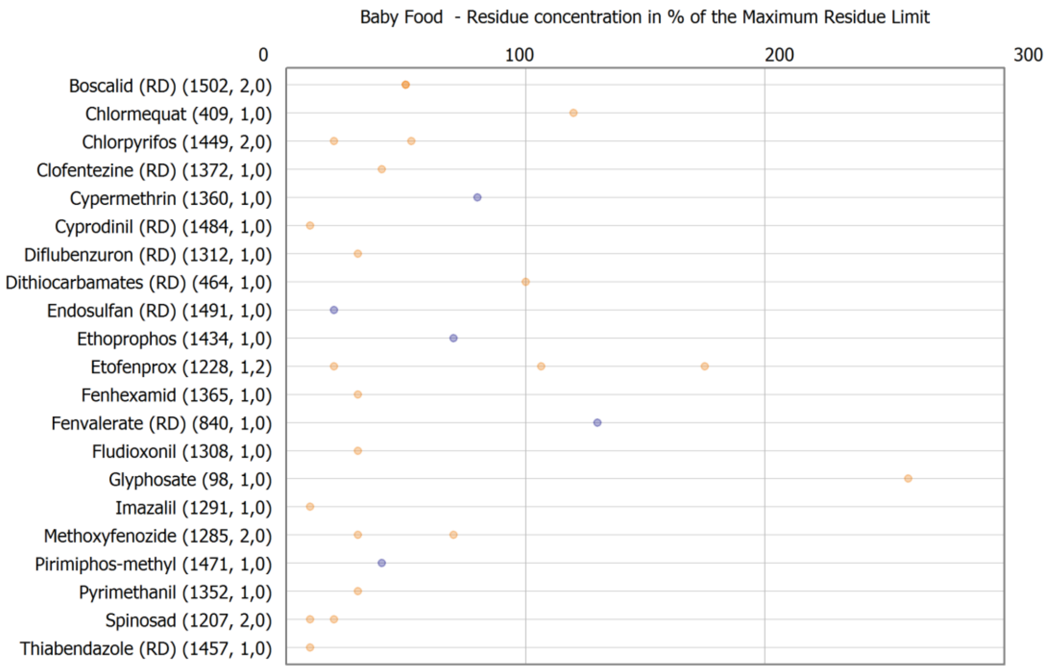
[37] Specidif chemical forms are authorised in the EU legislation (e.g. cupric carbonate, cupric citrate etc.).

[38] In general, a default MRL of 0.01 mg/kg is applicable for food covered by Directive 2006/125/EC and 2006/141/EC unless lower legal limits for the residue levels are defined in the Directives. Thus, the provisions are more restrictive than for other food falling under the provisions of Regulation 396/2005.

programmes, while the blue dots label the samples taken in the framework of the EU-coordinated monitoring programme. Overall, EFSA noted 161 determinations in 135 samples (7.5% of the baby food samples) where the measured residue concentration exceeded the default MRL of 0.01 mg/kg; most of these results are related to copper (85 determinations, 79 in infant and follow-on formulae) and fosetyl-Al (29 determinations).

With the exception of copper, fosetyl-Al, BAC (RD), DDAC and ethoxyquin, the other detected pesticides occurred in low concentrations, mostly below the legal limit, which gives an indication of contaminations or the mixing of treated and untreated food products.

Although the overall MRL exceedance rate seems to be higher in baby foods than for other food product groups, in particular in organic baby foods (see also Section 4.2.6), this phenomenon is mainly related to the results for fosetyl-Al and copper. It would be appropriate to investigate further the source of fosetyl-Al residues. In addition, the appropriateness of the current default MRL should be re-considered, taking into account other possible sources of these residues, such as feed additives. It should be also highlighted that the pesticides detected in baby foods were analysed only by a limited number of reporting countries (copper and fosetyl-Al (RD) were analysed only in Germany; DDAC and BAC (RD) were analysed only in Germany, Belgium, Malta, Norway and the United Kingdom). Hence, the results for these pesticides are biased and cannot be extrapolated to all samples for infants and young children.



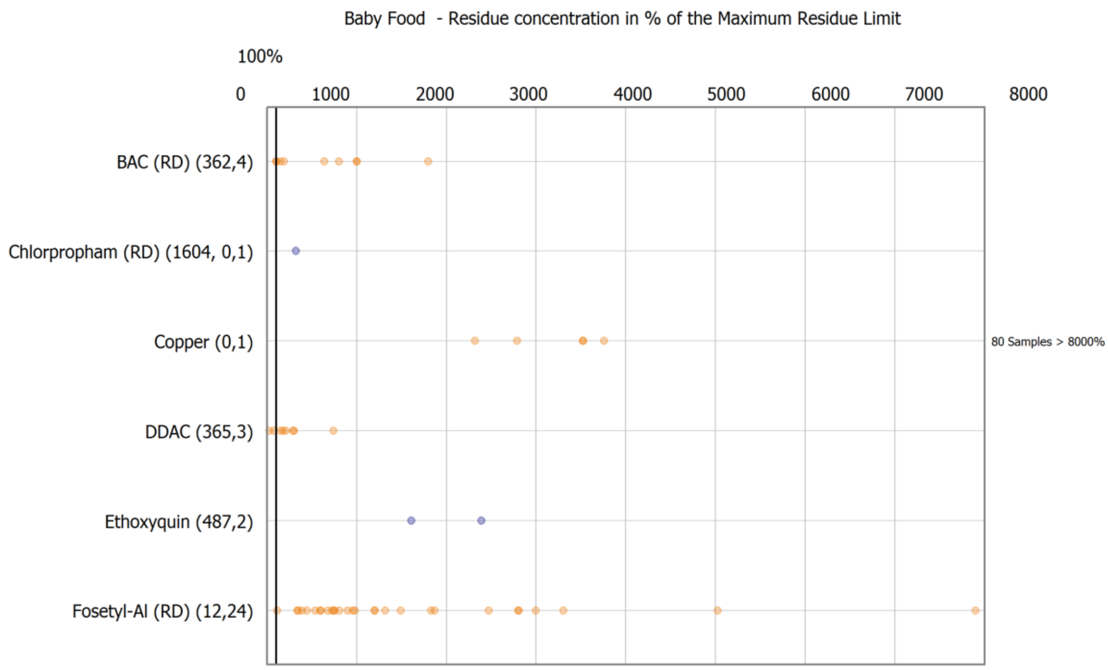


Figure 53: Residue concentrations measured in baby food, as percentage of the legal limit (only samples with residues >LOQ)

4.2.6. Results for organic food

In total 4,792 samples of organic food were taken (5.8% of the total number of samples); the 733 samples of organic products taken in the framework of the EUCP are also included in this number of samples. 4,140 samples did not contain quantifiable residues (86.4%); 595 samples of organic products contained residues within the legally permitted concentrations (12.4%); among these samples, 220 samples contained residues that are most likely not resulting from the use of pesticides (e.g. samples containing naturally occurring substances like bromide ion or copper,[39] samples with

[39] Copper compounds are permitted to be used in organic farming.

residues of CS_2 resulting from naturally occurring substances mimicking the presence of dithiocarbamates) or substances that are persistent contaminants present in the environment (e.g. DDT, dieldrin, hexachlorobenzene, heptachlor, hexachlorocyclohexane or lindane). After excluding the samples containing one of the substances mentioned, the corrected pesticide detection rate for organic samples accounts for approximately 9.3%. The MRL exceedance rate however, is not affected by this refined analysis. MRL exceedances were identified in 57 samples (1.2% of the organic samples analysed); multiple MRL exceedances were found in eight samples.

Compared with the overall results for other products, the MRL exceedance rate and the detection rate (residues between the LOQ and the MRL) were significantly lower in organic food samples (MRL exceedance rate: 1.2% in organic food versus 3.0% for conventional food; detection rate: 12.4%[40] in organic food versus 45.3% in conventional food). In Figure 54 the individual food groups are analysed separately, showing the major difference mainly for fruits and nuts, vegetables and cereals. For baby food, the MRL exceedance rate was higher for organic products compared to conventionally produced food. The relatively higher MRL exceedance rate for baby foods is mainly due to MRL exceedances for fosetyl-Al reported by Germany. The detailed analysis of baby food results, in particular which pesticides were detected and which were found in concentrations exceeding the legal limit, are reported in Section 4.2.5.

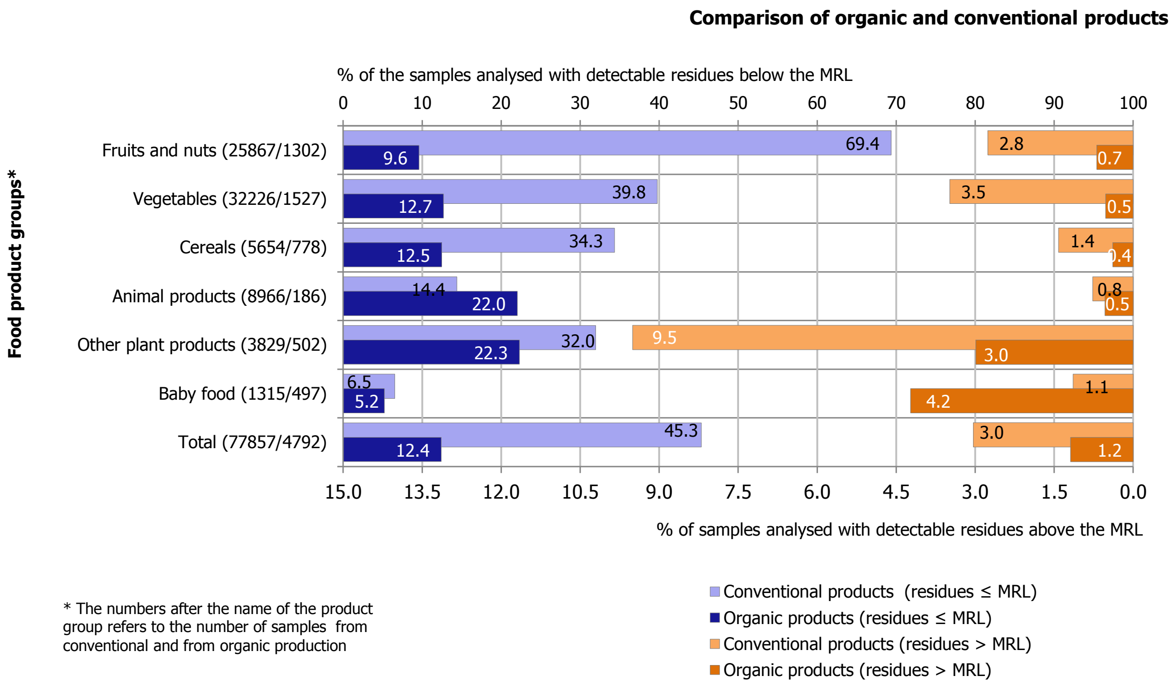


Figure 54: Comparison of organic and conventional foods: detection and MRL exceedance rates for main food product groups (including all pesticides)

In products produced organically, 136 different pesticides were found in quantifiable concentrations (above the LOQ); 21 thereof were found only in trace amounts (less than or equal 0.01 mg/kg). The pesticides detected most frequently (found in at least five samples) are presented in Figure 55. In this figure the number of detections in trace concentrations (less than 0.01 mg/kg) was presented separately (light blue bars); the pesticides permitted in organic farming, compounds occurring naturally or substances resulting from environmental contamination (persistent pesticides no longer used in the EU) are specifically labelled. The most frequently quantified pesticide residues were copper, fosetyl-Al, spinosad, bromide ion and chlorpyrifos. Copper, spinosad, azadirachtin as well as pyrethrins (RD) are allowed in organic farming; thus, the presence of residues of these compounds is linked to agricultural practices permitted in organic farming. Residues of hexachlorobenzene, DDT, lindane and dieldrin are resulting from environmental contaminations in soil, due to the use of these

[40] For this comparison all pesticides were included; the naturally occurring substances covered by the MRL legislation were not excluded as they are also present in conventional foods and are therefore also covered in the calculation of the detection rate for conventional food.

persistent compounds in the past. Detections of copper, bromide ion and dithiocarbamates in certain commodities may result from naturally occurring plant products and are not necessarily related to the use of pesticides. BAC (RD) belongs to the group of quaternary ammonium compounds that nowadays are widely used as disinfectants, but since they have been used as pesticides in the past they fall under the remit of the pesticide MRL regulation.

The detection of the remaining pesticides reported in Figure 55 gives an indication that pesticides not permitted for use in organic farming were used; the presence of the pesticide residues in organic food may be also resulting from contaminations occurred during handling, packaging or processing of organic products, or is linked to wrong labelling of conventionally produced food as organic food.

MRL exceedances in organic products were reported for fosetyl-Al (RD) (20 cases), malathion (4 cases) and cypermethrin (4 cases) and additional 49 determinations for 30 different pesticides. The details on samples of organic products exceeding a legal limit can be retrieved from the Excel file published as supplement to this report.

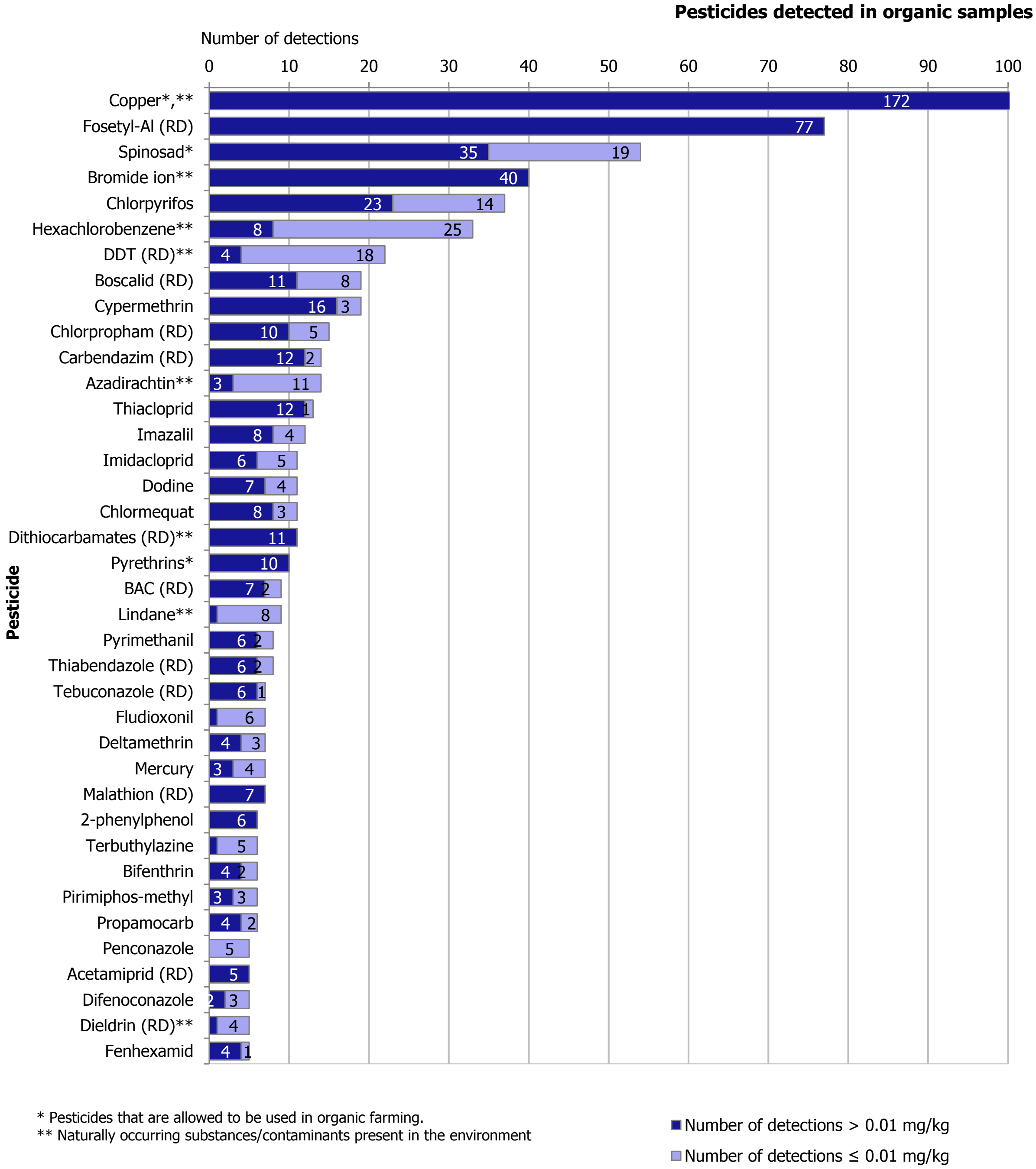


Figure 55: Pesticides most frequently detected in organic samples (at least five detections)

4.2.7. Results for animal products

In total, 9,152 samples of animal products covered by Regulation (EC) No 396/2005 were analysed. In Figure 56 the number of samples is detailed by food product/product group. The majority of these samples (84.7%, 7,751 samples) was free of measurable residues; in 418 samples more than one pesticide was detected (Figure 57). Compared with the overall results for other products the detection rate (residues between the LOQ and the MRL) was significantly lower in samples of animal products (43.4% detection rate for all food groups versus 15.3% in food of animal origin). In 70 samples (0.8%), an MRL exceedance was identified.

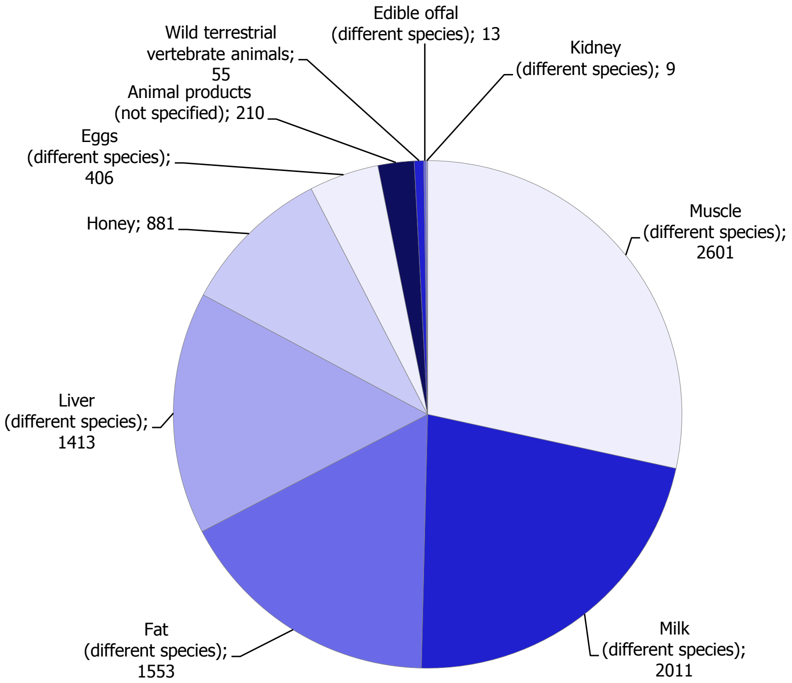


Figure 56: Number of samples of animal products

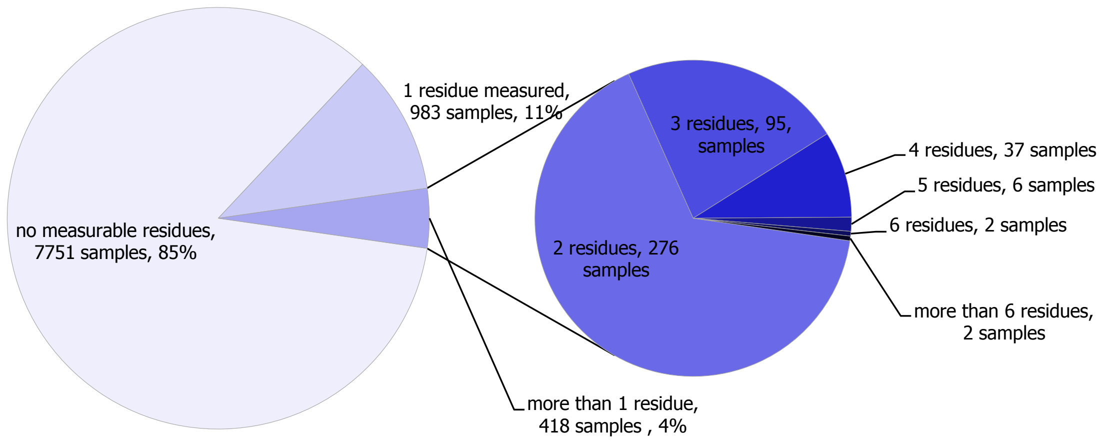


Figure 57: Number of samples of animal products

Among the 629 pesticides that were analysed in food of animal origin, 40 different pesticides were found in concentrations above the LOQ; the most frequently detected pesticide residues (detected in at least 15 samples) were copper, DDT (RD), hexachlorobenzene, hexachlorocyclohexane (beta), lindane, mercury (RD) thiacloprid, hexachlorocyclohexane (alpha), BAC (RD), chlordane (RD), dieldrin, DDAC, amitraz (RD), endosulfan (RD) and heptachlor (RD) (Figure 58). Most of these compounds are no longer used as pesticides in Europe, but they are still found in the food chain due to their persistence in the environment. It is noted that copper residues in animal products are not necessarily linked to the use of copper as pesticide but may result from the use of feed supplements, which contain copper compounds. Certain pesticides were repeatedly detected in honey, e.g. thiacloprid, dimoxystrobin, azoxystrobin, boscalid, lambda-cyhalothrin; they are due to the use of the pesticides in crops that are foraged by bees. Coumaphos and amitraz residues were also detected in honey, but these compounds more likely originate from treatments of beehives with products authorised under the legislation for veterinary medicinal products rather than from the use of pesticides since both substances are no longer authorised as pesticides in the EU.

In the Excel file published as supplement to this report, further details on the pesticide/commodity combinations are reported which were found to exceed the legal limits.

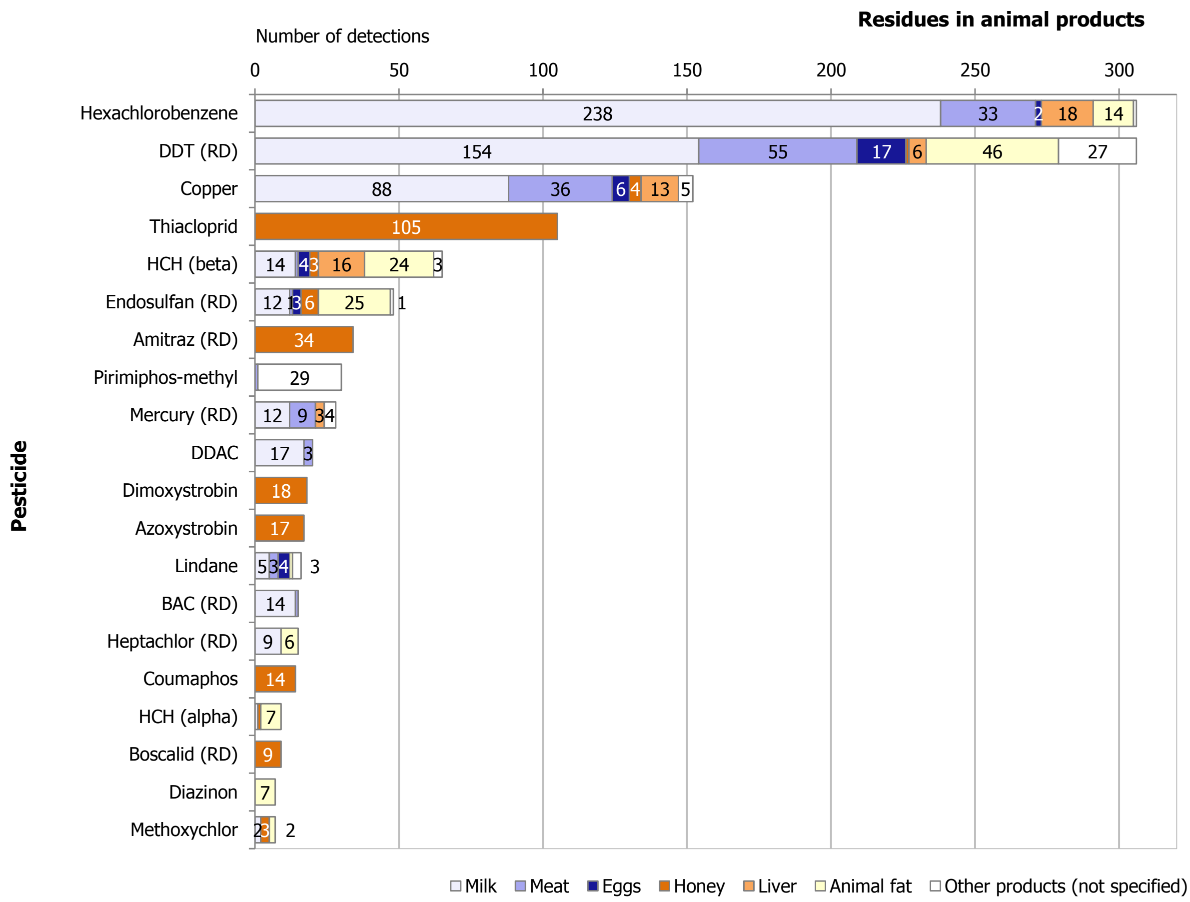


Figure 58: Pesticides detected most frequently in animal products

4.2.8. Results for glyphosate residues in food

Glyphosate, an herbicide that attracted a high level of public interest, was analysed by 22 reporting countries. Overall, 4,721 samples of different products (including processed products) were analysed for glyphosate residues, mainly fruits and nuts (1,662 samples), vegetables (1,359 samples) and cereals (1,348 samples). It is noted that Member States took a limited number of oilseeds and soybeans samples although these crops are likely to be treated with glyphosate and therefore residues may be expected. No information on glyphosate residues in animal products is available. It should be highlighted that 68.2% of the results are related to samples analysed in Germany.

4.2% of the samples analysed for glyphosate contained measurable residues of this active substance, but within the legal limits. Considering the different food products analysed, the highest detection rate was observed in sunflower seeds (50% detection rate with 3 out of 6 samples containing residues of glyphosate, but within the legal limit), followed by dry lentils (38.3% detection rate), mustard seeds

(33.3% detection rate), peas dry (30.8% detection rate), linseeds (26.5%) and soybeans (25%). However, since only a limited number of samples of these products was analysed for glyphosate (less than 100 samples) the results are statistically not very robust.

In cereals glyphosate was mainly found in barley (23.4% of the samples analysed for glyphosate) followed by wheat (8.3% detection rate), oats (7.7%) and rye (6.3%). Only one sample exceeded the legal limit (beans (dry), containing 2.3 mg/kg; the MRL is set at the level of 2 mg/kg).

4.2.9. Multiple residues in the same sample

Multiple residues in one single sample may result from the application of different types of pesticides (e.g. application of herbicides, fungicides or insecticides against different pests or diseases or use of different active substances avoiding the development of resistant pests or diseases). Besides these agricultural practices, multiple residues may also be due to mixing or blending of lots with different treatment histories, contaminations during food processing, uptake of persistent residues via soil, or spray drift on the field. According to current EU legislation, the presence of multiple residues in a sample is not considered as an infringement of the MRL legislation as long as the individual residues do not exceed the individual MRLs.

Residues of more than one pesticide (multiple residues) were found in 28.3% of the samples analysed (23,420 samples) (Figure 59); in unprocessed products the frequency of multiple residues was higher (30.7%) compared with processed products where 10.8% of the samples analysed contained more than 1 pesticide in concentrations greater than the LOQ. Notably, 604 samples contained 10 or more pesticides (118 samples of processed and 112 samples of unprocessed table grapes, 67 samples of tea, 51 samples of strawberries, 28 samples of apples, 24 samples of pears, 22 samples of sweet peppers.

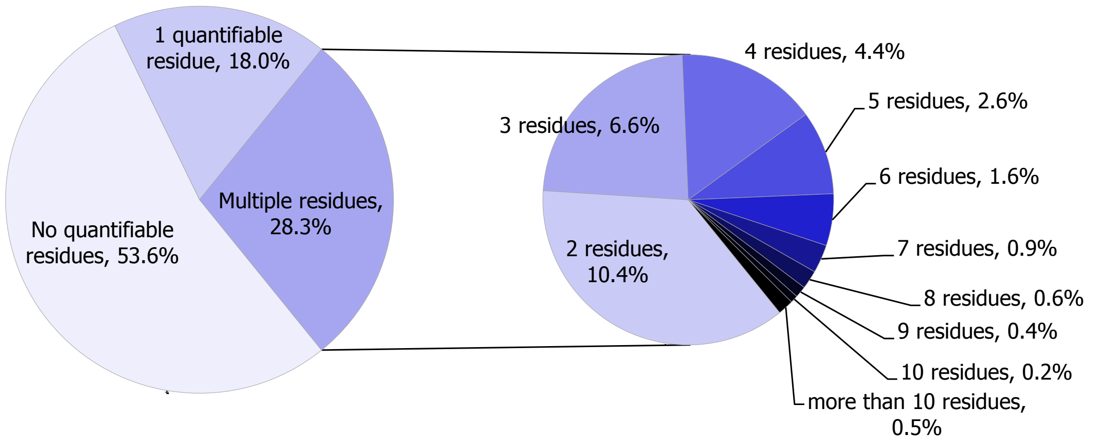
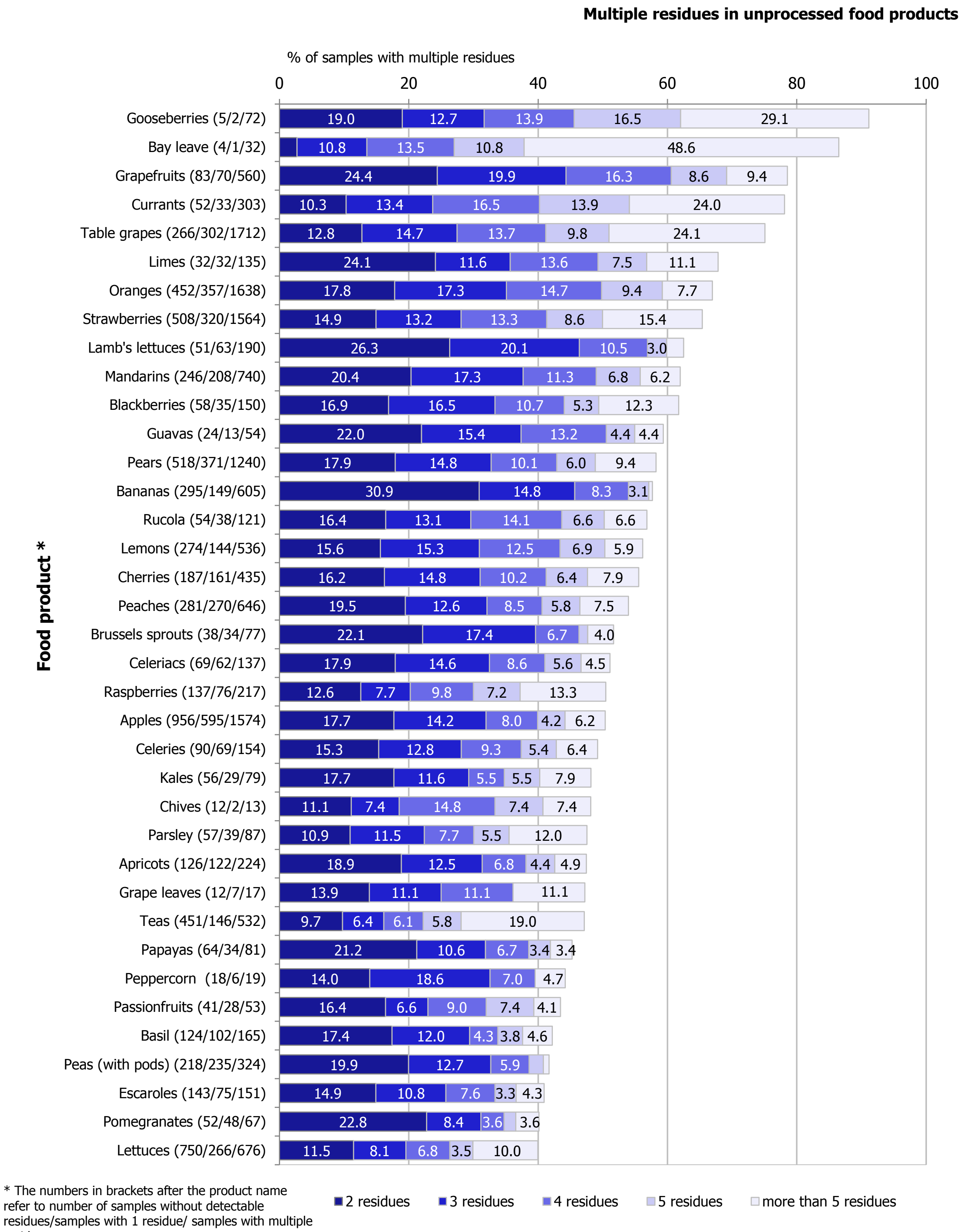


Figure 59: Multiple residues detected in surveillance samples (processed and unprocessed products)

Focussing on unprocessed food products with a substantial number of results (more than 20 samples analysed), the highest frequency of multiple residues was found in gooseberries (91.1% of the samples analysed contained multiple pesticide residues), followed by bay leaves (86.5%), grapefruit (78.5%), currants (78.1%), table grapes (75.1%), limes (67.8%), oranges (66.9%), strawberries (65.4%) and lamb's lettuce (62.5%). In addition, mandarins, blackberries, guavas, pears, bananas, rucola, lemons, cherries, peaches, Brussels sprouts, celeriac, raspberries and apples were found to contain multiple residues in more than 50% of the samples analysed. In Figure 60 the results for the top ranked food products with multiple residues are presented, broken down by the number of detected residues; products which were analysed only seldom (less than 20 samples) were not included in the analysis. A similar analysis was performed for processed food products (Figure 61). Among these products, the highest frequency of multiple residues was found for processed grapes (e.g. raisins), processed apricots, wild and cultivated fungi (e.g. dried fungi), peppers (e.g. paprika powder).



* The numbers in brackets after the product name refer to number of samples without detectable residues/samples with 1 residue/ samples with multiple residues.
Only unprocessed products with at least 20 samples.
Data labelled only if ≥3%.

Figure 60: Food products most frequently containing multiple residues (unprocessed products)

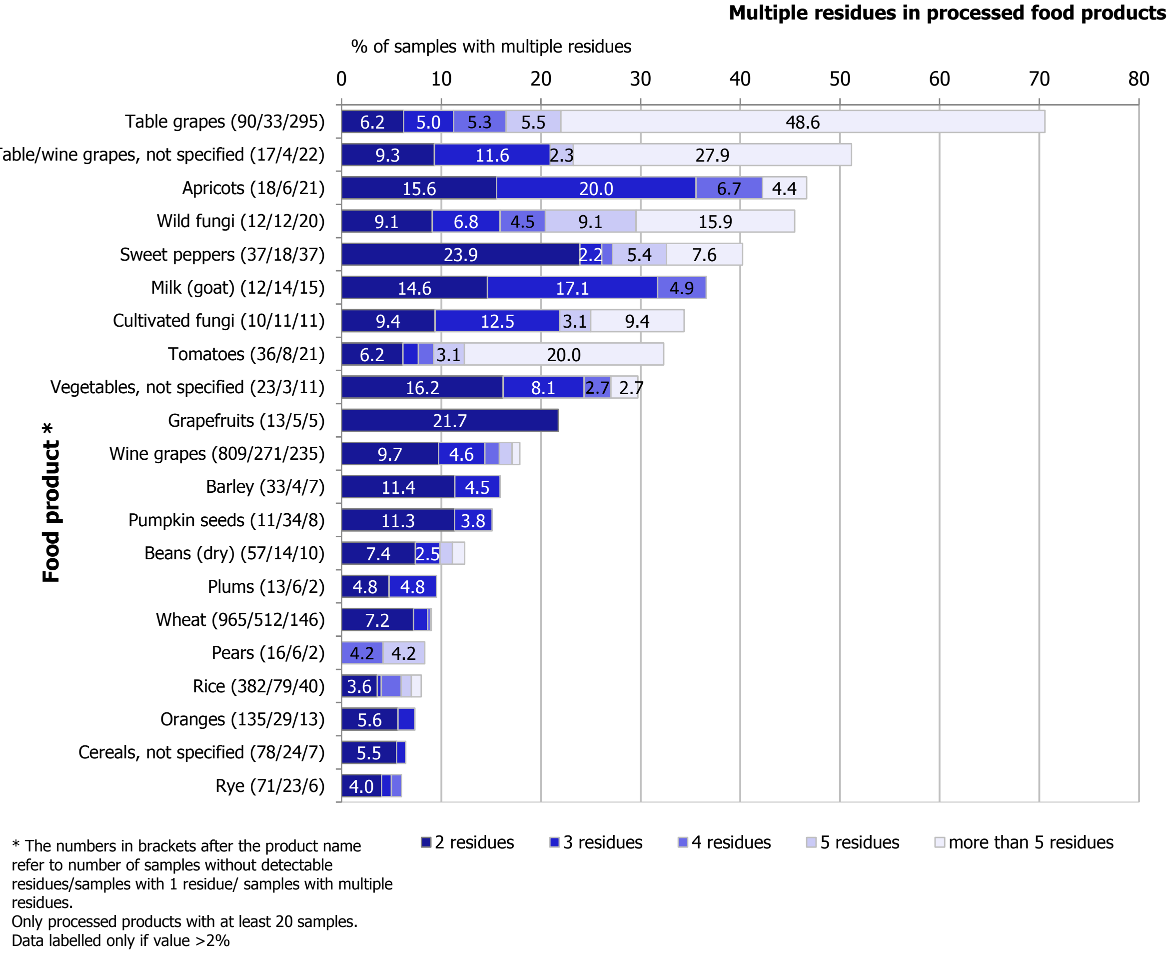


Figure 61: Food products most frequently containing multiple residues (processed products)

The presence of multiple residues is not considered as a non-compliance with MRL legislation as long the individual pesticide does not exceed the respective legal limits. However, food products with multiple residues should be assessed carefully by the competent authorities in view of possible violations of provisions of Regulation (EC) No 396/2005. The concerned products may be a result of practices that are not in line with Article 19 of the aforementioned regulation (e.g. mixing of lots with the purpose of diluting the residues). Equally, the presence of multiple residues may give an indication that the principles of good plant protection practice were not respected (application of several pesticides with a similar mode of action with the purpose to avoid using single pesticides at dose rates that would lead to exceedances of the MRL).

4.3. Reasons for MRL exceedances

It needs to be borne in mind that MRLs are established based on supervised residue trials that should reflect the residue behaviour under conditions expected to occur in practice. The level of the MRL is calculated using statistical methodologies. The MRL usually is established to cover at least the upper confidence interval of the 95th percentile of the expected residue distribution. Thus, a low percentage of approximately 1% MRL exceedances is expected to occur even if the approved Good Agricultural Practices are fully respected.

In total, 2,421 samples exceeded the legal limit (2.9% of samples analysed); for 463 samples multiple MRL exceedances were reported (92 EU/EEA origin, 347 samples from third countries, 24 samples with unknown origin). Overall, 3,265 individual determinations were reported to violate the EU legal limits.

To identify possible reasons for MRL exceedances that go beyond the expected exceedance rate, EFSA analysed separately the results referring to samples originating from the EU/EEA countries and from third countries.

Among the samples breaching MRLs, 1,369 samples originated from third countries. In these products, a total of 2,052 individual determinations exceeded the legal limits; 965 determinations were resulting from targeted sampling (enforcement samples). 582 of these MRL exceedances in products from third countries were related to products that were in focus of import controls under Regulation (EC) No 669/2009 (see Section 4.2.4). Exceedances of the MRL were most frequently detected (more than 100 samples) in tea, peppers (sweet or chilli peppers), beans with pods (including yardlong beans) and celery leaves (including coriander leaves or other products that according to the food classification for pesticide residues fall in the same category). A total of 45%[41] of the MRL exceedances noted in imported products were related to residues that are no longer approved in the EU or that were never.

The possible reasons for MRL exceedances in products imported from third countries are summarised as follows:

- Use of pesticides that are not or no longer approved in the EU on crops for which no import tolerances have been requested by the importers, as foreseen in Article 6 of Regulation (EC) No 396/2005;
- Use of pesticides that are approved in the EU, but on crops for which no import tolerances have been requested by the importers;
- Contaminants with unclear origin in concentrations exceeding the legal limit (e.g. anthraquinone in tea and other crops);
- MRL exceedance due to natural background levels (e.g. dithiocarbamates in passion fruit);
- Presence of biocides that also fall under the pesticide legislation (e.g. BAC or DDAC).

Among the samples originating from the EU or EEA, overall 932 samples exceeded one or several legal limits, with 92 samples with multiple MRL exceedances, resulting in 1,052 individual MRL breaches. Among these cases, 185 of the 1,052 MRL exceedances were caused by non-approved substances (17.6%), most frequently carbendazim[42] (30 determinations) followed by procymidone, dieldrin and anthraquinone[43] (9 determinations, respectively). Among the approved pesticides, chlorpyrifos was the substance found most frequently in concentrations exceeding the legal limits (105 cases, mainly in carrots, potatoes, apples, parsley and cucumbers), followed by dimethoate (86 cases, mainly in cherries, apples, radishes and cucumbers).

The product groups with EU/EEA origin most frequently exceeding the legal limits were spinach, apples, carrots, grape leaves, lettuce, table grapes, cucumbers, strawberries, and pears. Notably, in liver a number of MRL exceedances were identified, related to copper compounds.

Possible reasons for MRL exceedances in products produced in the EU and EEA countries are summarised as follows:

- Use of approved pesticides but not in accordance with the Good Agricultural Practices; in particular the use of plant protection products on crops for which no authorisation was granted or not respecting the application rate, the pre-harvest interval, the number of applications, or the method of application, e.g.
  - chlorpyrifos in carrots, potatoes and other crops;
  - dimethoate in cherries, radishes, apples and other crops;
  - iprodione in celeriac, lettuce, spinach, apples, and other crops;
  - use of folpet on table grapes while the authorisation is limited to wine grapes;
  - carbendazim residues in different crops;
  - dithiocarbamates in spinach and other crops.

[41] The approavel for carbendazim expired in November 2014. Carbendazim is also a metabolite of the approved active substance thiophanate methyl. For this analysis carbendazim is considered as a non-approved active substance; MRL exceedances for carbendazim are unlikely to occur if thiophanate-methyl is used in accordance with the authorised GAP.

[42] See previous footnote.

[43] Antrhrquinone was mainly found in tea; it was reported as sample originating from one of the EU Member States, sicne it was processed in the EU.

- Residues of fosetyl-Al, possibly resulting from the use of foliar phosphorous fertilizers, which could mimic the treatment with fosetyl-Al.
- Certain substances that fall under the pesticide legislation are also used for other purposes (e.g. as biocides/disinfectants, feed additives) and the MRLs set under Regulation (EC) No 396/2005 do not reflect the other sources of residues:
  - BAC and DDAC in leafy vegetables, milk, and other crops or animal products;
  - copper residues in bovine liver.
- Environmental contaminants exceeding the MRLs:
  - mercury in dry lentils or wild fungi;
  - dieldrin in pumpkins, carrots or cucumbers;
  - chlormequat/pears.

The origin of the product was not reported for 161 cases (120 samples with 24 samples with multiple MRL exceedances) where residues were found in concentrations that exceeded the legal limit.

More details on pesticide/crop combinations exceeding the legal limits are compiled in an Excel file published as supplement to this report.

5. Dietary exposure and dietary risk assessment

In the acute or short-term exposure assessment, the uptake of pesticide residues via food consumed within a short period, usually within one meal or one day, is estimated. The chronic or long-term exposure assessment aims to quantify the pesticide intake by consumers over a long period, predicting the lifetime exposure. A comparison of the estimated chronic and acute dietary exposure with the relevant toxicological reference values for long-term and short-term exposure (i.e. the acceptable daily intake (ADI) and the Acute Reference Dose (ARfD)), gives an indication of whether consumers are exposed to pesticide residues that may pose a health risk. As long as the dietary exposure is lower than or equal to the toxicological reference values, based on current scientific knowledge, a consumer health risk can be excluded with a high probability. However, possible negative health outcomes cannot be fully excluded if the exposure exceeds the toxicological reference values.

EFSA calculated the short-term and long-term dietary exposure estimating the consumer health risks resulting from pesticide residues in and on food using a similar approach as in previous years (EFSA, 2013a, 2014d). For estimating the actual acute and chronic exposure to pesticide residues present in food that was analysed in monitoring programmes, EFSA used the deterministic risk assessment methodology. This method was originally developed for the risk assessment in the context of pesticide authorisations (EFSA PRIMo) (EFSA, 2007). The model implements the principles of the WHO methodologies for short-term and long-term risk assessment (FAO, 2009), taking into account the food consumption of the European population. The calculations should be understood as a conservative risk assessment screening, meaning that the results are likely to overestimate the actual exposure. In most cases where an exceedance of the ADI/ARfD was noted with the screening method, more refined calculations could be performed, using additional information (e.g. information on the expected residues in edible part of the crop or in processed food or information on the amount of food consumed unprocessed/processed). However, due to the high number of pesticides and samples assessed, refined exposure calculations could not be performed systematically in the framework of this report.

The calculation tool (adapted version of EFSA PRIMo revision 2) used for the risk assessment screening is made available as a supplement to this report.

Results of cumulative risk assessments cannot yet be presented in the current report, as the scientific preparatory work is not yet completed (e.g. grouping of pesticides sharing a common target organ to derive cumulative assessment groups). The project on cumulative risk assessment is of high priority for EFSA. Information on the project is provided on the EFSA website.

5.1. Short-term (acute) exposure assessment – individual pesticides

The methodology used to calculate the short-term exposure is described in detail in the 2010 European Union report on pesticide residues (EFSA, 2013a).

For all food products of the 2014 EUCP, the exposure calculations were based on the consumption data for children since this subgroup of the population is more exposed to pesticide residues[44] for all the food products in focus. As mentioned before, the calculations were performed with assumptions which are likely to overestimate the actual exposure of European consumers (i.e. consumption of the concerned food products in high amounts without washing or any processing that would reduce the residues (e.g. cooking); in addition, it was assumed that the residue concentration in the consumed products was five to seven times higher than the residues measured in the samples analysed[45]).

The short-term exposure assessments were performed for the pesticides covered by the 2014 EU-coordinated programme[46], considering the 12 food products (i.e. beans with pods, carrots, cucumbers,

[44] For the food products covered by the 2014 EUCP, the food consumption of children, expressed on kg body weight, was higher compared to the normalised food consumption for adults.

[45] The approach using the so-called unit variability factor of 5 or 7 is used in the currently used risk assessment methodology for short-term dietary exposure, postulating an inhomogeneous distribution among the individual units. The variability factors are applied for mid-sized products like carrots, cucumbers, mandarins, oranges, pears, potatoes; for products that are normally mixed or bulked before consumption and for products with a small unit weight, no variability factor is applied (e.g. for rice flour, spinach, beans with pods).

[46] For 37 substances included in the EU-coordinated monitoring programme the setting of an ARfD was not necessary because of the low acute toxicity of the substances. These pesticides are therefore not relevant for acute exposure assessment.

mandarins, oranges, pears, potatoes, spinach, rice, wheat flour, liver, poultry muscle and poultry fat). The exposure was calculated for the 12,850 samples taken in the framework of the EUCP and additional 5,482 samples of the 12 food products for which the results were reported under the national control programmes. The calculations were carried out separately for each pesticide/crop combination as it is considered unlikely that a consumer would eat two or more different food products in large portions within a short period of time and that all of these food products would contain residues of the same pesticide at the highest level observed during the reporting year.

The short-term (acute) consumer exposure was performed using the following approach:

- EFSA calculated the short-term exposure for all pesticide/crop combinations covered by the 2014 EU-coordinated programme;
- For pesticide/crop combinations, where all reported results were below the LOQ, no acute exposure assessment was performed, assuming a no residue/no exposure situation;
- The exposure calculation for the unprocessed plant products (beans with pods, carrots, cucumbers, mandarins, oranges, pears, potatoes, spinach, rice) was based on the large portion food consumption implemented in the EFSA PRIMo (EFSA, 2007);
- For oranges and mandarins peeling factors were taken into account as far as available and where a refined calculation was considered necessary (e.g. if the unrefined calculations exceeded the toxicological reference value); for potatoes appropriate processing factors were considered, where available (see Table 13);
- The calculation of the exposure for wheat flour is based on the food consumption figure (large portion) of total wheat (including all wheat products);
- The calculation of the exposure for liver is based on the large portion of bovine liver;
- To estimate the exposure for poultry meat, the following approach was used:
    - For fat-soluble pesticides, the exposure was calculated assuming the poultry meat contained 10% of the residue measured in poultry fat, postulating a fat content of 10% for poultry meat.
    - For non-fat soluble pesticides, the exposure was calculated with residue concentration measured in muscle.
- The residue values reported according to the residue definition for enforcement (in accordance with the EU MRL legislation) were not recalculated to the residue definition for risk assessment, lacking a comprehensive list of conversion factors.

Overall, 38 pesticides were not relevant for the acute risk assessment (pesticides where due to the toxicological properties of the active substance the setting of an ARfD was considered not necessary).

Table 13: Processing factors used for refined exposure calculations

Food product/pesticide	Processing factors[(a)]	Reference	Comment
Oranges/mandarins			
Acetamiprid (RD)	0.03	EFSA, 2011a	The processing factors available for oranges were extrapolated to mandarins.
Buprofezin	0.18	EFSA, 2010b	
Carbendazim (RD)	0.46	EFSA, 2014c	
Chlorpyrifos	0.03	EFSA, 2012a	
Dicofol	0.03	BVL, 2002	
Dimethoate (RD)	0.14	BVL, 2002	
Dimethomorph	0.13	EFSA, 2011c	
Imazalil	0.07	EFSA, 2010a	
Lambda-cyhalothrin	<0.25	EFSA, 2015g	
Methidathion	0.03	BVL 2002	
Phosmet	0.33	EFSA, 2013c	

Food product/pesticide	Processing factors[(a)]	Reference	Comment
Propiconazole	0.01	EFSA, 2015a	
Pyraclostrobin	0.14	EFSA, 2011d	
Tebuconazole (RD)	0.14	EFSA, 2011b	
Thiabendazole (RD)	0.02	EFSA, 2016c	
Potatoes			
Chlorpropham	0.57	EFSA, 2012b	Processing factors for unpeeled, boiled potatoes
Thiabendazole	0.09	EFSA, 2016c	
Imazalil	0.14	EFSA, 2010a	Boiled potatoes (washed with peel)

(a): The processing factors were derived from previous EFSA assessments in the framework of MRL applications or MRL reviews under Regulation (EC) No 396/2005.

The estimated short-term exposure for the pesticide/crop combination was compared with the toxicological reference value, usually the ARfD value. The recently established and modified ARfD/ADI values or ARfD values for active substances that were not covered by the previous EU-coordinated programme are reported in Appendix D, Table 20. The toxicological reference values for the remaining pesticides are unchanged and can be retrieved from Appendix D, Table D1 of the 2013 EU report on pesticide residues (EFSA, 2015c). For ten pesticides with results above the LOQ, the short-term risk assessment has been performed with the ADI instead of the ARfD because these have not been evaluated with regard to the setting of the ARfD and/or the setting of the ARfD was not finalised (i.e. biphenyl, bromopropylate, chlordane, chlorfenvinphos, chlorobenzilate, heptachlor, hexaconazole, oxadixyl, phenthoate and phoxim). The use of the ADI instead of the ARfD is an additional conservative element in the risk assessment. It should be highlighted that some of the ARfD values were recently set or lowered and were not in place when the monitoring results were generated in 2014 (e.g. 2,4-D, amitrole, chlorpyrifos, famoxadone, glyphosate, pendimethalin and thiabendazole).

As the residue definition for dimethoate contains compounds with significantly different toxicities, it is not possible to perform an unambiguous risk assessment.[47] Thus, for this compound EFSA calculated two scenarios: the optimistic dimethoate scenario where it is assumed that the determined residues are related only to the less toxic compound dimethoate, and the pessimistic omethoate scenario, where the total residue concentration reported is assumed to refer to the more toxic compound omethoate.

Similarly, the residue definitions for fenvalerate (RD), methomyl (RD) and triadimenol (RD) contain compounds with different toxicological profiles. To perform the acute risk assessment, it was assumed that the residue found consisted solely of the authorised active substance.

Residues resulting from the use of dithiocarbamates are measured as CS_2, a common moiety of all the pesticides belonging to this group of chemicals. In addition, some crops contain naturally occurring substances that are covered by the analytical method mimicking the presence of dithiocarbamates. Thus, the analytical methods used do not distinguish which active substances were originally applied on the crop or whether the residue is resulting from natural sources. Hence, an unambiguous risk assessment is not possible since pesticides falling in the class of dithiocarbamates have different toxicological properties. For dithiocarbamates, five scenarios were calculated, assuming that the measured CS_2 concentration refers exclusively to maneb, mancozeb, propineb, thiram or ziram.

5.1.1. Results of the short-term (acute) risk assessment – individual pesticides

In Figure 62, the results of the short-term risk assessment are summarised. Grey cells refer to pesticide/crop combinations not covered by the 2014 EUCP or to pesticides not relevant for acute risk assessment (setting of an ARfD was not necessary). Empty, white cells in the grid refer to pesticide/crop combinations where the exposure was negligible because none of the samples analysed

[47] Some reporting countries reported the results for dimethoate and omethoate separately. However, as long as this reporting practice is restricted to several countries only, EFSA could not perform a comprehensive risk assessment taking into account the individual concentrations of the two compounds and the different toxicological potencies of dimethoate and omethoate.

contained measurable residues. The cells containing an asterisk refer to pesticide/crop combinations with detectable residues for which a risk assessment could not be performed lacking toxicological reference values. For pesticide where an ARfD/ADI is available and where at least one sample with detectable residues was reported, the exposure was calculated. The result reported in the graph refers to the sample containing the highest residue among all the samples analysed. The results are expressed as percentage of the ARfD/ADI. Pesticide/crop combinations where the calculated dietary exposure exceeded the ARfD are highlighted in orange (exposure between 100% and 1,000%: light orange, exposure above 1,000%: dark orange), whereas pesticide/crop combinations where exposure was calculated to be below the toxicological reference values are indicated in yellow.

Overall, for 37 pesticides (pesticides relevant for acute exposure assessments) not a single result above the LOQ was reported for any of the food products tested. Thus, for these pesticides the short-term dietary exposure was considered negligible for all of the food products covered by the EUCP (aldicarb (RD), amitrole, azinphos-ethyl, benfuracarb, bitertanol, dichlofluanid, dicrotophos, endrin, EPN, ethion, fenitrothion, fenpropidin (RD), formothion, glufosinate (RD), ioxynil (RD), isocarbophos, isofenphos-methyl, isoprocarb, mepanipyrim (RD), meptyldinocap (RD), metazachlor, metconazole, methoxychlor, metobromuron, nitenpyram, oxydemeton-methyl (RD), parathion, parathion-methyl (RD), phosalone, propoxur, pyrazophos, resmethrin, rotenone, tolylfluanid (RD), topramezone, trichlorfon and vinclozolin (RD)).

For 102 pesticides, residues were found in the food products analysed in concentrations above the LOQ, but the exposure was below the toxicological reference values (i.e. 2,4-D (RD), abamectin (RD), acephate, acetamiprid (RD), acrinathrin, amitraz (RD), azinphos-methyl, bifenthrin, biphenyl, bromopropylate, bromuconazole, buprofezin, carbaryl, chlordane (RD), chlorfenapyr, chlorobenzilate, chlorothalonil (RD), chlorpyrifos-methyl, clothianidin, cyfluthrin, cymoxanil, cypermethrin, cyproconazole, cyromazine, diazinon, dichlorprop (RD), dicloran, dicofol, difenoconazole, dimethomorph, dithianon, dodine, endosulfan (RD), epoxiconazole, ethephon, ethoprophos, etofenprox, famoxadone, fenamiphos (RD), fenazaquin, fenbuconazole, fenbutatin oxide, fenoxycarb, fenpropathrin, fenpropimorph (RD), fenpyroximate, fenthion (RD), fipronil (RD), fluazifop-P-butyl (RD), flubendiamide, fluopyram (RD), fluquinconazole, flusilazole (RD), flutriafol, folpet (RD), formetanate, glyphosate, haloxyfop-R (RD), heptachlor (RD), hexaconazole, indoxacarb, lindane, linuron, malathion (RD), mepiquat, metaflumizone, metalaxyl, methamidophos, methidathion, methiocarb (RD), methoxyfenozide, monocrotophos, myclobutanil (RD), oxadixyl, paclobutrazol, penconazole, pendimethalin, permethrin, phoxim, pirimicarb (RD), pirimiphos-methyl, procymidone (RD), profenofos, propamocarb, propiconazole, prothioconazole (RD), pymetrozine, pyraclostrobin, pyrethrins, pyridaben, pyriproxyfen, spiromesifen, spiroxamine (RD), tau-fluvalinate, tebufenpyrad, tefluthrin, terbuthylazine, tetraconazole, thiamethoxam (RD), thiophanate-methyl, triadimenol (RD) and triticonazole). According to the current scientific knowledge, the presence of these pesticides in the food products assessed was not likely to pose a short-term health risk to consumers.

For 27 pesticides, the screening for potential short-term consumer risks was positive for at least one sample for one or several of the food products in focus, meaning that the estimated short-term exposure exceeded the ARfD (i.e. captan (RD), carbendazim (RD), carbofuran (RD), carbosulfan, chlorfenvinphos, chlormequat, chlorpropham (RD), chlorpyrifos, deltamethrin, dichlorvos, dieldrin (RD), fenarimol, fenvalerate (RD), flonicamid (RD), fosthiazate, imazalil, imidacloprid, lambda-cyhalothrin, methomyl (RD), oxamyl, phenthoate, phosmet (RD), prochloraz (RD), tebuconazole (RD), thiabendazole (RD), thiacloprid and triazophos). In addition, the calculated exposure exceeded the toxicological reference values for one or several commodities in three of the five dithiocarbamates scenarios as well as for the dimethoate and omethoate-scenario.

	Food product [a]											
Pesticide	**Or**	**Ma**	**Pe**	**Po**	**Ca**	**Cu**	**Sp**	**Be**	**Ri**	**Wf**	**Li**	**Pm**
2,4-D (RD)	10.8	5.27										
2-phenylphenol[b]												
Abamectin (RD)			1.82			29.2		2.27				
Acephate								1.20	1.26			
Acetamiprid (RD)	1.00	0.53	36.4		1.27	42.5	31.6	5.45	1.51			
Acrinathrin	85.1	15.6				27.5	4.07	3.40				
Aldicarb (RD)												
Amitraz (RD)	37.1		54.6					1.59				
Amitrole												
Azinphos-ethyl												
Azinphos-methyl			18.2									
Azoxystrobin[b]												
Benfuracarb												
Bifenthrin	22.1	7.05	3.04			3.90		0.87				
Biphenyl[c]		1.47					0.24	0.45	0.10			
Bitertanol												
Boscalid (RD)[b]												
Bromide ion[b]												
Bromopropylate[c]									0.42			
Bromuconazole									2.27			
Bupirimate[b]												
Buprofezin	0.13	0.07	0.36					0.11	0.29			
Captan (RD)	0.66		137			0.45		0.08				
Carbaryl									1.89			
Carbendazim (RD)	89.5	39.7	505	30.8	34.9	44.2	90.4	22.7	8.19	0.51		
Carbofuran (RD)		482						1,437				
Carbosulfan	225											
Chlorantraniliprole[b]												
Chlordane (RD)[c]												9.40
Chlorfenapyr	28.3	0.74	0.61		4.23	56.1						
Chlorfenvinphos[c]					2,790							
Chlormequat			598						0.43	7.64		
Chlorobenzilate[c]											0.61	
Chlorothalonil (RD)	0.20	1.02	2.58			9.65	3.31	2.46				
Chlorpropham (RD)	1.80	0.28	0.58	245	2.41	0.14	0.08	0.10				
Chlorpyrifos	23.9	16.7	1,075	1,599	1,047	316	85.9	65.8	161	10.7		
Chlorpyrifos-methyl	29.2	18.4	15.5						0.76	8.77		

Pesticide	**Or**	**Ma**	**Pe**	**Po**	**Ca**	**Cu**	**Sp**	**Be**	**Ri**	**Wf**	**Li**	**Pm**
Clofentezine (RD)[b]												
Clothianidin			5.74	3.84	0.70	0.94	3.73		0.06			
Cyfluthrin	13.3		22.8				15.8	2.27		2.96		
Cymoxanil		0.95				4.39						
Cypermethrin	19.9	2.09	18.7	0.77		1.73	15.8	2.33	0.50	0.35		
Cyproconazole					6.97	12.3		2.21	0.95			
Cyprodinil (RD)[b]												
Cyromazine				58.4	6.34			2.04				
DDT (RD)[b]												
Deltamethrin	26.5	6.68	118				271	22.7	193	46.2		
Diazinon		3.78									0.90	
Dichlofluanid[c]												
Dichlorprop (RD)	0.29	0.22										
Dichlorvos						241						
Dicloran			3.64									
Dicofol	0.03	0.15						0.05	0.19			
Dicrotophos												
Dieldrin (RD)					655	117					0.02	
Diethofencarb[b]												
Difenoconazole	0.83	1.04	25.6	0.10	7.57	11.0	2.83	1.28	0.20	0.10		
Diflubenzuron (RD)[b]												
Dimethoate (RD) - dimethoate	24.1	14.8	574		52.6	98.4	120	295				
Dimethoate (RD) - omethoate	121	74.0	2,869		263	492	602	1,475				
Dimethomorph	1.96	0.02		0.26	0.32	1.27	1.46					
Diniconazole[d]							*					
Diphenylamine[b]												
Dithianon			29.6									
Dithiocarbamates (RD) - maneb sc	102	19.7	215	138	10.4	19.7	41.1	30.9		1.62		
Dithiocarbamates (RD) - mancozel	33.5	6.44	70.3	45.1	3.39	6.42	13.4	10.1		0.53		
Dithiocarbamates (RD) - propineb	213	40.9	447	287	21.5	40.8	85.3	64.2		3.35		
Dithiocarbamates (RD) - thiram sc	29.7	5.71	62.3	40.0	3.00	5.69	11.9	8.96		0.47		
Dithiocarbamates (RD) - ziram sce	282	54.3	592	380	28.5	54.1	113	85.1		4.44		
Dodine	0.66	0.17	30.1				0.36					
Endosulfan (RD)			17.0			31.2	2.56	5.29				
Endrin[c]												
EPN												
Epoxiconazole							1.87		2.74	3.02		

Pesticide	Or	Ma	Pe	Po	Ca	Cu	Sp	Be	Ri	Wf	Li	Pm
Ethephon	37.1		8.92									
Ethion[c]												
Ethirimol												
Ethoprophos								1.25				
Etofenprox	9.15	2.34	1.18			0.08	7.68	0.10				
Famoxadone						4.27						
Fenamidone												
Fenamiphos (RD)					33.7							
Fenarimol	21.2	3.90	107									
Fenazaquin	5.84	2.62	1.37	3.08		3.10		2.95				
Fenbuconazole	0.57											
Fenbutatin oxide	33.2	31.7	4.55		0.13	1.40						
Fenhexamid[b]												
Fenitrothion												
Fenoxycarb			0.73							0.07		
Fenpropathrin	84.0	14.5	3.64									
Fenpropidin (RD)												
Fenpropimorph (RD)		0.19			2.11		0.83					
Fenpyroximate	53.0	8.07	16.8			5.85		0.91				
Fenthion (RD)		62.9										
Fenvalerate (RD)	227	12.7						6.35				
Fipronil (RD)			19.2	8.54	1.41	32.5		8.32				
Flonicamid (RD)		73.5	0.73	33.8		204	8.41	4.99				
Fluazifop-P-butyl (RD)				63.3	22.0		35.9	3.07				
Flubendiamide			11.8			2.11		1.13				
Fludioxonil[b]												
Flufenoxuron[b]												
Fluopyram (RD)		0.04	3.46	0.18	0.53	1.08	0.21	0.61				
Fluquinconazole			18.7									
Flusilazole (RD)			20.0						5.04			
Flutriafol	12.7	9.24			5.07	4.91		0.07	3.03			
Folpet (RD)				1.31		0.63	20.8					
Formetanate						15.2						
Formothion												
Fosthiazate				163								
Glufosinate (RD)												
Glyphosate	0.69		0.55							0.61		

Pesticide	Or	Ma	Pe	Po	Ca	Cu	Sp	Be	Ri	Wf	Li	Pm
Haloxyfop-R (RD)								0.09				
Heptachlor (RD)[c]												25.2
Hexachlorobenzene[d]											*	
Hexachlorocyclohexane (alpha)[d]											*	
Hexachlorocyclohexane (beta)											*	*
Hexaconazole[c]								27.2	13.4			
Hexythiazox[b]												
Imazalil	178	61.5	698	39.6	5.45	4.21	0.63			0.43		
Imidacloprid	84.0	17.6	39.5	589	8.45	12.7	12.8	3.03	1.68			
Indoxacarb			5.83			1.40	21.7	0.50				
Ioxynil (RD)												
Iprodione (RD)[b]												
Iprovalicarb[b]												
Isocarbophos												
Isofenphos-methyl												
Isoprocarb												
Kresoxim-methyl (RD)[b]												
Lambda-cyhalothrin	66.3	50.1	104		12.7	59.8	76.8	136				
Lindane											0.00	
Linuron				10.3	35.9		3.69					
Lufenuron[b]												
Malathion (RD)	9.42	6.84	0.30					0.14	1.85			
Maleic hydrazide (RD)[b]												
Mandipropamid[b]												
Mepanipyrim (RD)												
Mepiquat			6.73							0.60		
Meptyldinocap (RD)												
Metaflumizone								3.67				
Metalaxyl	0.58	0.16	1.09	1.26	1.52	2.11	0.07	0.04	0.04			
Metazachlor												
Metconazole												
Methamidophos								27.2	27.3			
Methidathion	6.76	0.22	7.29									
Methiocarb (RD)					1.46	21.6	40.0	9.13	3.88			
Methomyl (RD)						164	39.8	90.8				
Methoxychlor[c]												
Methoxyfenozide	11.2	0.83	14.1				15.8					

Pesticide	Or	Ma	Pe	Po	Ca	Cu	Sp	Be	Ri	Wf	Li	Pm
Metobromuron												
Monocrotophos								51.1	1.26			
Myclobutanil (RD)	0.86	0.52	0.88		0.61	0.77	0.01	0.15				
Nitenpyram												
Oxadixyl[(c)]					8.88							
Oxamyl						2,924						
Oxydemeton-methyl (RD)												
Paclobutrazol			7.29					0.15				
Parathion												
Parathion-methyl (RD)												
Penconazole	1.72		0.47		0.36	0.23		0.05				
Pencycuron[(b)]												
Pendimethalin					2.11		0.14	0.04			0.01	
Permethrin				0.06			0.02		0.04	0.26		
Phenthoate[(c)]	703								6.30			
Phosalone												
Phosmet (RD)	41.3	13.4	156									
Phoxim[(c)]								53.2				
Pirimicarb (RD)	6.37	4.90	7.01			6.43	42.9	0.52				
Pirimiphos-methyl	41.6	0.59		11.3					30.4	9.63		0.01
Prochloraz (RD)	1,008	706		6.15				0.77	0.15			
Procymidone (RD)	1.11			2.56	52.8	3.41		20.8				
Profenofos	0.13	0.15						0.08	0.03			
Propamocarb				3.66	2.79	30.5	51.1	0.62				
Propargite[(d)]	*	*	*									
Propiconazole	2.25	0.46	0.79	1.03	0.42			0.28	0.50			
Propoxur[(c)]												
Propyzamide (RD)[(b)]												
Prothioconazole (RD)					21.6							
Prothiofos[(d)]	*											
Pymetrozine						25.8	0.27	2.16				
Pyraclostrobin	11.9	0.92	86.2	6.66	11.8	4.09	90.0	0.76				
Pyrazophos[(c)]												
Pyrethrins	2.52						0.11	0.07	3.98	1.47		
Pyridaben	7.69	13.4	3.82			17.5	0.93	12.3				
Pyrimethanil[(b)]												
Pyriproxyfen	0.29	0.09	0.07	0.05				0.01				
Quinoxyfen[(b)]												
Resmethrin[(c)]												
Rotenone												
Spinosad[(b)]												
Spirodiclofen[(b)]												
Spiromesifen						0.15		0.01				
Spiroxamine (RD)			2.82				0.05	0.03		0.01		
tau-Fluvalinate	13.0	8.24	0.18				43.4	0.41				
Tebuconazole (RD)	2.48	42.8	103	1.54	20.7	83.8	0.53	1.13	12.6	0.19		
Tebufenozide[(b)]												
Tebufenpyrad	92.8	20.3	4.55	7.69				3.74	0.19			
Teflubenzuron[(b)]												
Tefluthrin					55.8				3.03			
Terbuthylazine	9.95	13.2					10.5					
Tetraconazole			0.73		1.39		0.45	0.54				
Tetradifon[(b)]												
Tetramethrin[(d)]	*							*	*	*		
Thiabendazole (RD)	92.8	24.5	257	323	4.44	2.11	0.70	0.31				
Thiacloprid	0.44		85.0		3.80	102		2.65				
Thiametoxam (RD)	0.29		1.35	1.47	0.20	1.64	0.96	0.59	0.25			
Thiophanate-methyl	3.85		23.2			2.46	0.88	2.27				
Tolclofos-methyl[(b)]												
Tolylfluanid (RD)												
Topramezone												
Triadimenol (RD)			1.46		1.90	9.59		3.18				
Triazophos								79.4	126			
Trichlorfon												
Trifloxystrobin (RD)[(b)]												
Triflumuron[(b)]												
Trifluralin[(b)]												
Triticonazole			1.27									
Vinclozolin (RD)												
Zoxamide[(b)]												

(a): Be: beans with pods, Ca: carrots, Cu: Cucumber, Ma: mandarins, Or: oranges, Pe: pears, Po: Potatoes, Sp: spinach, Ri: rice, Wf: wheat flour, Li: liver of ruminants, swine and poultry, Pm: poultry meat
(b): No ARfD necessary due to low acute toxicity
(c): Acute risk assessment was performed with the ADI, since no ARfD is available for the active substance.
(d): No ADI/ARfD allocated, but detectable residues in one or several commodities. See exposure assessment in Table 14

Figure 62: Results of short-term (acute) dietary risk assessment (expressed as a percentage of the toxicological reference value)

Overall, 355 determinations (corresponding to 346 samples) were calculated to exceed the ARfD in the risk assessment screening.[48] The detailed results of the short-term dietary exposure assessment for the pesticide residues detected in the 12 food products covered by the 2014 EU-coordinated control programme, including the 355 cases with an exceedance of the ARfD, are presented in Appendix D, Figure 63 to Figure 74. In these charts, the results for the individual samples containing residues above the LOQ are presented individually, expressing the exposure as percentage of the ARfD. The blue dots refer to results reported under the EU-coordinated programme, whereas the orange dots refer to findings in samples that were analysed in the framework of the national control programmes. The figures in brackets next to the name of the pesticides represent the number of samples with residues below the LOQ, number of samples with detectable residues below the MRL, and the number of samples with residues above the MRL. The highest number of exceedance of the ARfD was identified for pears (234 determinations), followed by potatoes (28 determinations), carrots (25 determinations), and oranges (23 determinations). For the other commodities, less than 20 determinations exceeded the toxicological threshold (i.e. 100% of the ARfD/ADI).

Among the cases exceeding the ARfD, in 62 cases the toxicological thresholds were only slightly exceeded (less than 120% of the ARfD).

182 determinations exceeding the ARfD were related to chlorpyrifos residues (139 determinations in pears, 22 in carrots, 16 in potatoes, 4 in cucumbers and 1 in rice). A substantial number of exceedances of the ARfD were also identified for imazalil (74 cases in pears and 4 in oranges), prochloraz (15 determinations in oranges and mandarins, respectively) and thiabendazole (11 determinations in pears and one in potatoes)[49]. It should be noted that the ARfD for chlorpyrifos and thiabendazole have been lowered in 2014. Thus, the retrospective risk assessment was performed with the most up-to-date toxicological reference values not yet in place in 2014. For the remaining active substances, less than 10 samples contained residues exceeded the ARfD.

The 12 highest results for the exposure calculation, expressed as percentage of the ARfD, were calculated for the following samples: a sample of cucumbers from Portugal (containing oxamyl residues accounting for 2900% of the ARfD), French carrots with chlorfenvinphos residues (2800% of the ARfD), potatoes from Greece and Malta with chlorpyrifos residues (1600% and 890% of the ARfD), beans with pods from Cambodia with carbofuran (yard long beans, 1400% of the ARfD), Spanish pears with chlorpyrifos (1100% of the ARfD), Greek carrots with chlorpyrifos (1050% of the ARfD), prochloraz in Argentinian oranges (1000% of the ARfD), three samples of Italian pears with chlorpyrifos (between 840% and 980% of the ARfD) and one sample of Hungarian pears with chlorpyrifos (800% of the ARfD). For the remaining samples, the calculated exposure was below 800% of the ARfD.

It should be stressed again that the results reflect the outcome of a conservative screening for potential risks. The calculations were performed without taking into account that the residues expected in the food consumed after processing or washing might be significantly lower. Given the conservatism of the calculations and the frequency of exceedances of the ARfD, EFSA concludes that the probability of being exposed to pesticide residues exceeding concentrations that may lead to negative health outcomes was low.

For 7 pesticides (diniconazole, hexachlorobenzene, hexachlorocyclohexane (alpha), hexachlorohexane (beta), propargite, prothiofos and tetramethrin), measurable residues were detected, but due to the absence of toxicological reference values no short-term dietary risk assessment could be performed. None of these pesticides are authorised in the EU. The estimated short-term exposure to these pesticides, using the food consumption data of EFSA PRIMo rev. 2 is presented in Table 14.

[48] As regards the two compounds where no unambiguous risk assessment could be calculated (i.e. dimethoate (RD) and dithiocarbamates (RD)) the dimethoate and the mancozeb scenario were used as the basis for calculating the number of determinations/samples exceeding the ARfD.

[49] Imazalil and thiabendazole are two pesticides that are frequently used for post-harvest treatment, e.g. in pears or citrus fruit. For the acute risk assessment the standard variability factors were used. Considering that a lower unit-to-unit variability may be expecpted, the acute risk assessment is likely to overestimate the real exposure.

Table 14: Results of short-term exposure assessment for active substances without ARfD/ADI values

Pesticide	Food product	Short-term exposure (in µg/kg bw)
Diniconazole	Spinach	0.45
Hexachlorobenze	Liver	0.002
Hexachlorocyclohexane (alpha)	Liver	0.001
Hexachlorocyclohexane (beta)	Liver	0.013
	Poultry meat	0.035
Propargite	Oranges	23.9
	Mandarins	41.7
	Pears	1.8
Prothiofos	Oranges	3.8
Tetramethrin	Oranges	1.1
	Beans (with pods)	0.33
	Rice	0.11
	Wheat (flour)	0.12

For the following pesticide/crop combinations exceedances of the ARfD were noted although the samples did not exceed the MRL in place in 2014 (the numbers in brackets refer to the numbers of samples exceeding the ARfD but considered compliant with the MRL):

- Chlorpyrifos in pears (133), potatoes (5) and carrots (4);
- Imazalil in pears (73);
- Prochloraz (RD) in mandarins (15) and oranges (13);
- Thiabendazole (RD) in pears (11) and potatoes (1);
- Chlorpropham (RD) in potatoes (6);
- Deltamethrin in rice (6);
- Lambda-cyhalothrin in pears (1);
- Carbofuran (RD) in mandarins (1);
- Tebuconazole (RD) in pears (1);
- Fenarimol in pears (1);
- Methomyl (RD) in cucumbers (1) and
- Phenthoate in oranges (1).

Thus, these findings give an indication that the MRLs in place in 2014 were not sufficiently protective for consumers and that corrective measures to lower the MRLs have to be considered. For pesticides listed above where the toxicological reference values have been recently lowered (i.e. chlorpyrifos, thiabendazole, lambda-cyhalothrin), such corrective measures have been taken by reviewing the existing MRLs (the review process has been initiated or has been already completed). For chlorpyrifos[50], following the revision of the toxicological reference values, the MRLs were screened by EFSA for possible consumer health risks (EFSA, 2015c) and where considered necessary the MRLs were lowered.[51] Thus, the MRLs currently in place for pears and potatoes are set at substantially lower levels compared to the MRLs in place in 2014. A detailed review of the existing MRLs for chlorpyrifos is currently ongoing. Following the lowering of toxicological reference values for lambda-cyhalothrin (EFSA, 2015g), EFSA has, based on a refined risk assessment, derived recommendations to modify the existing MRL for pears (EFSA, 2015g). Similarly, EFSA re-assessed the MRLs for thiabendazole in

50 The toxicological properties of chlorpyrifos were re-assessed by EFSA (EFSA, 2014a) and resulted in a new ARfD proposal which was 20 times lower than the ARfD set by the European Commission in consultation with the Member States in 2005 (European Commission, 2005)

51 Commission Regulation (EU) 2016/60 of 19 January 2016 amending Annexes II and III to Regulation (EC) No 396/2005 of the European Parliament and of the Council as regards maximum residue levels for chlorpyrifos in or on certain products. OJ L 14, 21.1.2016, p. 1–17.

2016, deriving proposals for lower MRLs for a number of commodities, among others also for potatoes and pears (EFSA, 2016c).

MRLs of deltamethrin, carbofuran (RD), tebuconazole, fenarimol and methomyl (RD) were subject to comprehensive, periodic reviews under Article 12 of Regulation (EC) No 396/2005; the MRLs for the commodities listed above that were identified as being not sufficiently protective for European consumers were recently lowered. The MRL review is ongoing for imazalil, prochloraz and chlorpropham. For phenthoate, MRLs are listed in Regulation (EC) No 396/2005 for a limited number of crops (i.e. seed spices), but not for oranges.[52] Risk managers may consider the need for setting specific MRLs for phenthoate for all commodities covered by Regulation (EC) No 396/2005 at a level that is sufficiently protective for consumers.

EFSA concludes that efficient mechanisms are in place to take corrective measures for cases where new assessments lead to the lowering of toxicological reference values. In addition, the periodic review of existing MRLs in the framework of Article 12 of Regulation (EC) No 396/2005 is an important instrument that allows identifying and, where necessary, modifying existing MRLs that are not fully protective for European consumers.

5.2. Long-term (chronic) risk assessment – individual pesticides

The chronic or long-term exposure assessment estimates the expected exposure of an individual consumer over a long period, predicting the lifetime exposure. The underlying model assumptions for the long-term risk assessment are explained in detail in the 2010 and 2011 EU reports on pesticide residues (EFSA, 2013a, 2014b).

The exposure calculations are based on the most commonly consumed food commodities, i.e. the food products covered by the three years' cycle of the EU-coordinated monitoring programme.

In contrast to previous years, EFSA calculated two scenarios referred to as adjusted upper-bound and lower-bound approach[53]. The adjusted upper-bound risk assessment methodology should be considered as a conservative screening, which is likely to overestimate the real exposure. Higher tier calculations could be performed, e.g. by means of probabilistic modelling, using distributions for food consumption data and distributions for residue concentrations. Additional elements for refined exposure calculations could be included in both deterministic and probabilistic risk assessment models. EFSA has developed a methodology for probabilistic calculations (EFSA, 2008, 2009, 2012c, 2013b) and currently discussions are on-going concerning the practical implementation. However, as long as the conservative screening does not identify an exceedance of the toxicological reference values, no further assessments are considered necessary. The lower-bound approach is based on assumptions that may underestimate the exposure to a certain extent; however, the calculations are useful to complement the adjusted upper-bound exposure assessments to understand better the uncertainties of the calculations, which are mainly resulting from the high percentage of samples with residues at or below the LOQ.

For the adjusted upper-bound approach and lower-bound, the residue concentration used as the input value in the chronic exposure estimations was derived according to the following approach:

- For each pesticide/crop combination, an overall mean value was calculated, using the residue concentrations measured in the individual surveillance samples. For samples with residues below the LOQ, EFSA used as a conservative assumption the numerical value of the LOQ to calculate the overall mean (adjusted upper-bound approach);
- If no positive findings were reported for any of the samples analysed for a given pesticide/crop combination (i.e. all results were reported below the LOQ), the contribution of these crops to the total dietary intake was not considered, assuming a 'no use/no residue' situation (adjusted upper bound approach);

52 The EU MRL legislation does not contain specific MRLs for phenthoate, except for seed spices. Although the sample contained residues at the level of 0.159 mg/kg, thus, clearly exceeding the default MRL of 0.01 mg/kg, the sample was not considered exceeding the legal limit.

53 In previous years, only the scenario described as "upper-bound approach" was calculated. Thus, for comparing results of the 2014 exposure calculations with the results of previous years, the results described as upper-bound approach need to be taken into account.

- In the lower bound approach, the results below the LOQ are replaced with zero, postulating that no measurable residues of the pertinent pesticide were present in the sample;
- For the food products covered by the 2014 EU-coordinated monitoring programme (i.e. beans with pods, carrots, cucumbers, mandarins, oranges, pears, potatoes, spinach, rice, wheat flour, liver, poultry muscle/fat), the mean residue concentration was calculated from the results presented in Section 3.3 of this report;
- All the results reported for liver samples (bovine, goat, sheep, swine and poultry liver) were pooled to calculate the mean residue concentrations. The exposure was assessed on the basis of the consumption of bovine liver;
- For poultry meat and swine meat the following approach was used:
    - For fat-soluble pesticides, the exposure was calculated assuming the poultry meat contained 10% of the residue measured in poultry fat, postulating a fat content of 10% for poultry meat.
    - For non-fat soluble pesticides, the exposure was calculated with the residue concentration measured in muscle.
- For the remaining food products considered in the long-term exposure assessment, the residue input figures were derived from the results of the 2014 national programmes. This applies to apples, peaches, table grapes, wine grapes, strawberries, bananas, tomatoes, peppers, aubergines, broccoli, cauliflower, head cabbage, lettuce, peas (without pods), leek, olive oil, oats, rye, swine meat, milk and chicken eggs;
- For swine meat, a similar approach as described for poultry meat was used to calculate the input value for the long-term risk assessment. However, the default fat content of swine meat was assumed to be 20%;
- Results concerning samples analysed with analytical methods for which the LOQ was greater than the corresponding MRL were disregarded;
- The residue values reported according to the residue definition for enforcement (in accordance with the EU MRL legislation) were not recalculated to the residue definition for risk assessment, lacking a comprehensive list of conversion factors;

The toxicological reference values used for the risk assessment are reported in Appendix D, Table 20 and in the Appendix of the 2013 EU report on pesticide residues (EFSA, 2015c).

Since the residue definition for dimethoate contains two compounds with significantly different toxicities (i.e. dimethoate and omethoate), it is not possible to perform an unambiguous risk assessment.[54] Thus, for this compound EFSA calculated two scenarios: the optimistic dimethoate scenario where it is assumed that the calculated mean residue concentrations are related only to the less toxic dimethoate, while in the pessimistic omethoate scenario the total residue concentration reported is assumed to refer to the more toxic omethoate.

In addition, the residue definitions for fenvalerate, methomyl and triadimenol contain compounds with different toxicities. To perform the chronic risk assessment, it was assumed that the residues found are related to the use of the authorised substance only (esfenvalerate, methomyl and triadimenol, respectively).

For dithiocarbamates, five scenarios were calculated, assuming that the measured CS_2 concentration refers exclusively to maneb, mancozeb, propineb, thiram or ziram.

[54] Some reporting countries reported the results for dimethoate and omethoate separately. However, as long as the individual concentrations of the two compounds are not reported for all samples, reliable input values for dimethoate and omethoate cannot be calculated separately. Following discussions with the data providers, it was agreed that in future the individual results for dimethoate and omethoate will be reported.

5.2.1. Results of the long-term (chronic) risk assessment – individual pesticides

The results for the long-term dietary exposure assessments for each pesticide (adjusted upper-bound and lower-bound scenario) are reported in Table 15. The results are expressed as percentage of the ADI.

Table 15: Results of long-term dietary risk assessment

Pesticide	Long-term exposure (in % of ADI)	
	Adjusted upper-bound	Lower-bound
2,4-D (RD)	0.42	0.22
2-phenylphenol	0.25	0.13
Abamectin (RD)	2.08	0.02
Acephate	0.07	0.00
Acetamiprid (RD)	0.98	0.18
Acrinathrin	1.61	0.00
Aldicarb (RD)	n.d.	n.d.
Amitraz (RD)	2.97	0.10
Amitrole	n.d.	n.d.
Azinphos-ethyl*	detectable residues in one or several commodities	
Azinphos-methyl	5.05	0.00
Azoxystrobin	0.24	0.06
Benfuracarb	n.d.	n.d.
Bifenthrin	1.77	0.06
Biphenyl	0.11	0.00
Bitertanol	5.67	0.21
Boscalid (RD)	1.85	1.10
Bromide ion	1.22	0.57
Bromopropylate	0.12	0.00
Bromuconazole	0.11	0.00
Bupirimate	0.39	0.01
Buprofezin	2.67	0.18
Captan (RD)	1.01	0.74
Carbaryl	1.85	0.01
Carbendazim (RD)	1.69	0.23
Carbofuran (RD)	28.33	0.09
Carbosulfan	1.03	0.00
Chlorantraniliprole	0.02	0.00
Chlordane (RD)	3.28	0.02
Chlorfenapyr	0.53	0.00
Chlorfenvinphos	5.47	0.11
Chlormequat	2.67	2.40
Chlorobenzilate	0.05	0.00
Chlorothalonil (RD)	2.15	0.11
Chlorpropham (RD)	3.03	2.48
Chlorpyrifos	53.87	22.46
Chlorpyrifos-methyl	3.40	0.50
Clofentezine (RD)	0.41	0.02
Clothianidin	0.21	0.00
Cyfluthrin	11.34	0.07
Cymoxanil	0.35	0.00
Cypermethrin	1.08	0.05
Cyproconazole	0.99	0.00
Cyprodinil (RD)	1.68	0.54
Cyromazine	0.40	0.01
DDT (RD)	2.05	0.06

Pesticide	Long-term exposure (in % of ADI)	
	Adjusted upper-bound	Lower-bound
Deltamethrin	4.58	0.27
Diazinon	18.30	0.03
Dichlofluanid	n.d.	n.d.
Dichlorprop (RD)	0.07	0.00
Dichlorvos	21.01	0.04
Dicloran	0.30	0.00
Dicofol	3.38	0.04
Dicrotophos	detectable residues in one or several commodities	
Dieldrin (RD)	72.70	1.38
Diethofencarb	0.02	0.00
Difenoconazole	3.57	0.13
Diflubenzuron (RD)	0.16	0.01
Dimethoate (RD) - dimethoate	24.29	0.71
Dimethoate (RD) - omethoate	80.96	2.37
Dimethomorph	0.68	0.17
Diniconazole*	detectable residues in one or several commodities	
Diphenylamine	0.44	0.14
Dithianon	4.01	2.16
Dithiocarbamates (RD) - maneb scenario	7.57	1.97
Dithiocarbamates (RD) - mancozeb scenario	7.85	2.04
Dithiocarbamates (RD) - propineb scenario	54.92	14.25
Dithiocarbamates (RD) - thiram scenario	36.61	9.50
Dithiocarbamates (RD) - ziram scenario	73.22	19.00
Dodine	0.52	0.18
Endosulfan (RD)	3.43	0.01
Endrin	1.29	0.01
EPN*	n.d.	n.d.
Epoxiconazole	1.59	0.01
Ethephon	1.56	0.38
Ethion	0.36	0.00
Ethirimol	0.42	0.01
Ethoprophos	2.73	0.00
Etofenprox	0.76	0.09
Famoxadone	1.44	0.18
Fenamidone	0.15	0.00
Fenamiphos (RD)	3.92	0.06
Fenarimol	0.88	0.00
Fenazaquin	4.56	0.02
Fenbuconazole	3.54	0.03
Fenbutatin oxide	0.97	0.09

Pesticide	Long-term exposure (in % of ADI)	
	Adjusted upper-bound	Lower-bound
Fenhexamid	0.21	0.05
Fenitrothion	2.26	0.00
Fenoxycarb	0.39	0.01
Fenpropathrin	0.31	0.01
Fenpropidin (RD)	0.70	0.02
Fenpropimorph (RD)	3.86	0.06
Fenpyroximate	2.31	0.04
Fenthion (RD)	1.88	0.23
Fenvalerate (RD)	0.49	0.03
Fipronil (RD)	39.91	1.79
Flonicamid (RD)	1.25	0.08
Fluazifop-P-butyl (RD)	1.28	0.05
Flubendiamide	0.99	0.01
Fludioxonil	0.16	0.07
Flufenoxuron	0.62	0.02
Fluopyram (RD)	2.17	0.59
Fluquinconazole	7.13	0.01
Flusilazole (RD)	7.94	0.01
Flutriafol	2.60	0.05
Folpet (RD)	1.01	0.74
Formetanate	1.10	0.06
Formothion*	n.d.	n.d.
Fosthiazate	1.52	0.02
Glufosinate (RD)	0.18	0.00
Glyphosate	0.13	0.02
Haloxyfop-R (RD)	4.02	0.06
Heptachlor (RD)	9.32	0.05
Hexachlorobenzene*	detectable residues in one or several commodities	
Hexachlorocyclohexane (alpha)*	detectable residues in one or several commodities	
Hexachlorocyclohexane (beta)*	detectable residues in one or several commodities	
Hexaconazole	0.35	0.01
Hexythiazox	0.76	0.01
Imazalil	17.16	15.86
Imidacloprid	0.54	0.06
Indoxacarb	3.56	0.28
Ioxynil (RD)	n.d.	n.d.
Iprodione (RD)	1.26	0.63
Iprovalicarb	0.48	0.06
Isocarbophos*	n.d.	n.d.
Isofenphos-methyl*	n.d.	n.d.
Isoprocarb*	n.d.	n.d.
Kresoxim-methyl (RD)	0.02	0.00
Lambda-cyhalothrin	12.21	0.58
Lindane	1.88	0.00
Linuron	3.57	0.18
Lufenuron	0.86	0.09
Malathion (RD)	1.32	0.93
Maleic hydrazide (RD)	4.33	2.47
Mandipropamid	0.05	0.01
Mepanipyrim (RD)	0.21	0.03
Mepiquat	0.14	0.06
Meptyldinocap (RD)	0.31	0.01
Metaflumizone	0.68	0.01
Metalaxyl	0.40	0.04
Metazachlor	0.18	0.00
Metconazole	n.d.	n.d.
Methamidophos	1.62	0.04
Methidathion	17.03	0.11
Methiocarb (RD)	1.37	0.01
Methomyl (RD)	6.62	0.03
Methoxychlor	0.10	0.00
Methoxyfenozide	0.24	0.04
Metobromuron	n.d.	n.d.
Monocrotophos	2.45	0.04
Myclobutanil (RD)	1.23	0.15
Nitenpyram*	n.d.	n.d.
Oxadixyl	0.44	0.00
Oxamyl	3.48	0.09
Oxydemeton-methyl (RD)	n.d.	n.d.
Paclobutrazol	0.60	0.00
Parathion	n.d.	n.d.
Parathion-methyl (RD)	n.d.	n.d.
Penconazole	0.83	0.03
Pencycuron	0.06	0.00
Pendimethalin	0.15	0.00
Permethrin	0.86	0.01
Phenthoate	1.44	0.02
Phosalone	0.12	0.00
Phosmet (RD)	2.31	0.15
Phoxim	2.24	0.01
Pirimicarb (RD)	0.71	0.14
Pirimiphos-methyl	9.11	5.61
Prochloraz (RD)	3.10	0.24
Procymidone (RD)	4.16	0.02
Profenofos	0.21	0.01
Propamocarb	0.19	0.13
Propargite*	detectable residues in one or several commodities	
Propiconazole	1.11	0.28
Propoxur	0.02	0.00
Propyzamide (RD)	0.30	0.00
Prothioconazole (RD)	1.06	0.00
Prothiofos*	detectable residues in one or several commodities	
Pymetrozine	0.17	0.02
Pyraclostrobin	1.28	0.33
Pyrazophos	0.17	0.00
Pyrethrins	1.18	0.02
Pyridaben	2.78	0.03
Pyrimethanil	0.95	0.74
Pyriproxyfen	0.14	0.01
Quinoxyfen	0.08	0.00
Resmethrin	0.05	0.00
Rotenone*	n.d.	n.d.
Spinosad	0.89	0.16
Spirodiclofen	1.55	0.10

Pesticide	Long-term exposure (in % of ADI)	
	Adjusted upper-bound	Lower-bound
Spiromesifen	0.57	0.05
Spiroxamine (RD)	0.66	0.03
tau-Fluvalinate	4.54	0.03
Tebuconazole (RD)	1.28	0.13
Tebufenozide	0.74	0.01
Tebufenpyrad	2.46	0.05
Teflubenzuron	0.86	0.00
Tefluthrin	0.58	0.01
Terbuthylazine	5.34	0.01
Tetraconazole	5.74	0.14
Tetradifon	n.d.	n.d.
Tetramethrin*	detectable residues in one or several commodities	
Thiabendazole (RD)	1.46	1.15
Thiacloprid	2.83	0.28
Thiamethoxam (RD)	1.07	0.02
Thiophanate-methyl	0.38	0.01

Pesticide	Long-term exposure (in % of ADI)	
	Adjusted upper-bound	Lower-bound
Tolclofos-methyl	0.07	0.00
Tolylfluanid (RD)	0.13	0.00
Topramezone	n.d.	n.d.
Triadimenol (RD)	0.49	0.01
Triazophos	3.66	0.04
Trichlorfon	0.58	0.00
Trifloxystrobin (RD)	0.26	0.04
Triflumuron	1.10	0.02
Trifluralin	0.17	0.00
Triticonazole	0.16	0.00
Vinclozolin (RD)	0.89	0.00
Zoxamide	0.01	0.00

* Active substance for which no ADI was established
n.d.: No detectable residues in any of the samples analysed

For 19 pesticides, no quantifiable residues were reported in any of the crops/food products considered in the chronic exposure assessment; these pesticides are aldicarb (RD), amitrole, benfuracarb, dichlofluanid, EPN, formothion, ioxynil (RD), isocarbophos, isofenphos-methyl, isoprocarb, metconazole, metobromuron, nitenpyram, oxydemeton-methyl, parathion, parathion-methyl (RD), rotenone, tetradifon and topramezone. Thus, in these cases the long-term dietary exposure related to the commodities covered by the EUCP (three year's cycle) was negligible.

In the upper-bound scenario of the exposure calculation, the long-term exposure amounted to less than 10% of the ADI for 172 pesticides. EFSA concludes that due to the high safety margin, no long-term consumer health risk is expected for these pesticides.

The estimated exposure of the upper-bound scenario was in a range between 10% and 100% of the ADI for the following 11 pesticides (ranked in ascending order of the exposure): cyfluthrin (RD), lambda-cyhalothrin, methidathion, imazalil, diazinon, dichlorvos, dimethoate (RD), carbofuran, fipronil (RD), chlorpyrifos and dieldrin (RD)). The long-term exposure calculated for the dimethoate, omethoate, thiram, propineb and ziram fall in this category as well. Considering the overall conservative approach in the dietary exposure calculations, according to the current scientific knowledge, these pesticides were not likely to pose a consumer health concern although consumers were exposed to a certain extent to these compounds via residues in food.

For most pesticides, the estimated exposure was significantly lower in the lower-bound scenario compared to the upper-bound approach, which gives an indication on the high conservatism of the risk assessment methodology used. For pesticides with a significant difference between the upper-bound and lower-bound approach, the calculated exposure in the upper-bound scenario was mainly driven by results at the LOQ.

For ten pesticides (azinphos-ethyl, dicrotophos, diniconazole, ethirimol, hexachlorobenzene, hexachlorocyclohexane (alpha), hexachlorocyclohexane (beta), propargite, prothiofos and tetramethrin), measurable residues were detected in food but no long-term dietary risk assessment could be performed as there are no internationally agreed toxicological reference values available for these compounds. None of these pesticides is approved in Europe but residues may be present in food due to either persistence of the pesticides in the environment or due to their use in third countries. The estimated exposure to these pesticides, using the food consumption data of EFSA PRIMo rev. 2, was low (see Table 16).

Table 16: Results of long-term exposure assessment for active substances without ADI values

Pesticide	Long-term exposure (in µg/kg bw per day)	
	Upper-bound approach	**Lower-bound approach**
Azinphos-ethyl	0.0056	<0.001
Dicrotophos	0.0169	<0.001
Diniconazole	0.0162	<0.001
Hexachlorobenzene	0.1181	0.0017
Hexachlorocyclohexane (alpha)	0.0536	<0.001
Hexachlorocyclohexane (beta)	0.0560	0.0034
Propargite	0.3127	0.0286
Prothiofos	0.0371	<0.001
Tetramethrin	0.1833	<0.001

Overall, based on the results of the 2014 monitoring programmes (EUCP and NP), it is concluded that long-term dietary exposure to those pesticides covered by the EU coordinated monitoring programme for which toxicological data are available was unlikely to pose a health risk to consumers. For the ten pesticides without reliable toxicological assessments where detectable residues were reported sporadically, a consumer health concern cannot be fully excluded, but considering the inherent conservatism of the calculation and the low exposure estimates the health risk was considered to be low.

6. Conclusions and recommendations

Overall, based on the analysis of the design of the EU-coordinated monitoring programme, EFSA concludes that the control system implemented for pesticide residues in food is efficient and fit for the purpose, i.e. to derive an overview on the residue situation in food consumed by European citizens. The EU-coordinated programme covers in a three-year's cycle the food products that are the major constituents of the European diets (EFSA, 2015b). The pesticides that have to be analysed on a mandatory basis in the framework of the EU-coordinated programme cover the most relevant compounds currently expected to contribute to the dietary exposure.

For further improvements of the efficiency of the EU-coordinated control programme, risk managers should consider the following recommendations:

- In the past, the choice of food products included in the EU-coordinated control programme was mainly driven by considerations regarding the importance of a product in human diet, i.e. the importance of food products for chronic exposure. The scope of the EU-coordinated control programme could be extended to other food products, such as small fruits and berries (gooseberries, currants), grapefruit, rucola, apricots, celeriac, Brussels sprouts, cherries and tea. Although these food products are not necessarily major food commodities in terms of the long-term exposure, they were identified as containing frequently pesticide residues and have a potential to result in significant short-term intake.
- If risk managers decide to include tea as a new commodity in the EUCP, the pesticides to be analysed should take into account that frequently non-authorised pesticides were found in national monitoring programmes.
- Taking into account that in food of animal origin pesticide residues were found only sporadically with a very limited number of pesticides was detected (mainly persistent environmental pollutants), the analytical scope and the number of samples for this product group could be reduced. As regards the pesticides to be analysed in animal products, EFSA supports that a substantial number of pesticides has been eliminated from the list of the EUCP for 2015 and the following years. Whereas a continued monitoring of persistent substances is appropriate to generate the necessary data basis needed to adapt the legal limits periodically to reflect the decreasing environmental concentrations, the pesticides that have not been detected in previous monitoring programmes and that are not used on animal feed should be removed from the EU-coordinated monitoring programme.
- Instead of analysing the pesticide residues in animal products, risk managers should discuss to shift the monitoring focus to animal feed. Although the EU pesticide residue legislation does not yet contain legal limits for products that are exclusively used for feed purpose, a number of products covered by Annex I of Regulation (EC) No 396/2005 is used for food and feed purpose and would therefore be relevant candidates for being included in the EUCP, e.g. soybeans, rape seed or barley.
- The pesticides to be tested in the feed products proposed in the previous bullet point should take into account the specific uses in these crops. A mandatory analysis of glyphosate in the three crops mentioned should generate the necessary information to get a better understanding on the actual exposure of livestock, not only to estimate the possible carry-over in food of animal origin and the relevance for dietary exposure for humans, but also with regard to animal health.
- Honey is an animal product that was found to contain a number of pesticides that are applied to crops foraged by bees. In addition, substances were detected that may be linked to the use of veterinary medicinal products that are also covered by the EU pesticide legislation. The inclusion of honey in the EUCP should be considered to generate a sound basis to estimate the exposure of bees and to adapt the legal limits for honey in accordance with Article 16 of Regulation (EC) No 396/2005, where needed.
- The following pesticides that repeatedly were found exceeding the legal limits in the framework of the national control programmes should be considered to be added to the EUCP: fosetyl-Al (RD), anthraquinone, BAC, DDAC (RD), isoprothiolane, dinotefuran; bendiocarb, spinetoram.

- For the following pesticides, no infringements were identified, but considering the relatively high detection rate, they may result in a significant dietary burden to qualify them as candidates for the EU-coordinated monitoring programmes: spirotetramat, metrafenone, tricyclazole, etoxazole, bifenazate, ametoctradin, fluopicolide, trimethyl-sulfonium cation.
- If processed products will be included in future EU-coordinated monitoring programmes, a list of processing factors derived from processing studies should be made available to Member States. Providing a list of agreed processing factors would facilitate the MRL enforcement and allow a harmonised approach for the risk assessment.

The national control programmes were found to be very diverse in their strategic focus. Overall, they provide an impressive amount of information on the pesticide residues in food placed on the European market. EFSA noted a significant improvement of the data quality in terms of harmonisation of the coding of pesticide residue results in accordance with the guidance document (EFSA, 2015e). The consistent coding of data is a pre-requisite to transfer the pesticide monitoring database to the data warehouse and to find relevant information by means of on-line search tools.

One of the major objectives of this report is to share the findings on infringements identified by the different Member States not only with risk managers responsible for the national control programmes, but also with the interested public and with all partners who have responsibilities in the food chain, in particular with food business operators. The findings of non-compliant food samples in previous control programmes should help to target future control activities towards food products, which have a higher probability to be non-compliant. The report gives information to enhance efficiency of self-control systems to implement the legal obligations imposed by the general food law. Efficient strategies to identify at an early stage food products that potentially violate the EU food safety standards will reduce non-compliant food being placed on the market and will have an effect on the dietary exposure of European consumers to pesticide residues.

The findings of the national control programmes, in particular the MRL exceedances, should be also used to shape future official control activities to make them more efficient. In particular, national risk managers should consider the following recommendations:

- Food products with elevated MRL exceedance rates should be included in the national control programmes with a sampling frequency reflecting the importance of the products in terms of consumption and trade volume. In addition to the commodities proposed in the first recommendation (small fruits and berries (gooseberries, currants), grapefruit, rucola, apricots, celeriac, Brussels sprouts, cherries, tea, soybeans, rape seed, barley and honey) the following crops should be considered to be included in national control programmes: dry beans, fresh herbs such as parsley or celery leaves, tropical fruit such as guavas, passion fruits, lychees, turnips or dried wild fungi.
- Member States should ensure that the national control programmes cover the pesticides most frequently exceeding the legal limits. Where necessary the analytical scope of the enforcement laboratories should be extended to ensure that non-compliant samples are identified reliably, regardless in which Member State the sample is analysed.

The following specific follow-up activities are recommended by EFSA, taking into account the results of the detailed data analysis presented in Section 4:

- The presence of multiple residues is not considered to be a reason for non-compliance with MRL legislation as long as the individual pesticide does not exceed the respective legal limits. However, food products with multiple residues should be assessed carefully by the competent authorities in view of possible violations of provisions of Regulation (EC) No 396/2005. The concerned products may be a result of practices that are not in line with Article 20 of the aforementioned regulation (e.g. mixing of lots with the purpose of diluting the residues). Equally, the presence of multiple residues may give an indication that the principles of good plant protection practice were not respected (application of several pesticides with a similar mode of action with the purpose to avoid using single pesticides at dose rates that would lead to exceedances of the MRL).

- A relatively low number of infringements related to non-approved pesticides were identified in food products produced in the EU/EEA. This implies that the information on the expiry of approvals of pesticides is efficiently communicated to European farmers, producers of horticultural products, food business operators responsible for storage of food products and that the control system for of the use of pesticides is covering this aspect sufficiently. In contrast, repeated MRL violations for non-approved substances were noted for food imported from third countries. Although third countries are officially informed on modifications of EU MRLs via the SPS system, apparently, food business operators importing food from third countries are not sufficiently aware of the legal requirements in the EU and the scope of the EU pesticide legislation that also covers products that are not considered as pesticides in other parts of the world. The EU pesticides database of the European Commission provides a valuable source of information on the MRLs applicable in the EU. However, it may be appropriate to offer an additional service for users of the database, i.e. to develop specific reports that give an overview which MRLs have changed within a certain reference period. A transparent communication of changed MRLs may help to increase the MRL compliance, in particular for products imported from third countries.
- Whereas MRL violations for non-approved pesticides were not identified as a major concern, MRL exceedances were noted for a number of approved pesticides (e.g. chlorpyrifos in carrots, potatoes and other crops, dimethoate in cherries, radishes, apples, iprodione in celeriac, lettuce, spinach, apples, folpet in table grapes, carbendazim in different crops, dithiocarbamates in products like spinach). These findings suggest that authorised plant protection products were not used in accordance with the approved Good Agricultural Practices. Member States should identify the reasons for the non-compliances and take corrective measures.
- Copper residues above the legal limits were identified in food of animal origin (mainly liver) and in infant and follow-on formulae. These residues are not necessarily resulting from the use of copper containing pesticides in feed crops, but could also stem from other sources, e.g. the use of copper as a feed supplement, from the natural copper content of animal products or copper added as nutrient to food covered by the baby foods legislation. The MRLs for copper compounds are currently re-evaluation. In this review, other possible sources of copper residues need to be taken into account to derive appropriate legal limits for the different food products.
- The applicability of the default MRL of 0.01 mg/kg for naturally occurring substances for baby foods should be clarified.
- The source for fosetyl-Al residues exceeding the legal limit in food for infants and young children should be further investigated and appropriate measures need to be taken to avoid MRL non-compliance.
- A number of products from certain third countries were subject to an increased level of controls at the border under Regulation (EC) No 669/2009. Comparing the results for import controls submitted to EFSA with the results summarised in the report published by the European Commission on increased checks on import of food of non-animal origin, EFSA noted discrepancies regarding the number of samples analysed and the number of MRL exceedances. A closer collaboration between EFSA and the European Commission service responsible for the import controls should be established to exchange information and identify the need for corrective measures, e.g. improvement of the coding of samples to avoid discrepancies.

Based on the results of the chronic or long-term exposure assessment, it was concluded that residues of the pesticides covered by the EUCP, according to the current scientific knowledge, are not likely to pose a long-term consumer health risk.

For a number of samples a potential acute or short-term consumer health risk could not be excluded. However, given the conservatism of the calculations, EFSA concluded that the probability of being exposed to pesticide residues exceeding concentrations that may lead to negative health outcomes was low. EFSA also noted that efficient mechanisms are in place to take corrective measures for pesticides where new assessments lead to the lowering of toxicological reference values requiring an adaptation of the legal limits. The MRL review process under Article 12 of Regulation (EC) No 396/2005 is also an important instrument that allows identifying and, where necessary, modifying existing MRLs that are not fully protective for European consumers.

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Abbreviations

EU/EEA country codes

AT	Austria	**IS**	Iceland
BE	Belgium	**IT**	Italy
BG	Bulgaria	**LT**	Lithuania
CY	Cyprus	**LU**	Luxembourg
CZ	Czech Republic	**LV**	Latvia
DE	Germany	**MT**	Malta
DK	Denmark	**NL**	Netherlands
EE	Estonia	**NO**	Norway
EL	Greece	**PL**	Poland
ES	Spain	**PT**	Portugal
FI	Finland	**RO**	Romania
FR	France	**SE**	Sweden
HR	Croatia	**SI**	Slovenia
HU	Hungary	**SK**	Slovak Republic
IE	Ireland	**UK**	United Kingdom

Other abbreviations

ADI	Acceptable Daily Intake
ARfD	Acute Reference Dose
BAC	Benzalkonium Chloride
CAG	Cumulative Assessment Group
CS_2	Carbon disulphide
DDAC	Didecyldimethylammonium chloride
EC	European Commission
EEA	European Economic Area
EFSA	European Food Safety Authority
EFTA	European Free Trade Association
EU	European Union
EUCP	EU-coordinated programme
EURL	European Union Reference Laboratory
FAO	Food and Agriculture Organization of the United Nations
FYRM	The Former Yugoslav Republic of Macedonia
GAP	Good Agricultural Practice
HCH	Hexachlorocyclohexane
HRM	Highest Residue Measured
LOD	Limit of Detection
LOQ	Limit of Quantification
MRL	Maximum Residue Level
NP	National control programme
PRIMo	Pesticide Residue Intake Model
RD	Residue Definition
SSD	Standard Sample Description
WHO	World Health Organization

Appendix A – Authorities responsible in the reporting countries for pesticide residue monitoring

Country	National competent authority	Web address for published national monitoring reports
Austria	Austrian Federal Ministry of Health	https://www.verbrauchergesundheit.gv.at/lebensmittel/lebensmittelkontrolle/monitoring/pestizid.html
	Austrian Agency for Health and Food Safety	http://www.ages.at/ages/ernaehrungssicherheit/rueckstaende-kontaminanten/pflanzenschutzmittel-rueckstaende-in-lebensmittel/pestizidmonitoring/
Belgium	Federal Agency for the Safety of the Food Chain (FASFC)	http://www.afsca.be
Bulgaria	Bulgarian Food Safety Agency	http://www.babh.government.bg
Croatia	Ministry of Agriculture	http://www.mps.hr/
Cyprus	Pesticides Residues Laboratory of the State General Laboratory of Ministry of Health	http://www.moh.gov.cy/sgl
Czech Republic	Czech Agriculture and Food Inspection Authority	http://www.szpi.gov.cz/lstDoc.aspx?nid=11386
	State Veterinary Administration	http://www.svscr.cz
Denmark	Danish Veterinary and Food Administration	http://www.foedevarestyrelsen.dk/fvst_ansvar_opgaver/Sider/Kontrol%20af%20pesticidrester%20i%20fødevarer.aspx
	National Food Institute, Technical University of Denmark	http://www.food.dtu.dk/Publikationer/Kemikaliepaavirkninger/Pesticidrester
Estonia	Veterinary and Food Board	http://www.vet.agri.ee
Finland	Finnish Food Safety Authority Evira and Finnish Customs	http://www.evira.fi/portal/fi/tietoa+evirasta/asiakokonaisuudet/vierasaineet/kasvinsuojeluainejaamat/valvonta/
France	Ministère de l'Économie et des finances. Direction générale de la concurrence, de la consommation et de la répression des fraudes	http://www.economie.gouv.fr/dgccrf/securite/produits-alimentaires
	Ministère de l'Agriculture et de l'Agroalimentaire et de la Foret. Direction générale de l'alimentation	http://agriculture.gouv.fr/dispositif-surveillance-controle-securite-sanitaire-aliments-564
Germany	Federal Office of Consumer Protection and Food Safety (BVL)	www.bvl.bund.de/berichtpsm
Greece	Ministry of Rural Development and Food	http://www.minagric.gr/index.php/en/citizen-menu/foodsafety-menu
	General Directorate of Sustainable Plant Produce Directorate of Plant Produce Protection Department of Plant Protection Products & Biocides	http://www.minagric.gr/index.php/el/for-farmer-2/crop-production/fytoprostasiamenu/ypoleimatafyto
Hungary	National Food Chain Safety Office	https://www.nebih.gov.hu
Iceland	Food and Veterinary Authority. The Environmental and Public Health office in Reykjavik	http://www.mast.is
Ireland	Department of Agriculture, Food and the Marine	www.pcs.agriculture.gov.ie
Italy	Ministry of Health	http://www.salute.gov.it/portale/temi/p2_5.jsp?lingua=italiano&area=fitosanitari&menu=vegetali
Latvia	Ministry of Agriculture Food and Veterinary Service of Latvia	www.zm.gov.lv
Lithuania	National Food and Veterinary Risk Assessment Institute	http://www.nmvrvi.lt

Country	National competent authority	Web address for published national monitoring reports
Luxembourg	Food Safety Service	http://www.securite-alimentaire.public.lu/organisme/pcnp/sc/cs9_prod_phyto/ppp_residus_pesticides/index.html
	Administration of Veterinary Services	
Malta	Malta Competition and Consumer Affairs Authority	www.mccaa.org.mt
Netherlands	Netherlands Food and Consumer Product Safety Authority (NVWA)	www.nvwa.nl
Norway	Norwegian Food Safety Authority	http://www.mattilsynet.no/mat_og_vann/uonskede_stofferimaten/rester_av_plantevernmidler_i_mat/lavt_innhold_av_plantevernmiddelrester_i_maten_i_2014.20205 http://www.mattilsynet.no/planter_og_dyrking/plantevernmidler/rapport_rester_av_plantevernmidler_i_naeringsmidler_2014.20206/binary/Rapport:%20Rester%20av%20plantevernmidler%20i%20n%C3%A6ringsmidler%202014
Poland	The State Sanitary Inspection	http://www.gis.gov.pl
Portugal	Direção Geral de Alimentação e Veterinária (DGAV)	http://www.dgv.min-agricultura.pt/portal/page/portal/DGV/genericos?generico=4217393&cboui=4217393
Romania	National Sanitary Veterinary and Food Safety Authority	http://www.ansvsa.ro
	Ministry of Agriculture and Rural Development	http://www.madr.ro
	Ministry of Health	-
Slovakia	State Veterinary and Food Administration of the Slovakian Republic	http://www.svps.sk/
	Public Health Authority of the Slovakian Republic	
Slovenia	Administration of the Republic of Slovenia for Food Safety, Veterinary Sector and Plant Protection	http://www.uvhvvr.gov.si/si/delovna_podrocja/ostanki_pesticidov/porocila/
Spain	Spanish Agency for Consumer Affairs, Food Safety and Nutrition	http://aesan.msssi.gob.es/AESAN/web/control_oficial/seccion/planes_nacionales_especificos.shtml
Sweden	National Food Agency	www.livsmedelsverket.se
United Kingdom	Health and Safety Executive – Chemicals Regulation Directorate	http://www.pesticides.gov.uk/guidance/industries/pesticides/advisory-groups/PRiF/PRiF-archive/2014/2014_Survey_Details

Appendix B – Background information and detailed results of the EU-coordinated programme

Table 17: Description of the 2014 EU-coordinated control programme

Pesticide	Type of food analysed[(a)]	Residue definition according to Regulation (EC) No 396/2005 on EU MRLs[(b)]	Analysis mandatory for the following food products[(c)]
2,4-D (RD)	P	2,4-D (sum of 2,4-D and its esters expressed as 2,4-D); 2,4-D (sum of 2,4-D, its salts, its esters and its conjugates, expressed as 2,4-D) (PA)	Ma, Or
2-phenylphenol	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Abamectin (RD)	P	Abamectin (sum of avermectin B1a, avermectinB1b and delta-8,9 isomer of avermectin B1a)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Acephate	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Acetamiprid (RD)	P	Acetamiprid (P) Acetamiprid and IM-2-1 metabolite (A)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Acrinathrin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Aldicarb (RD)	P	Aldicarb (sum of aldicarb, its sulfoxide and its sulfone, expressed as aldicarb)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Amitraz (RD)	P	Amitraz (amitraz including the metabolites containing the 2,4 -dimethylaniline moiety expressed as amitraz) [(d)]	Pe
Amitrole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Azinphos-ethyl	A		Li, Pm, Pf
Azinphos-methyl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Azoxystrobin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Benfuracarb	P		
Bifenthrin	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Biphenyl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Bitertanol	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Boscalid (RD)	P	Boscalid (P)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Bromide ion	P		Ri
Bromopropylate	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Bromuconazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Bupirimate	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Buprofezin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Captan (RD)	P	Captan; Captan/Folpet (sum) for beans;	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Carbaryl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Carbendazim (RD)	PA	Carbendazim and benomyl (sum of benomyl and carbendazim expressed as carbendazim) (P); Carbendazim and thiophanate-methyl, expressed as carbendazim (A)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Carbofuran (RD)	P	Carbofuran (sum of carbofuran and 3-hydroxy-carbofuran expressed as carbofuran)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Carbosulfan	P		
Chlorantraniliprole	P		
Chlordane (RD)	A	Chlordane (sum of cis- and trans-isomers and oxychlordane expressed as chlordane)	Li, Pm, Pf
Chlorfenapyr	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf

Pesticide	Type of food analysed[(a)]	Residue definition according to Regulation (EC) No 396/2005 on EU MRLs[(b)]	Analysis mandatory for the following food products[(c)]
Chlorfenvinphos	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Chlormequat	PA		Ca, Pe, Ri, Wf
Chlorobenzilate	A		
Chlorothalonil (RD)	P	Chlorothalonil	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Chlorpropham (RD)	P	Chlorpropham; Chlorpropham (chlorpropham and 3-chloroaniline, expressed as chlorpropham)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Chlorpyrifos	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Chlorpyrifos-methyl	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Clofentezine (RD)	P	Clofentezine (sum of all compounds containing the 2-chlorobenzoyl moiety expressed as clofentezine) (cereals), Clofentezine (other P)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Clothianidin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Cyfluthrin	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Cymoxanil	P		
Cypermethrin	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Cyproconazole	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Cyprodinil (RD)	P	Cyprodinil	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Cyromazine	P		
DDT (RD)	A	DDT (sum of p,p´-DDT, o,p´-DDT, p-p´-DDE and p,p´-TDE (DDD) expressed as DDT)	Li, Pm, Pf
Deltamethrin	PA	Deltamethrin (cis-deltamethrin)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Diazinon	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Dichlofluanid	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Dichlorprop (RD)	A	Dichloprop (sum of dichlorprop (including dichlorprop-P) and its conjugates, expressed as dichlorprop)	
Dichlorvos	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Dicloran	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Dicofol	P	Dicofol (sum of p, p' and o,p' isomers)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Dicrotophos	P		Be
Dieldrin (RD)	A	Aldrin and Dieldrin (Aldrin and dieldrin combined expressed as dieldrin)	Li, Pm, Pf
Difenoconazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Difenoconazole	P		
Diflubenzuron (RD)	P	Diflubenzuron	
Dimethoate (RD)	P	Dimethoate (sum of dimethoate and omethoate expressed as dimethoate)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Dimethomorph	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Diniconazole	P		
Diphenylamine	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Dithianon	P		

Pesticide	Type of food analysed[(a)]	Residue definition according to Regulation (EC) No 396/2005 on EU MRLs[(b)]	Analysis mandatory for the following food products[(c)]
Dithiocarbamates (RD)	P	Dithiocarbamates (dithiocarbamates expressed as CS2, including maneb, mancozeb, metiram, propineb, thiram and ziram)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Dodine	P		
Endosulfan (RD)	PA	Endosulfan (sum of alpha- and beta-isomers and endosulfan-sulphate expresses as endosulfan)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Endrin	A		Li, Pm, Pf
EPN	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Epoxiconazole	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Ethephon	P		Ma, Or, Ri, Wf
Ethion	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Ethirimol	P		
Ethoprophos	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Etofenprox	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Famoxadone	PA		
Fenamidone	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenamiphos (RD)	P	Fenamiphos (sum of fenamiphos and its sulphoxide and sulphone expressed as fenamiphos)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenarimol	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Fenazaquin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Fenbuconazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenbutatin oxide	P		Ma, Or, Pe
Fenhexamid	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenitrothion	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenoxycarb	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenpropathrin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenpropimorph (RD)	A	Fenpropidin (sum of fenpropidin and CGA289267 expressed as fenpropidin) (A)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Fenpropimorph (RD)	PA	Fenpropimorph	
Fenpyroximate	P		
Fenthion (RD)	PA	Fenthion (fenthion and its oxygen analogue, their sulfoxides and sulfone expressed as parent)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Fenvalerate (RD)	PA	Fenvalerate (any ratio of constituent isomers (RR, SS, RS & SR) including esfenvalerate) Fenvalerate (sum of fenvalerate (any ratio of constituent isomers including esfenvalerate) and CPIA (chlorophenyl isovaleric acid), expressed as fenvalerate)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Fipronil (RD)	P	Fipronil (sum Fipronil and sulfone metabolite (MB46136) expressed as Fipronil)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Flonicamid (RD)	P	Flonicamid (sum of flonicamid, TNFG and TNFA)	
Fluazifop-P-butyl (RD)	P	Fluazifop-P-butyl (fluazifop acid (free and conjugate))	Be, Ca, Po, Sp
Flubendiamide	P		
Fludioxonil	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Flufenoxuron	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf

Pesticide	Type of food analysed[(a)]	Residue definition according to Regulation (EC) No 396/2005 on EU MRLs[(b)]	Analysis mandatory for the following food products[(c)]
Fluopyram (RD)	PA	Fluopyram (P); Fluopyram (sum fluopyram and fluopyram-benzamide (M25) expressed as fluopyram) (A)	
Fluquinconazole	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Flusilazole (RD)	PA	Flusilazole (P), Flusilazole (sum of flusilazole and its metabolite IN-F7321 ([bis-(4-fluorophenyl)methyl]silanol) expressed as flusilazole) (A)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Flutriafol	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Folpet (RD)	P	Folpet (beans), Captan/Folpet (sum)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Formetanate	P	Formetanate (Sum of formetanate and its salts expressed as formetanate(hydrochloride))	
Formothion	P		
Fosthiazate	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Glufosinate (RD)	A	Glufosinate-ammonium (sum of glufosinate, its salts, MPP and NAG expressed as glufosinate equivalents)	
Glyphosate	PA		Wf
Haloxyfop-R (RD)	PA	Haloxyfop including haloxyfop-R (Haloxyfop-R methyl ester, haloxyfop-R and conjugates of haloxyfop-R expressed as haloxyfop-R)	Be, Ca, Po, Sp
Heptachlor (RD)	A	Heptachlor (sum of heptachlor and heptachlor epoxide expressed as heptachlor)	Li, Pm, Pf
Hexachlorobenzene	A		Li, Pm, Pf
Hexachlorocyclohexane (alpha)	A		Li, Pm, Pf
Hexachlorocyclohexane (beta)	A		Li, Pm, Pf
Hexaconazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Hexythiazox	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Imazalil	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Imidacloprid	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Indoxacarb	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Ioxynil (RD)	A	Ioxynil, including its esters expressed as ioxynil	
Iprodione (RD)	P	Iprodione	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Iprovalicarb	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Isocarbophos	P		
Isofenphos-methyl	P		
Isoprocarb	P		
Kresoxim-methyl (RD)	P	Kresoxim-methyl	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Lambda-cyhalothrin	P	Lambda-Cyhalothrin	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Lindane	A		Li, Pm, Pf
Linuron	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Lufenuron	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Malathion (RD)	P	Malathion (sum of malathion and malaoxon expressed as malathion)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Maleic hydrazide (RD)	A	Maleic hydrazide	
Mandipropamid	P		

Pesticide	Type of food analysed[(a)]	Residue definition according to Regulation (EC) No 396/2005 on EU MRLs[(b)]	Analysis mandatory for the following food products[(c)]
Mepanipyrim (RD)	P	Mepanipyrim (Mepanipyrim and its metabolite (2-anilino-4-(2-hydroxypropyl)-6-methylpyrimidine) expressed as mepanipyrim) Mepanipyrim	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Mepiquat	PA		Pe, Ri, Wf
Meptyldinocap (RD)	P	Meptyldinocap (sum of 2,4 DNOPC and 2,4 DNOP expressed as meptyldinocap)	
Metaflumizone	A		
Metalaxyl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Metazachlor	A		
Metconazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Methamidophos	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Methidathion	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Methiocarb (RD)	P	Methiocarb (sum of methiocarb and methiocarb sulfoxide and sulfone, expressed as methiocarb)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Methomyl (RD)	P	Methomyl and thiodicarb (sum of methomyl and thiodicarb expressed as methomyl)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Methoxychlor	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Methoxyfenozide	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Metobromuron	P		
Monocrotophos	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Myclobutanil (RD)	P	Myclobutanil	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Nitenpyram	P		Be, Cu,
Oxadixyl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Oxamyl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Oxydemeton-methyl (RD)	P	Oxydemeton-methyl (sum of oxydemeton-methyl and demeton-S-methylsulfone expressed as oxydemeton-methyl)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Paclobutrazol	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Parathion	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Parathion-methyl (RD)	PA	Parathion-methyl (sum of Parathion-methyl and paraoxon-methyl expressed as Parathion-methyl)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Penconazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pencycuron	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pendimethalin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Permethrin	A		Li, Pm, Pf
Phenthoate	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Phosalone	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Phosmet (RD)	P	Phosmet (phosmet and phosmet oxon expressed as phosmet)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Phoxim	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pirimicarb (RD)	P	Pirimicarb (sum of Pirimicarb and desmethyl pirimicarb expressed as Pirimicarb)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pirimiphos-methyl	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf

Pesticide	Type of food analysed[(a)]	Residue definition according to Regulation (EC) No 396/2005 on EU MRLs[(b)]	Analysis mandatory for the following food products[(c)]
Prochloraz (RD)	PA	Prochloraz (sum of prochloraz and its metabolites containing the 2,4,6-Trichlorophenol moiety expressed as prochloraz)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Procymidone (RD)	P	Procymidone	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Profenofos	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Propamocarb	P		Be, Ca, Cu, Ma, Or, Po
Propargite	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Propiconazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Propoxur	P		
Propyzamide (RD)	P	Propyzamide	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Prothioconazole (RD)	PA	Prothioconazole (Prothioconazole-desthio) (P); Prothioconazole (sum of prothioconazole-desthio and its glucuronide conjugate, expressed as prothioconazole-desthio) (A)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Prothiofos	P		
Pymetrozine	P		Cu
Pyraclostrobin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pyrazophos	A		Li, Pm, Pf
Pyrethrins	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pyridaben	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pyrimethanil	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Pyriproxyfen	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Quinoxyfen	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Resmethrin	A		Li, Pm, Pf
Rotenone	P		
Spinosad	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Spirodiclofen	P		
Spiromesifen	P		
Spiroxamine (RD)	PA	Spiroxamine (P), Spiroxamine carboxylic acid expressed as spiroxamine (A)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
tau-Fluvalinate	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Tebuconazole (RD)	PA	Tebuconazole (P); Tebuconazole (sum of tebuconazole, hydroxy-tebuconazole, and their conjugates, expressed as tebuconazole)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Tebufenozide	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Tebufenpyrad	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp,
Teflubenzuron	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Tefluthrin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Terbuthylazine	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Tetraconazole	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Tetradifon	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Tetramethrin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Thiabendazole (RD)	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Thiacloprid	P	Thiabendazole	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Thiamethoxam (RD)	PA	Thiamethoxam (sum of thiamethoxam and clothianidin expressed as thiamethoxam)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Thiophanate-methyl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Tolclofos-methyl	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf

Pesticide	Type of food analysed[(a)]	Residue definition according to Regulation (EC) No 396/2005 on EU MRLs[(b)]	Analysis mandatory for the following food products[(c)]
Tolylfluanid (RD)	P	Tolylfluanid (Sum of tolylfluanid and dimethylaminosulfotoluidide expressed as tolylfluanid)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp
Topramezone	A		
Triadimenol (RD)	P	Triadimefon and triadimenol (sum of triadimefon and triadimenol)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Triazophos	PA		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf, Li, Pm, Pf
Trichlorfon	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Trifloxystrobin (RD)	P	Trifloxystrobin (P)	
Triflumuron	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Trifluralin	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Triticonazole	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf
Vinclozolin (RD)	P	Vinclozolin (sum of Vinclozolin and all metabolites containing the 3,5-dichloraniline moiety, expressed as Vinclozolin)	Be, Ca, Cu, Ma, Or, Pe, Po, Sp,
Zoxamide	P		Be, Ca, Cu, Ma, Or, Pe, Po, Sp, Ri, Wf

(a): P: to be analysed in plant products; A: to be analysed in animal products

(b): Legal residue definition applicable in 2014 for the relevant food products covered by the EUCP; if not specifically mentioned, the residue definition comprises the parent compound only

(c): Be: beans with pods, Ca carrots, Cu: Cucumber, Ma: mandarins, Or: oranges, Pe: pears, Po: Potatoes, Sp: spinach, Ri: rice, Wf: wheat flour, Li: liver of ruminants, swine and poultry, Pm: poultry muscle; Pf: poultry fat

(d): According to Regulation (EU) No 788/2012 It is accepted if amitraz (parent) and its multi-residue-method-amendable metabolites 2,4-dimethyl formanilide (DMF) and N-(2,4-dimethyl-phenyl)-N'-methyl formamide (DMPF) are targeted and reported separately.

Appendix C – Background information and detailed results for national control programmes

Table 18: Scope of pesticide analysis (pesticides sought and detected)

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
1,1-dichloro-2,2-bis(4-ethylphenyl)ethane	4,756	0	5	0.00	No
1,2-Dibromo-3-chloropropane	378	0	2	0.00	No
1-naphthylacetamide	8,799	20	6	0.23	No
1-naphthylacetic acid	3,119	8	2	0.26	No
2,3,5-Trimethacarb	5,666	0	2	0.00	No
2,4,5-T (RD)	1,763	0	5	0.00	No
2,4-D (RD)	17,660	312	21	1.77	Yes
2,4-DB (RD)	12,060	0	12	0.00	No
2-phenylphenol	39,932	959	30	2.40	Yes
3,4,5-Trimethacarb	2,634	0	2	0.00	No
4-CPA	13,281	4	7	0.03	No
6-Benzyladenine	3,392	2	4	0.06	No
8-hydroxyquinoline	5	0	1	0.00	No
Abamectin (RD)	33,319	93	22	0.28	Yes
Acephate	61,276	54	30	0.09	Yes
Acequinocyl	2,751	0	3	0.00	No
Acetamiprid (RD)	60,201	2,064	29	3.43	Yes
Acetochlor	17,460	0	16	0.00	No
Acibenzolar-S-methyl (RD)	16,319	0	12	0.00	No
Acifluorfen	2,091	0	2	0.00	No
Aclonifen	34,451	27	17	0.08	No
Acrinathrin	60,962	93	29	0.15	Yes
Alachlor	26,656	3	17	0.01	No
Alanycarb	4,855	0	3	0.00	No
Aldicarb (RD)	52,988	3	28	0.01	Yes
Aldimorph	146	0	1	0.00	No
Allethrin	11,939	1	9	0.01	No
Allidochlor	2,475	0	2	0.00	No
Ametoctradin (RD)	9,598	28	6	0.29	No
Ametryn	23,692	10	13	0.04	No
Amidithion	2,480	0	1	0.00	No
Amidosulfuron (RD)	13,795	0	9	0.00	No
Aminocarb	12,560	0	9	0.00	No
Aminopyralid	6,464	0	3	0.00	No
Amisulbrom	8,660	0	6	0.00	No
Amitraz (RD)	30,142	28	24	0.09	Yes
Amitrole	2,500	0	7	0.00	Yes
Ancymidol	6,195	0	4	0.00	No
Anilazine	1,192	0	2	0.00	No
Anilofos	4,866	0	3	0.00	No
Anthraquinone	17,890	101	10	0.56	No
Aramite	10	0	1	0.00	No
Aspon	5,758	0	3	0.00	No
Asulam	12,384	2	8	0.02	No
Atraton	3,467	0	5	0.00	No
Atrazine	43,410	7	24	0.02	No
Azaconazole	21,032	0	14	0.00	No
Azadirachtin	10,159	18	8	0.18	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Azafenidin	437	0	1	0.00	No
Azamethiphos	10,097	0	9	0.00	No
Azimsulfuron	6,616	0	7	0.00	No
Azinphos-ethyl	52,780	1	29	0.00	Yes
Azinphos-methyl	63,777	10	30	0.02	Yes
Aziprotryne	5,784	0	5	0.00	No
Azoxybenzene	1,690	0	1	0.00	No
Azoxystrobin	65,922	3,649	30	5.54	Yes
BAC (RD)	8,427	132	7	1.57	No
Barban	1,136	0	1	0.00	No
Beflubutamid	11,777	0	13	0.00	No
Benalaxyl	40,516	8	18	0.02	No
Benazolin	2,450	0	2	0.00	No
Bendiocarb	21,749	6	16	0.03	No
Benfluralin	26,618	0	13	0.00	No
Benfuracarb	34,026	0	24	0.00	Yes
Benfuresate	2,452	0	3	0.00	No
Benodanil	3,304	0	4	0.00	No
Bensulfuron-methyl	4,863	0	7	0.00	No
Bensulide	4,330	0	2	0.00	No
Bensultap	2,013	0	1	0.00	No
Bentazone (RD)	14,446	2	16	0.01	No
Benthiavalicarb	15,445	2	9	0.01	No
Benzoximate	3,286	0	5	0.00	No
Benzoylprop-Ethyl	6,473	0	7	0.00	No
Benzthiazuron	1	0	0	0.00	No
Bifenazate (RD)	31,224	92	13	0.29	No
Bifenox	25,379	1	13	0.00	No
Bifenthrin	68,960	774	29	1.12	Yes
Binapacryl	12,965	0	13	0.00	No
Bioallethrin	1,886	0	5	0.00	No
Bioresmethrin	3,051	0	3	0.00	No
Biphenyl	43,438	31	25	0.07	Yes
Bis(tributyltin) oxide	39	0	1	0.00	No
Bispyribac	4,404	0	5	0.00	No
Bitertanol	59,314	13	30	0.02	Yes
Bixafen (RD)	23,003	16	18	0.07	No
Boscalid (RD)	64,324	6,823	29	10.61	Yes
Bromacil	22,571	2	13	0.01	No
Bromadiolone	164	0	1	0.00	No
Bromfenvinfos	3,461	0	4	0.00	No
Bromfenvinfos-methyl	530	0	2	0.00	No
Bromide ion	1,961	418	20	21.32	Yes
Bromocyclen	5,274	0	4	0.00	No
Bromophos	40,665	1	21	0.00	No
Bromophos-ethyl	52,627	1	25	0.00	No
Bromopropylate	65,409	13	30	0.02	Yes
Bromoxynil (RD)	13,290	0	13	0.00	No
Bromuconazole	53,692	3	29	0.01	Yes
Bupirimate	65,377	244	30	0.37	Yes
Buprofezin	64,614	531	30	0.82	Yes
Butachlor	6,238	0	9	0.00	No
Butafenacil	10,252	0	8	0.00	No
Butamifos	4,963	0	3	0.00	No
Butocarboxim	15,256	0	9	0.00	No
Butoxycarboxim	9,573	0	6	0.00	No
Butralin	17,616	0	11	0.00	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Buturon	1,840	0	2	0.00	No
Butylate	9,323	0	8	0.00	No
Cadusafos	51,858	2	27	0.00	No
Cafenstrole	2,013	0	1	0.00	No
Camphechlor (RD)	254	0	2	0.00	No
Captafol	20,031	0	16	0.00	No
Captan (RD)	39,528	1,305	26	3.30	Yes
Carbaryl	63,509	42	30	0.07	Yes
Carbendazim (RD)	63,112	1,798	28	2.85	Yes
Carbetamide	14,552	0	10	0.00	No
Carbofuran (RD)	59,122	45	26	0.08	Yes
Carbon tetrachloride	256	0	1	0.00	No
Carbophenothion	23,599	0	14	0.00	No
Carbosulfan	35,074	7	28	0.02	Yes
Carboxin	37,574	1	24	0.00	No
Carfentrazone-ethyl	15,007	0	10	0.00	No
Carpropamid	2,099	0	2	0.00	No
Carvone	1,272	0	1	0.00	No
Chinomethionat	31,622	0	20	0.00	No
Chlorantraniliprole	44,341	1,150	24	2.59	Yes
Chlorbenside	7,854	0	11	0.00	No
Chlorbromuron	16,362	1	11	0.01	No
Chlorbufam	9,365	0	8	0.00	No
Chlordane (RD)	29,892	31	25	0.10	Yes
Chlordecone	1,212	9	3	0.74	No
Chlordimeform	4,804	0	9	0.00	No
Chlorethoxyfos	437	0	1	0.00	No
Chlorfenapyr	56,084	211	29	0.38	Yes
Chlorfenethol	1,690	0	1	0.00	No
Chlorfenprop-Methyl	7,987	0	3	0.00	No
Chlorfenson	25,691	1	20	0.00	No
Chlorfenvinphos	65,701	1	30	0.00	Yes
Chlorfluazuron	16,336	14	10	0.09	No
Chlorflurenol	30	0	1	0.00	No
Chlorflurenol-Methyl	30	0	1	0.00	No
Chloridazon	21,083	3	16	0.01	No
Chlorimuron	764	0	3	0.00	No
Chlormephos	20,228	0	16	0.00	No
Chlormequat	8,563	739	26	8.63	Yes
Chlornitrofen	1,136	0	1	0.00	No
Chlorobenzilate	40,165	3	28	0.01	Yes
Chloroneb	5,961	0	8	0.00	No
Chloropropylate	13,160	0	10	0.00	No
Chlorothalonil (RD)	54,504	451	28	0.83	Yes
Chlorotoluron	22,522	0	15	0.00	No
Chloroxuron	15,458	0	16	0.00	No
Chlorpropham (RD)	65,086	610	29	0.94	Yes
Chlorpyrifos	71,875	4,726	30	6.58	Yes
Chlorpyrifos-methyl	71,216	574	30	0.81	Yes
Chlorsulfuron	6,174	0	11	0.00	No
Chlorthal	36	0	2	0.00	No
Chlorthal-dimethyl	38,421	4	19	0.01	No
Chlorthiamid	4,875	0	5	0.00	No
Chlorthion	1,354	0	2	0.00	No
Chlorthiophos	13,808	1	11	0.01	No
Chlozolinate	39,082	0	22	0.00	No
Chromafenozide	11,622	1	6	0.01	No
Cinidon-ethyl	7,123	0	7	0.00	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Cinmethylin	437	0	1	0.00	No
Cinosulfuron	7,837	0	4	0.00	No
Clethodim (RD)	14,881	0	11	0.00	No
Climbazole	2,196	0	1	0.00	No
Clodinafop	9,607	0	6	0.00	No
Cloethocarb	437	0	1	0.00	No
Clofentezine (RD)	52,645	120	27	0.23	Yes
Clomazone	38,602	14	18	0.04	No
Clopyralid	18,887	20	14	0.11	No
Clothianidin	28,618	131	21	0.46	Yes
Copper	2,419	1,866	2	77.14	No
Coumachlor	3,776	0	2	0.00	No
Coumaphos	25,218	8	21	0.03	No
Coumatetralyl	3,858	0	2	0.00	No
Crimidine	3,483	0	5	0.00	No
Crotoxyphos	1,690	0	1	0.00	No
Crufomate	1,644	0	3	0.00	No
Cyanazine	24,320	0	14	0.00	No
Cyanofenphos	13,583	0	14	0.00	No
Cyanophos	13,488	0	7	0.00	No
Cyazofamid	43,678	61	20	0.14	No
Cyclanilide	6,134	0	5	0.00	No
Cycloate	7,691	0	10	0.00	No
Cycloprothrin	78	0	1	0.00	No
Cycloxydim (RD)	14,755	0	13	0.00	No
Cycluron	4,047	0	3	0.00	No
Cyenopyrafen	2,013	0	1	0.00	No
Cyflufenamid	24,417	48	11	0.20	No
Cyflumetofen	7,235	0	4	0.00	No
Cyfluthrin	54,698	97	27	0.18	Yes
Cyhalofop-butyl (RD)	9,206	0	7	0.00	No
Cyhalothrin	1,786	17	5	0.95	No
Cyhalothrin, gamma-	137	0	2	0.00	No
Cyhexatin (RD)	1,231	0	4	0.00	No
Cymiazole	4,059	0	6	0.00	No
Cymoxanil	47,227	40	28	0.08	Yes
Cypermethrin	66,303	1,786	29	2.69	Yes
Cyphenothrin	3,874	0	4	0.00	No
Cyprazin	4,238	0	1	0.00	No
Cyproconazole	61,723	92	29	0.15	Yes
Cyprodinil (RD)	62,754	3,705	29	5.90	Yes
Cyprofuram	855	0	2	0.00	No
Cyromazine	28,632	73	21	0.25	Yes
Cythioate	2,695	0	3	0.00	No
Daimuron	2,105	0	2	0.00	No
Dalapon	2,013	0	1	0.00	No
Daminozide (RD)	1,804	2	4	0.11	No
Dazomet (RD)	2,640	0	2	0.00	No
DDAC	8,550	68	7	0.80	No
DDT (RD)	56,449	469	27	0.83	Yes
Deltamethrin	70,417	877	30	1.25	Yes
Demeton	184	0	1	0.00	No
Demeton-O-methyl	3	0	1	0.00	No
Demeton-S	3,320	0	3	0.00	No
Demeton-S-Methyl	30,671	0	19	0.00	No
Desmedipham	20,739	4	13	0.02	No
Desmetryn	10,296	0	12	0.00	No
Diafenthiuron	28,817	10	16	0.03	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Dialifos	16,169	0	12	0.00	No
Diallate	4,682	0	7	0.00	No
Diazinon	71,654	64	30	0.09	Yes
Dicamba	13,655	2	14	0.01	No
Dichlobenil	31,018	1	17	0.00	No
Dichlofenthion	20,994	9	13	0.04	No
Dichlofluanid	59,035	1	28	0.00	Yes
Dichlone	437	0	1	0.00	No
Dichlorophen	2,899	0	4	0.00	No
Dichlorprop (RD)	24,910	12	17	0.05	Yes
Dichlorvos	63,096	12	29	0.02	Yes
Diclobutrazol	22,675	0	12	0.00	No
Diclofop (RD)	12,946	0	8	0.00	No
Dicloran	60,324	11	29	0.02	Yes
Dicofol	48,662	59	27	0.12	Yes
Dicrotophos	47,958	2	29	0.00	Yes
Dieldrin (RD)	55,259	85	28	0.15	Yes
Dienochlor	1	0	0	0.00	No
Diethatyl	437	0	1	0.00	No
Diethofencarb	56,213	14	29	0.02	Yes
Difenoconazole	63,692	1,709	30	2.68	Yes
Difenoxuron	2,936	0	7	0.00	No
Difenzoquat	1,730	0	2	0.00	No
Diflubenzuron (RD)	48,659	155	27	0.32	Yes
Diflufenican	35,016	1	18	0.00	No
Diflufenzopyr	7,678	0	3	0.00	No
Dikegulac	3,168	1	5	0.03	No
Dimefox	2,404	0	2	0.00	No
Dimefuron	8,811	0	6	0.00	No
Dimepiperate	2,225	0	1	0.00	No
Dimethachlor	16,094	1	13	0.01	No
Dimethenamid–p	12,470	1	9	0.01	No
Dimethipin	2,311	0	3	0.00	No
Dimethirimol	2,603	0	2	0.00	No
Dimethoate (RD)	63,983	493	27	0.77	Yes
Dimethomorph	59,724	1,421	29	2.38	Yes
Dimethylvinphos	4,864	0	4	0.00	No
Dimetilan	2,005	0	2	0.00	No
Dimoxystrobin	32,848	5	20	0.02	No
Diniconazole	56,823	12	28	0.02	Yes
Dinitramine	5,901	0	5	0.00	No
Dinobuton	4,466	0	5	0.00	No
Dinocap (RD)	8,442	0	14	0.00	No
Dinoseb	5,328	0	7	0.00	No
Dinotefuran	28,291	19	17	0.07	No
Dinoterb	5,833	0	7	0.00	No
Dioxabenzofos	3,968	0	5	0.00	No
Dioxacarb	9,647	0	8	0.00	No
Dioxathion	24,013	0	12	0.00	No
Diphenamid	12,102	0	9	0.00	No
Diphenylamine	60,732	114	30	0.19	Yes
Dipropetryn	3,886	0	2	0.00	No
Diquat	642	5	5	0.78	No
Disulfoton (RD)	38,799	0	22	0.00	No
Ditalimfos	23,450	0	15	0.00	No
Dithianon	15,860	303	14	1.91	Yes
Dithiocarbamates (RD)	14,086	1,482	25	10.52	Yes

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Dithiopyr	4,330	0	2	0.00	No
Diuron (RD)	33,137	15	18	0.05	No
DNOC	4,398	0	6	0.00	No
Dodemorph	8,306	0	10	0.00	No
Dodine	32,811	311	23	0.95	Yes
Edifenphos	9,693	0	8	0.00	No
Emamectin	8,784	12	10	0.14	No
Empenthrin	50	0	1	0.00	No
Endosulfan (RD)	68,600	183	29	0.27	Yes
Endrin	48,121	4	29	0.01	Yes
EPN	58,956	0	30	0.00	Yes
Epoxiconazole	61,700	33	30	0.05	Yes
EPTC	10,691	0	11	0.00	No
Esprocarb	4,238	0	1	0.00	No
Etaconazole	10,242	2	9	0.02	No
Ethalfluralin	6,436	0	6	0.00	No
Ethametsulfuron-methyl	4,196	0	6	0.00	No
Ethephon	5,430	226	20	4.16	Yes
Ethidimuron	2,075	0	2	0.00	No
Ethiofencarb	35,448	0	16	0.00	No
Ethion	66,157	28	30	0.04	Yes
Ethiprole	6,037	0	6	0.00	No
Ethirimol	44,411	100	27	0.23	Yes
Ethofumesate (RD)	27,928	4	18	0.01	No
Ethoprophos	64,346	8	29	0.01	Yes
Ethoxyquin	22,298	32	15	0.14	No
Ethoxysulfuron	6,259	0	4	0.00	No
Ethylene oxide (RD)	12	0	2	0.00	No
Etofenprox	56,295	501	30	0.89	Yes
Etoxazole	33,026	107	16	0.32	No
Etridiazole	26,841	5	14	0.02	No
Etrimfos	40,758	0	24	0.00	No
Famoxadone	51,744	204	28	0.39	Yes
Famphur	8,258	0	6	0.00	No
Fenamidone	56,198	58	29	0.10	Yes
Fenamiphos (RD)	49,888	5	27	0.01	Yes
Fenarimol	65,901	14	30	0.02	Yes
Fenazaflor	687	0	1	0.00	No
Fenazaquin	57,939	40	29	0.07	Yes
Fenbuconazole	58,210	267	30	0.46	Yes
Fenbutatin oxide	17,555	84	21	0.48	Yes
Fenchlorphos (RD)	23,291	0	20	0.00	No
Fenfluthrin	149	0	1	0.00	No
Fenfuram	6,547	0	4	0.00	No
Fenhexamid	64,430	1,936	30	3.00	Yes
Fenitrothion	65,698	16	29	0.02	Yes
Fenobucarb	14,094	13	11	0.09	No
Fenothiocarb	7,488	0	6	0.00	No
Fenoxaprop	14,565	1	4	0.01	No
Fenoxaprop-ethyl	437	0	1	0.00	No
Fenoxaprop-P	8,211	0	9	0.00	No
Fenoxaprop-P-Ethyl	8,536	0	9	0.00	No
Fenoxycarb	62,770	93	29	0.15	Yes
Fenpiclonil	17,780	0	10	0.00	No
Fenpropathrin	64,183	128	29	0.20	Yes
Fenpropidin (RD)	37,507	20	25	0.05	Yes
Fenpropimorph (RD)	56,660	89	30	0.16	Yes

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Fenpyrazamine	14	9	1	64.29	No
Fenpyroximate	53,420	140	28	0.26	Yes
Fenson	22,240	0	10	0.00	No
Fensulfothion	21,568	0	18	0.00	No
Fenthion (RD)	56,707	16	28	0.03	Yes
Fentin acetate (RD)	10	0	1	0.00	No
Fentin hydroxide (RD)	397	0	8	0.00	No
Fenuron	8,518	0	11	0.00	No
Fenvalerate (RD)	35,960	68	19	0.19	Yes
Fipronil (RD)	50,346	62	24	0.12	Yes
Flamprop	3,791	0	4	0.00	No
Flamprop-isopropyl	1,950	0	3	0.00	No
Flamprop-methyl	2,949	0	4	0.00	No
Flamprop-M-Isopropyl	2,216	0	3	0.00	No
Flamprop-M-Methyl	437	0	1	0.00	No
Flazasulfuron	11,400	0	10	0.00	No
Flocoumafen	2,576	0	1	0.00	No
Flonicamid (RD)	35,796	262	18	0.73	Yes
Florasulam	14,508	1	13	0.01	No
Fluacrypyrim	5,123	1	5	0.02	No
Fluazifop-P-butyl (RD)	27,154	75	22	0.28	Yes
Fluazinam	36,619	9	20	0.02	No
Fluazuron	4,850	0	2	0.00	No
Flubendiamide	27,830	59	19	0.21	Yes
Flubenzimine	5,552	0	2	0.00	No
Fluchloralin	5,163	0	4	0.00	No
Flucycloxuron	6,974	0	5	0.00	No
Flucythrinate	29,032	0	19	0.00	No
Fludioxonil	61,239	3,554	30	5.80	Yes
Flufenacet (RD)	10,377	0	12	0.00	No
Flufenoxuron	55,860	67	29	0.12	Yes
Flufenzin	1,388	0	2	0.00	No
Flumethrin	1,925	0	4	0.00	No
Flumetralin	12,795	0	8	0.00	No
Flumetsulam	961	0	1	0.00	No
Flumioxazine	14,813	0	8	0.00	No
Fluometuron	7,124	0	8	0.00	No
Fluopicolide	49,604	475	24	0.96	No
Fluopyram (RD)	38,397	888	22	2.31	Yes
Fluorodifen	2,384	0	1	0.00	No
Fluoroimide	1	0	0	0.00	No
Fluotrimazole	10,531	0	4	0.00	No
Fluoxastrobin	25,722	4	15	0.02	No
Flupyrsulfuron-methyl	6,521	0	5	0.00	No
Fluquinconazole	55,895	8	29	0.01	Yes
Flurenol-butyl	437	0	1	0.00	No
Fluridone	1,763	0	2	0.00	No
Flurochloridone	19,905	2	13	0.01	No
Fluroxypyr (RD)	28,406	5	17	0.02	No
Flurprimidole	4,946	0	3	0.00	No
Flurtamone	22,354	0	12	0.00	No
Flusilazole (RD)	61,403	41	28	0.07	Yes
Flusulfamide	5,361	2	2	0.04	No
Fluthiacet-Methyl	836	0	2	0.00	No
Flutolanil	47,106	14	25	0.03	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Flutriafol	59,234	406	30	0.69	Yes
Fluvalinate	6,115	0	7	0.00	No
Fluxapyroxad	14,706	1	10	0.01	No
Folpet (RD)	31,928	76	24	0.24	Yes
Fomesafen	10,205	2	5	0.02	No
Fonofos	34,446	0	21	0.00	No
Foramsulfuron	6,721	0	6	0.00	No
Forchlorfenuron	18,722	14	13	0.07	No
Formetanate	34,912	36	21	0.10	Yes
Formothion	38,152	0	27	0.00	Yes
Fosetyl-Al (RD)	3,174	1,023	4	32.23	No
Fosthiazate	47,710	8	28	0.02	Yes
Fosthietan	1	0	0	0.00	No
Fuberidazole	17,739	2	14	0.01	No
Furalaxyl	22,733	0	12	0.00	No
Furathiocarb	41,899	1	22	0.00	No
Furmecyclox	2,786	0	4	0.00	No
Genite	1,691	0	1	0.00	No
Gibberellic acid	2,013	59	1	2.93	No
Glufosinate (RD)	3,546	1	6	0.03	Yes
Glyphosate	4,721	200	21	4.24	Yes
Griseofulvin	10	0	1	0.00	No
Halfenprox	3,807	0	4	0.00	No
Halofenozide	11,566	0	5	0.00	No
Halosulfuron	1,116	0	1	0.00	No
Halosulfuron-methyl	3,289	0	3	0.00	No
Haloxyfop-R (RD)	18,669	15	21	0.08	Yes
Heptachlor (RD)	39,455	19	25	0.05	Yes
Heptenophos	40,569	0	25	0.00	No
Hexachlorobenzene	53,868	430	28	0.80	Yes
Hexachlorobutadiene	273	0	2	0.00	No
Hexachlorocyclohexane (alpha)	26,492	60	25	0.23	Yes
Hexachlorocyclohexane (beta)	26,218	116	25	0.44	Yes
Hexachlorocyclohexane (RD)	39,272	1	25	0.00	No
Hexaconazole	63,573	98	29	0.15	Yes
Hexaflumuron	35,687	7	20	0.02	No
Hexazinone	16,440	1	12	0.01	No
Hexythiazox	58,643	328	30	0.56	Yes
Hydrogen phosphide	136	18	2	13.24	No
Hymexazol	5,440	1	3	0.02	No
Imazalil	63,144	4,621	30	7.32	Yes
Imazamethabenz	5,737	0	7	0.00	No
Imazamox	10,501	0	9	0.00	No
Imazapic	4,761	0	1	0.00	No
Imazapyr	15,279	2	10	0.01	No
Imazaquin	14,938	0	7	0.00	No
Imazethapyr	10,980	1	6	0.01	No
Imazosulfuron	8,058	0	6	0.00	No
Imibenconazole	10,000	0	5	0.00	No
Imidacloprid	61,067	2,587	30	4.24	Yes
Inabenfide	4,331	0	2	0.00	No
Indoxacarb	63,779	785	29	1.23	Yes
Iodfenphos	13,370	0	8	0.00	No
Iodosulfuron-methyl	11,215	0	9	0.00	No
Ioxynil (RD)	13,255	0	16	0.00	Yes

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Ipconazole	8,522	0	8	0.00	No
Iprobenfos	10,539	2	8	0.02	No
Iprodione (RD)	63,510	2,312	30	3.64	Yes
Iprovalicarb	61,970	176	30	0.28	Yes
Isazofos	11,021	0	9	0.00	No
Isobenzan	4,720	0	3	0.00	No
Isocarbamid	2,219	0	3	0.00	No
Isocarbophos	42,863	5	25	0.01	Yes
Isodrin	9,876	0	9	0.00	No
Isofenphos	35,404	0	20	0.00	No
Isofenphos-methyl	55,391	3	29	0.01	Yes
Isomethiozin	40,46	0	3	0.00	No
Isonoruron	2,753	0	4	0.00	No
Isoprocarb	40,335	2	26	0.00	Yes
Isopropalin	6,589	0	5	0.00	No
Isoprothiolane	39,665	92	25	0.23	No
Isoproturon	42,808	0	25	0.00	No
Isopyrazam	647	0	2	0.00	No
Isoxaben	19,454	2	11	0.01	No
Isoxaflutole (RD)	10,378	0	10	0.00	No
Isoxathion	9,314	0	6	0.00	No
Ivermectin	165	0	1	0.00	No
Karbutilate	1,168	0	1	0.00	No
Kasugamycin	33	0	1	0.00	No
Kresoxim-methyl (RD)	63,995	326	30	0.51	Yes
Lactofen	4,129	0	3	0.00	No
Lambda-cyhalothrin	47,904	1,291	28	2.69	Yes
Lenacil	29,573	16	15	0.05	No
Leptophos	7,948	0	7	0.00	No
Lindane	61,941	89	30	0.14	Yes
Linuron	59,477	454	30	0.76	Yes
Lufenuron	52,984	61	28	0.12	Yes
Malathion (RD)	65,348	117	29	0.18	Yes
Maleic hydrazide (RD)	3,178	92	9	2.89	Yes
Mandipropamid	46,323	339	28	0.73	Yes
MCPA (RD)	24,924	19	15	0.08	No
Mecarbam	49,834	2	26	0.00	No
Mecoprop	17,731	1	17	0.01	No
Mefenacet	6,886	1	4	0.01	No
Mefluidide	4,231	2	1	0.05	No
Mepanipyrim (RD)	62,714	181	29	0.29	Yes
Mephosfolan	10,253	0	7	0.00	No
Mepiquat	7,572	152	23	2.01	Yes
Mepronil	35,182	1	20	0.00	No
Meptyldinocap (RD)	4,862	2	10	0.04	Yes
Mercury	1,661	235	1	14.15	No
Merphos	184	0	1	0.00	No
Mesosulfuron	7,649	0	5	0.00	No
Mesotrione (RD)	8,463	0	6	0.00	No
Metaflumizone	34,093	11	24	0.03	Yes
Metalaxyl	57,133	1,374	26	2.40	Yes
Metaldehyde	6,445	9	2	0.14	No
Metamitron	39,633	20	20	0.05	No
Metazachlor	42,889	2	24	0.00	Yes
Metconazole	50,456	2	29	0.00	Yes
Methabenzthiazuron	25,029	6	14	0.02	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Methacrifos (RD)	40,668	0	27	0.00	No
Methamidophos	62,194	42	30	0.07	Yes
Methfuroxam	1,272	0	1	0.00	No
Methidathion	67,193	40	30	0.06	Yes
Methiocarb (RD)	60,023	82	28	0.14	Yes
Methomyl (RD)	60,351	100	28	0.17	Yes
Methoprene	2,904	1	6	0.03	No
Methoprotryne	8,768	0	7	0.00	No
Methothrin	15	0	1	0.00	No
Methoxychlor	53,769	8	29	0.01	Yes
Methoxyfenozide	57,061	684	30	1.20	Yes
Metobromuron	43,477	13	27	0.03	Yes
Metolachlor	11,979	0	12	0.00	No
Metolcarb	11,606	1	8	0.01	No
Metominostrobin	3,849	0	2	0.00	No
Metosulam	13,764	0	11	0.00	No
Metoxuron	21,437	0	16	0.00	No
Metrafenone	44,288	295	23	0.67	No
Metribuzin	55,668	20	27	0.04	No
Metsulfuron-methyl	15,795	0	13	0.00	No
Mevinphos	53,827	1	27	0.00	No
Milbemectin (RD)	5,413	1	3	0.02	No
Mirex	12,044	0	11	0.00	No
Molinate	14,570	2	13	0.01	No
Monalide	6,982	0	3	0.00	No
Monocrotophos	61,181	14	29	0.02	Yes
Monolinuron	24,407	0	16	0.00	No
Monuron	16,363	0	12	0.00	No
Myclobutanil (RD)	63,829	1,380	30	2.16	Yes
Naled	8,492	0	8	0.00	No
Naphthoxyacetic acid, 2-	4,479	0	4	0.00	No
Napropamide	33,561	2	18	0.01	No
Naptalam	4,921	0	3	0.00	No
Neburon	6,167	0	8	0.00	No
Nicosulfuron	11,282	0	12	0.00	No
Nicotine	1,165	31	5	2.66	No
Nitenpyram	46,754	0	28	0.00	Yes
Nitralin	5,021	0	7	0.00	No
Nitrapyrin	7,292	0	2	0.00	No
Nitrofen	36,425	0	24	0.00	No
Nitrothal-Isopropyl	14,650	0	10	0.00	No
Norflurazon	4,764	0	7	0.00	No
Novaluron	25,229	27	16	0.11	No
Noviflumuron	2,105	0	2	0.00	No
Nuarimol	36,544	3	20	0.01	No
Octhilinone	182	0	1	0.00	No
Ofurace	22,062	0	10	0.00	No
Orbencarb	3,758	0	5	0.00	No
Orthosulfamuron	400	0	1	0.00	No
Oryzalin	4,384	0	3	0.00	No
Oxadiargyl	6,707	0	8	0.00	No
Oxadiazon	27,130	3	14	0.01	No
Oxadixyl	61,828	16	30	0.03	Yes
Oxamyl	62,239	15	29	0.02	Yes
Oxasulfuron	3,261	0	3	0.00	No
Oxycarboxin	12,658	0	9	0.00	No
Oxydemeton-methyl	50,986	3	26	0.01	Yes

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
(RD)					
Oxyfluorfen	25,951	55	17	0.21	No
Paclobutrazol	54,232	34	29	0.06	Yes
Paraquat	624	0	4	0.00	No
Parathion	66,324	0	29	0.00	Yes
Parathion-methyl (RD)	55,508	4	28	0.01	Yes
Pebulate	4,919	0	7	0.00	No
Penconazole	65,751	683	29	1.04	Yes
Pencycuron	58,369	85	30	0.15	Yes
Pendimethalin	64,363	314	30	0.49	Yes
Penfluron	4,330	0	2	0.00	No
Penoxsulam	9,421	0	5	0.00	No
Pentachlorophenol	5,383	1	6	0.02	No
Pentanochlor	5,422	0	5	0.00	No
Penthiopyrad	1,285	1	1	0.08	No
Permethrin	66,032	106	28	0.16	Yes
Pethoxamid	15,827	0	13	0.00	No
Phenkapton	2,682	0	3	0.00	No
Phenmedipham (RD)	37,739	35	20	0.09	No
Phenothrin	9,165	3	10	0.03	No
Phenthoate	58,105	9	29	0.02	Yes
Phorate (RD)	40,941	11	24	0.03	No
Phosalone	66,790	6	30	0.01	Yes
Phosfolan	2,430	0	4	0.00	No
Phosmet (RD)	53,832	182	27	0.34	Yes
Phosphamidon	45,824	0	25	0.00	No
Phosphines and phosphides (RD)	30	3	2	10.00	No
Phoxim	46,009	7	29	0.02	Yes
Picloram	4,805	0	6	0.00	No
Picolinafen	23,210	0	14	0.00	No
Picoxystrobin	47,241	2	21	0.00	No
Pinoxaden	7,134	0	8	0.00	No
Piperalin	437	0	1	0.00	No
Piperophos	335	0	2	0.00	No
Pirimicarb (RD)	60,008	732	28	1.22	Yes
Pirimiphos-ethyl	38,402	0	24	0.00	No
Pirimiphos-methyl	69,830	784	30	1.12	Yes
Prallethrin	483	0	2	0.00	No
Pretilachlor	3,412	0	6	0.00	No
Primisulfuron	478	0	1	0.00	No
Primisulfuron-Methyl	3,570	0	3	0.00	No
Probenazole	2,868	1	2	0.03	No
Prochloraz (RD)	42,001	501	24	1.19	Yes
Procymidone (RD)	66,503	43	30	0.06	Yes
Profenofos	67,530	90	29	0.13	Yes
Profluralin	14,405	0	8	0.00	No
Profoxydim	6,229	0	5	0.00	No
Prohexadione	2,066	3	2	0.15	No
Promecarb	32,443	1	15	0.00	No
Prometon	6,379	0	7	0.00	No
Prometryn	40,948	4	23	0.01	No
Propachlor (RD)	10,214	0	11	0.00	No
Propamocarb	48,666	1,624	24	3.34	Yes
Propanil	21,485	5	13	0.02	No
Propaphos	2,543	0	3	0.00	No
Propaquizafop	22,564	0	15	0.00	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Propargite	61,036	251	30	0.41	Yes
Propazine	20,515	1	15	0.00	No
Propetamphos	19,590	0	11	0.00	No
Propham	43,250	1	25	0.00	No
Propiconazole	64,542	470	29	0.73	Yes
Propineb	65	0	1	0.00	No
Propisochlor	1,201	0	1	0.00	No
Propoxur	52,550	19	29	0.04	Yes
Propoxycarbazone (RD)	6,296	0	5	0.00	No
Propyzamide (RD)	62,760	111	28	0.18	Yes
Proquinazid	37,209	79	19	0.21	No
Prosulfocarb	38,597	112	18	0.29	No
Prosulfuron	7,820	0	8	0.00	No
Prothiocarb	2,166	0	1	0.00	No
Prothioconazole (RD)	37,079	42	26	0.11	Yes
Prothiofos	58,484	3	29	0.01	Yes
Prothoate	2,451	0	2	0.00	No
Pymetrozine	49,940	155	29	0.31	Yes
Pyracarbolid	437	0	1	0.00	No
Pyraclofos	3,005	0	6	0.00	No
Pyraclostrobin	59,665	2,816	30	4.72	Yes
Pyraflufen-ethyl	11,277	0	12	0.00	No
Pyrazophos	58,637	1	29	0.00	Yes
Pyrazoxyfen	479	0	1	0.00	No
Pyrethrins	27,579	36	24	0.13	Yes
Pyributicarb	4,238	0	1	0.00	No
Pyridaben	63,190	206	30	0.33	Yes
Pyridalyl	14,133	18	7	0.13	No
Pyridaphenthion	42,945	0	21	0.00	No
Pyridate (RD)	12,663	0	11	0.00	No
Pyrifenox	40,328	1	21	0.00	No
Pyrimethanil	65,159	2,273	30	3.49	Yes
Pyrimidifen	7,324	0	4	0.00	No
Pyriproxyfen	60,810	759	30	1.25	Yes
Pyroquilon	5,431	0	5	0.00	No
Pyroxsulam	3,853	0	3	0.00	No
Quinalphos	55,683	13	26	0.02	No
Quinclorac	11,750	2	13	0.02	No
Quinmerac	11,522	3	8	0.03	No
Quinoclamine	7,664	0	6	0.00	No
Quinoxyfen	63,526	384	29	0.60	Yes
Quintozene (RD)	48,945	12	24	0.02	No
Quizalofop	9,523	6	11	0.06	No
Rabenzazole	4,330	0	2	0.00	No
Resmethrin	17,803	4	25	0.02	Yes
Rimsulfuron	20,979	1	15	0.00	No
Rotenone	40,754	2	26	0.00	Yes
Schradan	2,105	0	2	0.00	No
Sebuthylazine	5,128	0	4	0.00	No
Secbumeton	1,301	0	6	0.00	No
Siduron	5,074	0	5	0.00	No
Silafluofen	7,307	0	6	0.00	No
Silthiofam	13,421	0	7	0.00	No
Simazine	41,168	0	24	0.00	No
Simeconazole	438	0	1	0.00	No
Simetryn	3,039	0	4	0.00	No
Spinetoram	14,371	40	6	0.28	No

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Spinosad	53,593	1,022	29	1.91	Yes
Spirodiclofen	51,387	174	28	0.34	Yes
Spiromesifen	45,064	250	25	0.55	Yes
Spirotetramat (RD)	24,186	206	12	0.85	No
Spiroxamine (RD)	59,160	226	30	0.38	Yes
Streptomycin	216	0	1	0.00	No
Sulcotrione	11,001	0	8	0.00	No
Sulfallate	182	0	1	0.00	No
Sulfentrazone	5,289	0	6	0.00	No
Sulfometuron-Methyl	78	0	1	0.00	No
Sulfosulfuron	4,130	0	5	0.00	No
Sulfotep	38,879	1	20	0.00	No
Sulphur	2,246	27	3	1.20	No
Sulprofos	8,399	0	10	0.00	No
tau-Fluvalinate	58,000	43	28	0.07	Yes
TCMTB	3,076	0	5	0.00	No
Tebuconazole (RD)	64,606	2,283	30	3.53	Yes
Tebufenozide	57,512	88	29	0.15	Yes
Tebufenpyrad	62,660	183	30	0.29	Yes
Tebupirimphos	1,236	0	4	0.00	No
Tebutam	1,812	0	3	0.00	No
Tebuthiuron	2,127	0	2	0.00	No
Tecloftalam	4,231	0	1	0.00	No
Tecnazene	49,444	0	27	0.00	No
Teflubenzuron	53,863	22	28	0.04	Yes
Tefluthrin	55,002	18	28	0.03	Yes
Tembotrione (RD)	12,980	0	5	0.00	No
Temephos	1,476	0	6	0.00	No
TEPP	4,866	0	5	0.00	No
Tepraloxydim (RD)	20,880	5	11	0.02	No
Terbacil	11,948	3	11	0.03	No
Terbucarb	1,913	0	4	0.00	No
Terbufos	33,636	1	21	0.00	No
Terbumeton	9,742	0	9	0.00	No
Terbuthylazine	55,426	37	28	0.07	Yes
Terbutryn	38,396	4	21	0.01	No
Tetrachlorvinphos	28,272	0	19	0.00	No
Tetraconazole	64,113	301	29	0.47	Yes
Tetradifon	65,531	9	30	0.01	Yes
Tetramethrin	43,118	17	27	0.04	Yes
Tetrasul	11,466	0	8	0.00	No
Thenylchlor	2,105	0	2	0.00	No
Thiabendazole (RD)	60,846	2,783	29	4.57	Yes
Thiacloprid	61,066	1,625	30	2.66	Yes
Thiametoxam (RD)	59,343	727	28	1.23	Yes
Thiazopyr	2,105	0	2	0.00	No
Thidiazuron	2,676	0	3	0.00	No
Thiencarbazone	1,689	0	1	0.00	No
Thifensulfuron	143	0	1	0.00	No
Thifensulfuron-methyl	14,910	0	10	0.00	No
Thiobencarb	13,987	0	11	0.00	No
Thiocyclam	4,476	0	4	0.00	No
Thiofanox	6,347	0	5	0.00	No
Thiometon	25,492	0	15	0.00	No
Thionazin	7,265	0	6	0.00	No
Thiophanate-ethyl	2,682	0	4	0.00	No
Thiophanate-methyl	59,016	371	29	0.63	Yes

Pesticide	No of determinations	No of detections (results >LOQ)	No of countries analysing	Detection rate (in %)	Pesticide covered by 2014 EUCP
Thiosultap sodium	4	0	1	0.00	No
Thiram	78	0	3	0.00	No
Tiocarbazil	3,783	0	5	0.00	No
Tolclofos-methyl	65,236	76	30	0.12	Yes
Tolfenpyrad	7,334	10	8	0.14	No
Tolylfluanid (RD)	50,887	2	27	0.00	Yes
Topramezone	5,917	0	6	0.00	Yes
Tralkoxydim	12,481	0	10	0.00	No
Tralomethrin	2,409	0	5	0.00	No
Transfluthrin	7,068	0	8	0.00	No
Triadimenol (RD)	62,660	665	28	1.06	Yes
Tri-allate	27,465	1	17	0.00	No
Triamiphos	3,169	0	4	0.00	No
Triapenthenol	2,665	0	2	0.00	No
Triasulfuron	8,841	0	13	0.00	No
Triazamate	11,720	0	7	0.00	No
Triazophos	68,509	56	29	0.08	Yes
Triazoxide	4,775	0	2	0.00	No
Tribenuron-methyl	5,777	0	9	0.00	No
Tribufos	2,475	0	2	0.00	No
Trichlamide	2,013	1	1	0.05	No
Trichlorfon	51,674	6	28	0.01	Yes
Trichloronat	16,487	0	11	0.00	No
Triclopyr (RD)	22,267	5	12	0.02	No
Tricyclazole	42,007	229	27	0.55	No
Tridemorph	7,679	2	7	0.03	No
Tridiphane	417	0	1	0.00	No
Trietazine	2,356	0	3	0.00	No
Trifenmorph	439	0	2	0.00	No
Trifloxystrobin (RD)	63,004	1,392	29	2.21	Yes
Trifloxysulfuron	4,238	0	1	0.00	No
Triflumizole (RD)	31,687	32	10	0.10	No
Triflumuron	53,724	89	29	0.17	Yes
Trifluralin	61,008	12	29	0.02	Yes
Triflusulfuron	685	0	1	0.00	No
Triflusulfuron-Methyl	8,983	0	7	0.00	No
Triforine	29,891	2	20	0.01	No
Trimethacarb	4,004	0	5	0.00	No
Trimethyl-sulfonium cation	1,724	26	2	1.51	No
Trinexapac	6,087	14	3	0.23	No
Trinexapac-Ethyl	9,074	0	7	0.00	No
Triticonazole	53,194	2	29	0.00	Yes
Tritosulfuron	7,708	0	4	0.00	No
Uniconazole	3,463	2	5	0.06	No
Valifenalate	4,801	0	4	0.00	No
Vamidothion	23,769	0	19	0.00	No
Vernolate	2,464	0	3	0.00	No
Vinclozolin (RD)	28,312	5	23	0.02	Yes
XMC	2,543	0	3	0.00	No
Ziram	2	0	1	0.00	No
Zoxamide	58,746	61	29	0.10	Yes

Table 19: Food to be analysed in 2014 according to Regulation (EC) No 669/2009 on import controls

Country of origin	Food	Food name (code) in food classification under Reg. 396/2005[(a)]	Frequency of checks
Cambodia	Aubergines		50%
	Chinese celery	Celery leaves (0256030)	50%
	Yardlong beans (Vigna unguiculata *spp.sesquipedalis*)	Beans with pods (0260010)	50%
China	Chinese broccoli	Broccoli (0241010)	20%
	Pomelos	Grapefruit (0110010)	20%
	Tea, whether or not flavoured		10%
Dominican Republic	Aubergines		10%
	Bitter melon (Mormodica charantia)	Courgettes (0232030).	10%
	Peppers (*Capsicum spp.)*		20%
	Yardlong beans (Vigna unguiculata *spp.sesquipedalis*)[(b)]	Beans with pods (0260010)	20%
Egypt	Oranges (fresh or dried)		10%
	Peppers (*Capsicum spp.*)		10%
	Strawberries		10%
Kenya	Beans with pods (unshelled)		10%
	Peas with pods (unshelled)		10%
Morocco	Mint	Basil (0256080)	10%
Nigeria	Dried beans		50%
Peru	Table grapes		10%
Thailand	Aubergines		20%
	Basil (holy, sweet)		10%
	Coriander leaves	Celery leaves (0256030)	10%
	Peppers (*Capsicum spp.*)		10%
	Yardlong beans (Vigna unguiculata *spp.sesquipedalis*)	Beans with pods (0260010)	20%
Turkey	Peppers (*Capsicum spp.*)		10%
	Vine leaves		10%
Vietnam	Basil (holy, sweet)		20%
	Coriander leaves	Celery leaves (0256030)	20%
	Dragon fruit		20%
	Mint	Basil (0256080)	20%
	Okra		20%
	Parsley		20%
	Peppers (*Capsicum spp.*)		20%

(a): Corresponding name in the food classification under Regulation (EC) No 396/2005 (only if the food product to be analysed under Regulation 669/2005 is not listed in Annex I, Part A of Regulation 212/2013).

Appendix D – Background information and detailed results for dietary risk assessment

Table 20: ADI/ARfD values for compounds added to the EUCP and changed ADI/ARfD values (compared with toxicological reference values reported in 2013 EU report on pesticide residues in food (EFSA, 2015c)

Pesticide	ADI (mg/kg bw per d)	Year	Source	ARfD (mg/kg bw)	Year	Source
Dichlorprop (RD)	0.06	2006	COM	0.5	2006	COM
Ethirimol	0.035	2010	EFSA	n.n.	2010	EFSA
Famoxadone	0.006	2014	EFSA	0.1	2014	EFSA
Fenamidone[(a)]	0.03	2003	COM	n.n.	2003	COM
Fenpropidin (RD)	0.02	2012	COM	0.02	2012	COM
Glufosinate (RD)[(b)]	0.019	2013	COM	0.019	2013	COM
Glyphosate[(c)]	0.5	2015	EFSA	0.5	2015	EFSA
Metalaxyl	0.08	2014	EFSA	0.5	2014	EFSA
Metazachlor	0.08	2008	EFSA	0.5	2008	EFSA
Pendimethalin	0.0125	2015	EFSA	0.3	2015	EFSA
Topramezone	0.001	2014	EFSA	0.001	2014	EFSA

(a): Fenamidone: in December 2015 in the framework of the peer review, Member State experts did not set reference values of fenamidone because no conclusion on the genotoxic potential of fenamidone could be drawn (EFSA, 2016b). In absence of more EFSA performed the risk assessment on the basis of the toxicological reference values established in the past.

(b): Glufosinate: the toxicological reference values derived for glufosinate ammonium (ADI: 0.021 mg/kg bw per day, ARfD: 0.021 mg/kg bw) were recalculated to glufosinate to match with the residue definition.

(c): Glyphosate: In November 2015, the EFSA conclusion on the peer review of glyphosate was published (EFSA, 2015f), where new toxicological reference values were proposed. The risk assessment was performed with the new ADI and ARfD (previous ADI: 0.3 mg/kg bw per day, previously no ARfD was considered necessary).

Results of short-term dietary risk assessment for food products in focus of the EUCP, expressed as percentage of the ARfD

In the following Figures the residue concentrations are presented individually expressed as percentage of the ARfD. The blue dots refer to results reported under the EUCP, whereas the orange dots refer to findings in samples that were analysed in the framework of the national control programmes. The figures in brackets next to the name of the pesticides represent the number of samples with residues below the LOQ, number of samples with detectable residues below the MRL, and the number of samples with residues above the MRL.

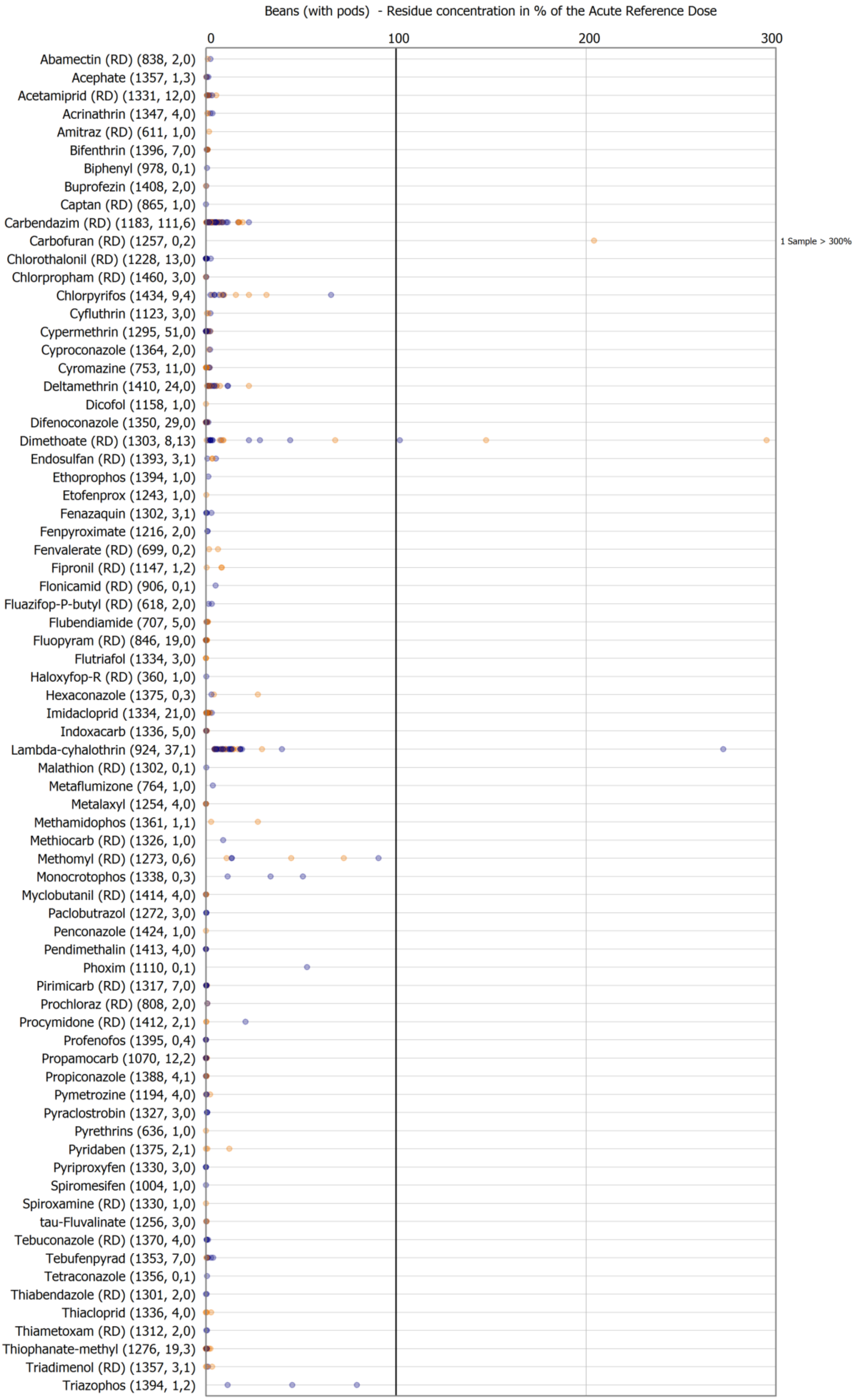

Figure 63: Short-term dietary risk assessment - beans with pods

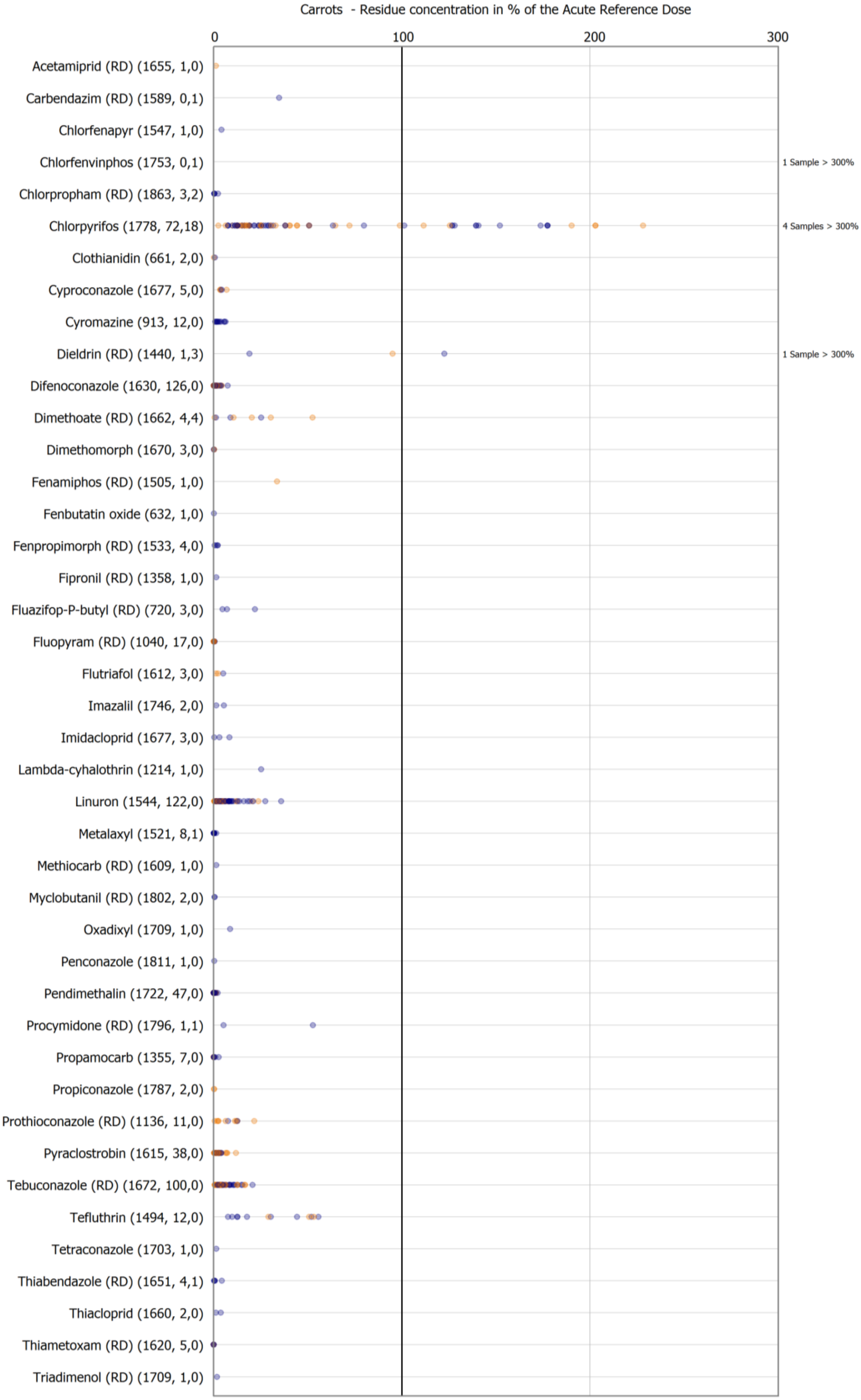

Figure 64: Short-term dietary risk assessment - carrots

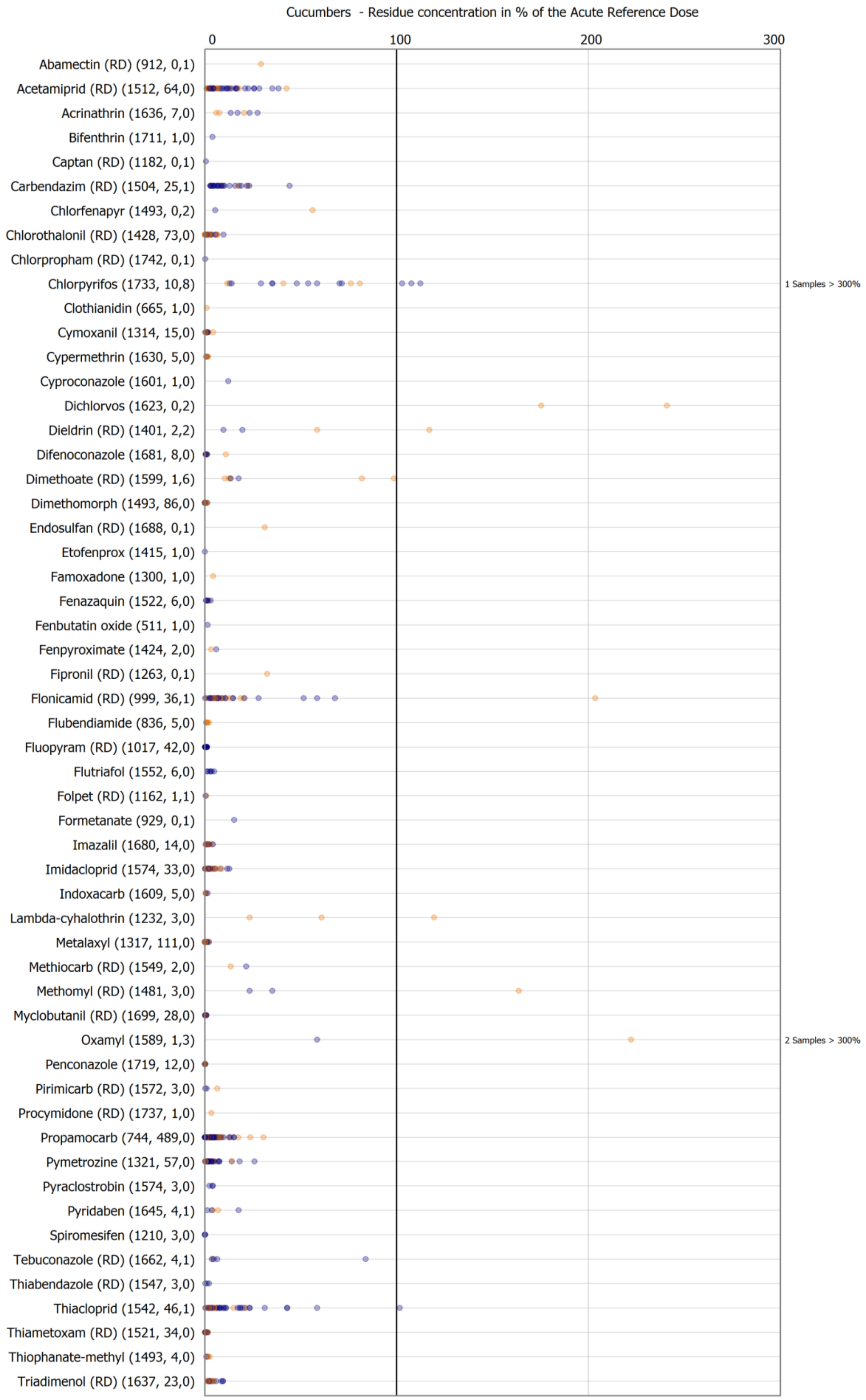

Figure 65: Short-term dietary risk assessment - cucumbers

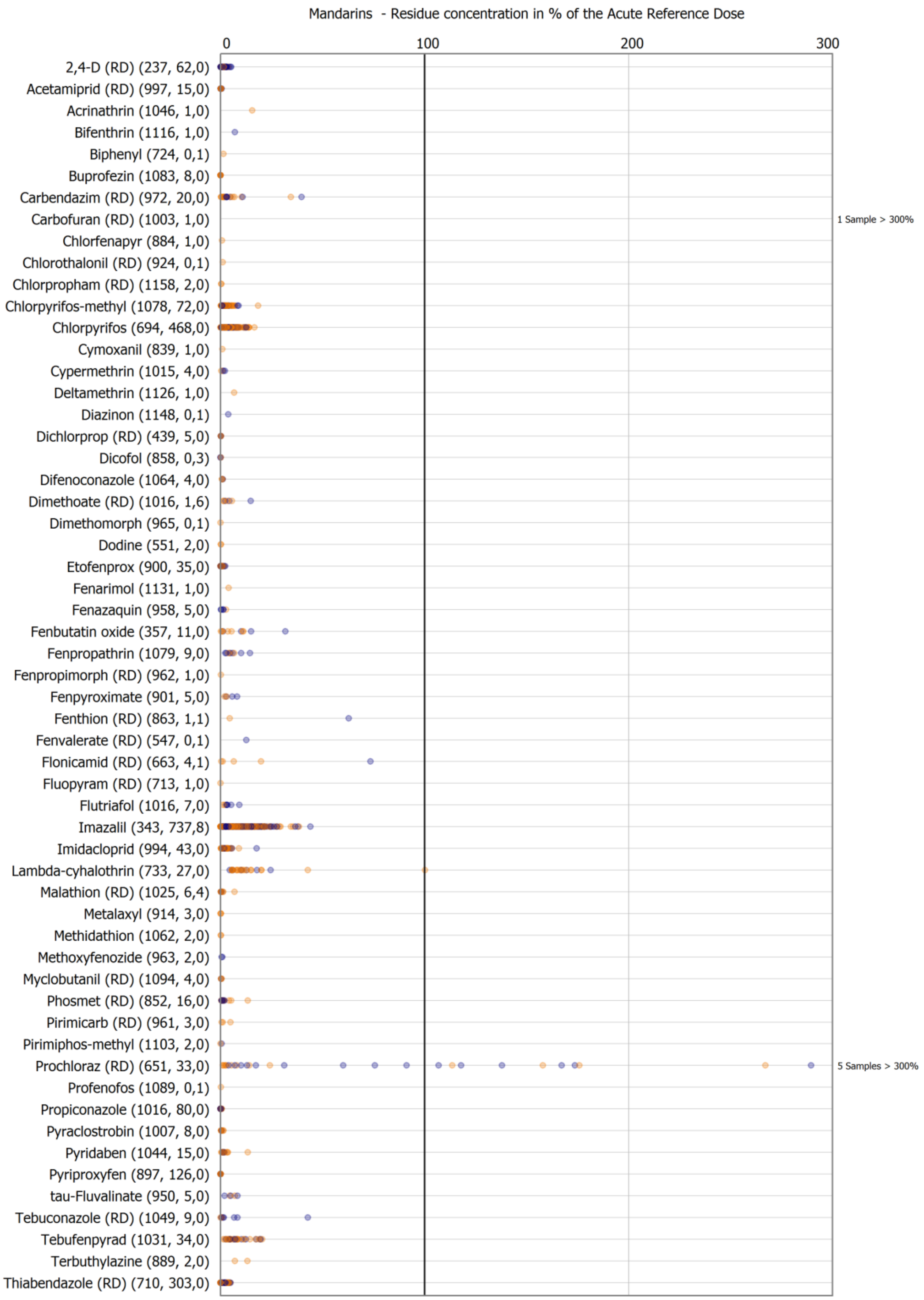

Figure 66: Short-term dietary risk assessment - mandarins

Figure 67: Short-term dietary risk assessment - oranges

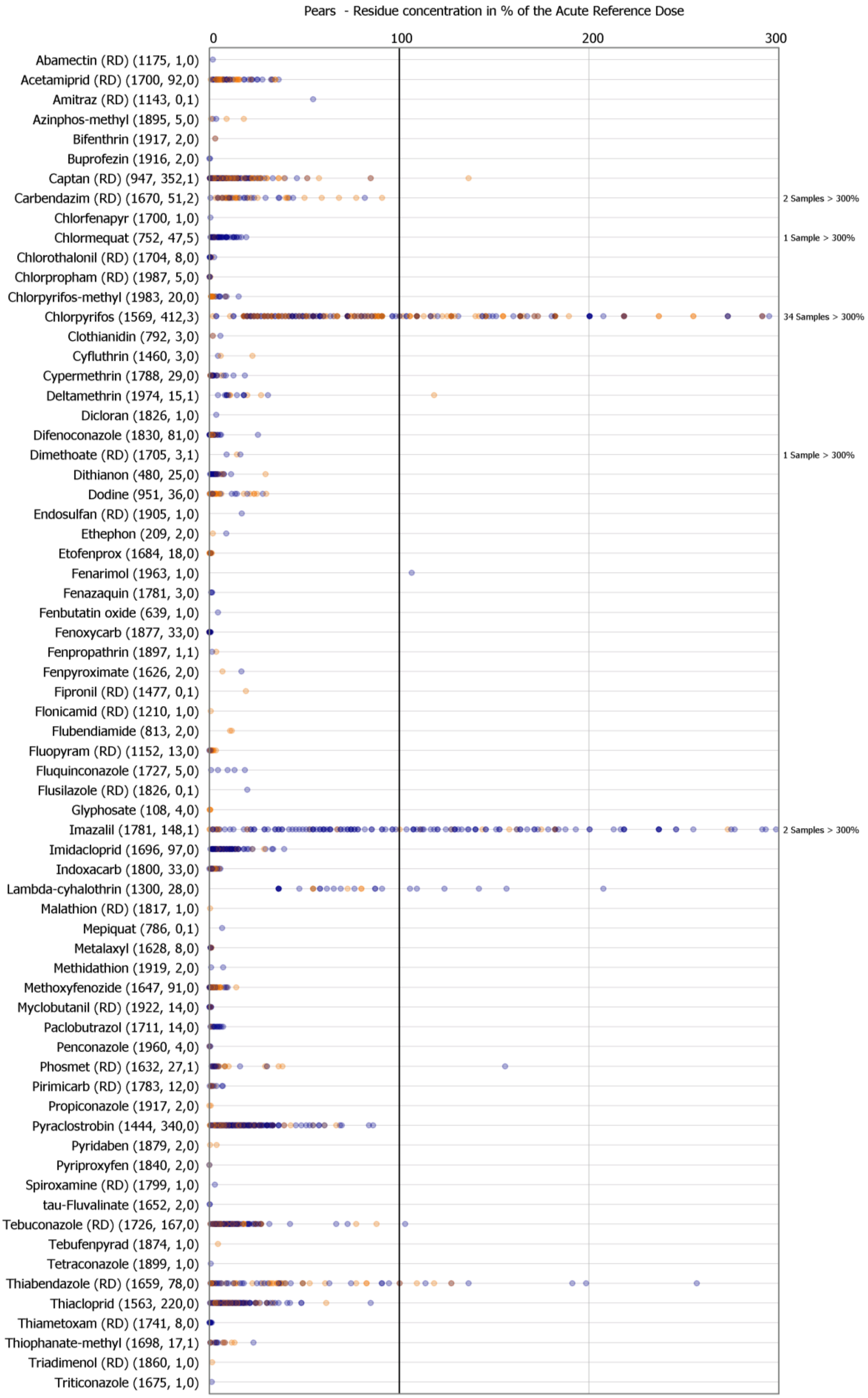

Figure 68: Short-term dietary risk assessment - pears

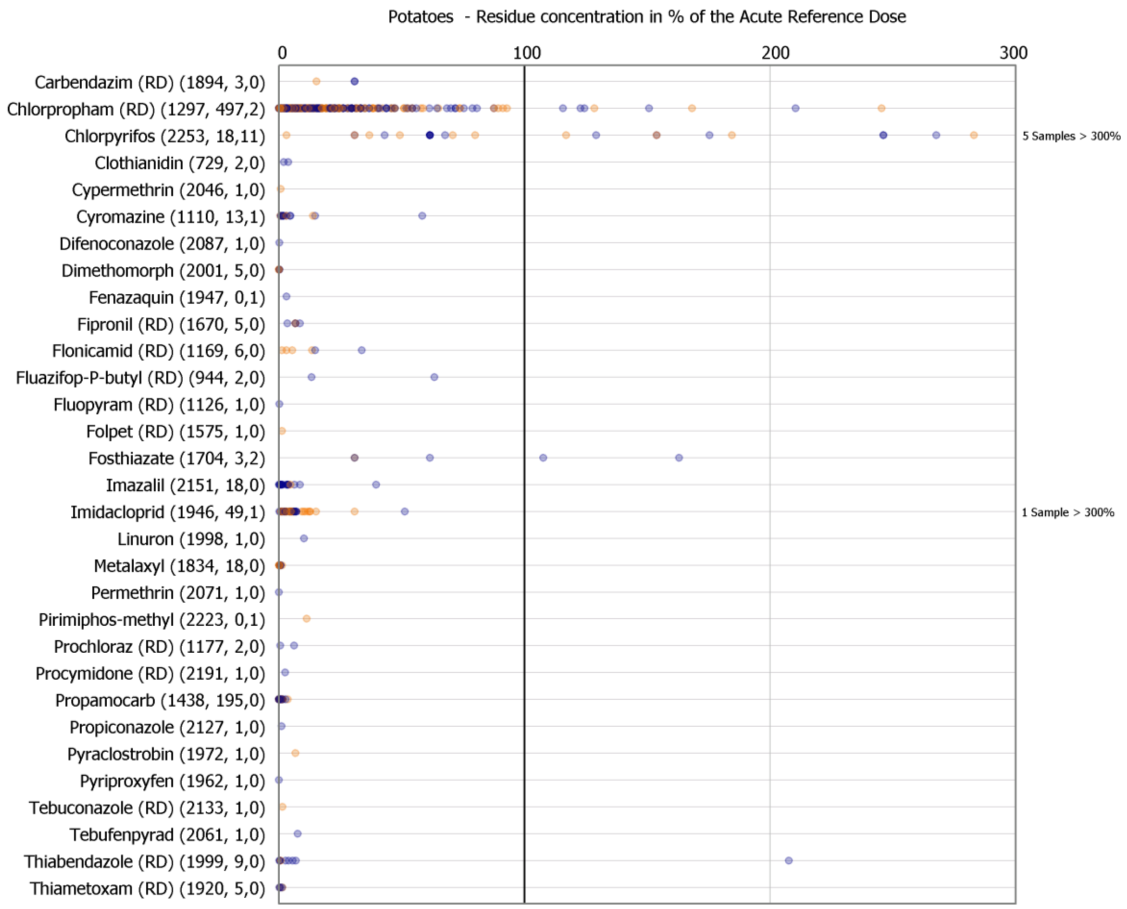

Figure 69: Short-term dietary risk assessment - potatoes

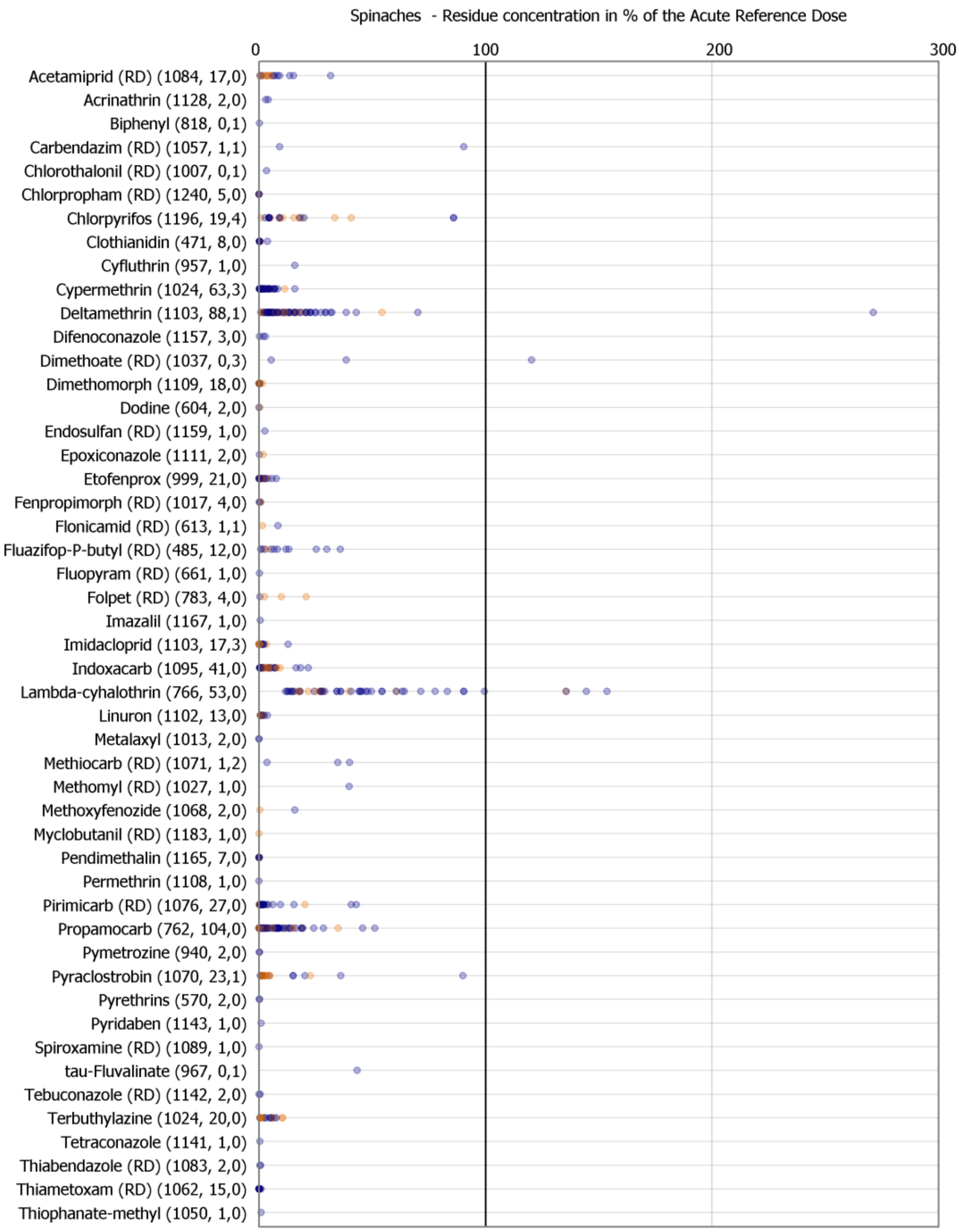

Figure 70: Short-term dietary risk assessment - spinach

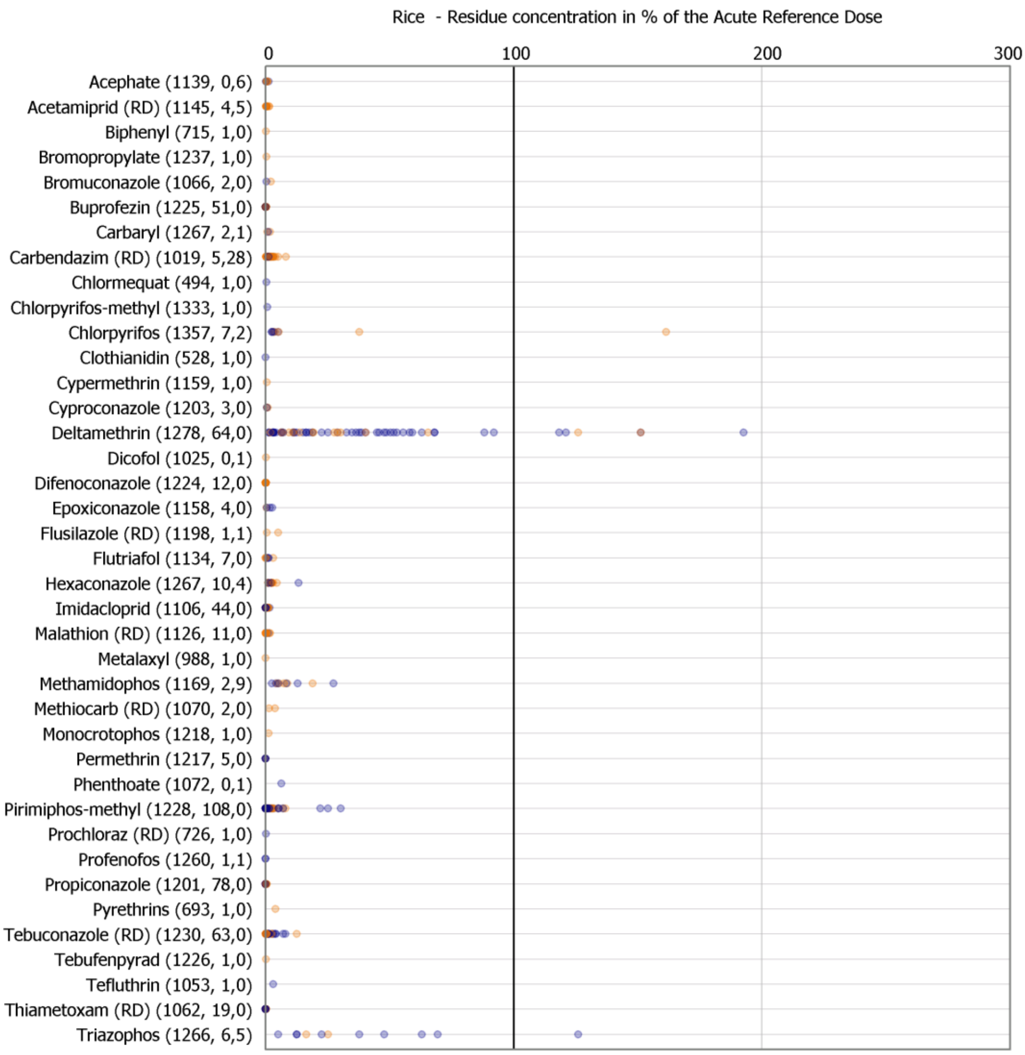

Figure 71: Short-term dietary risk assessment - rice

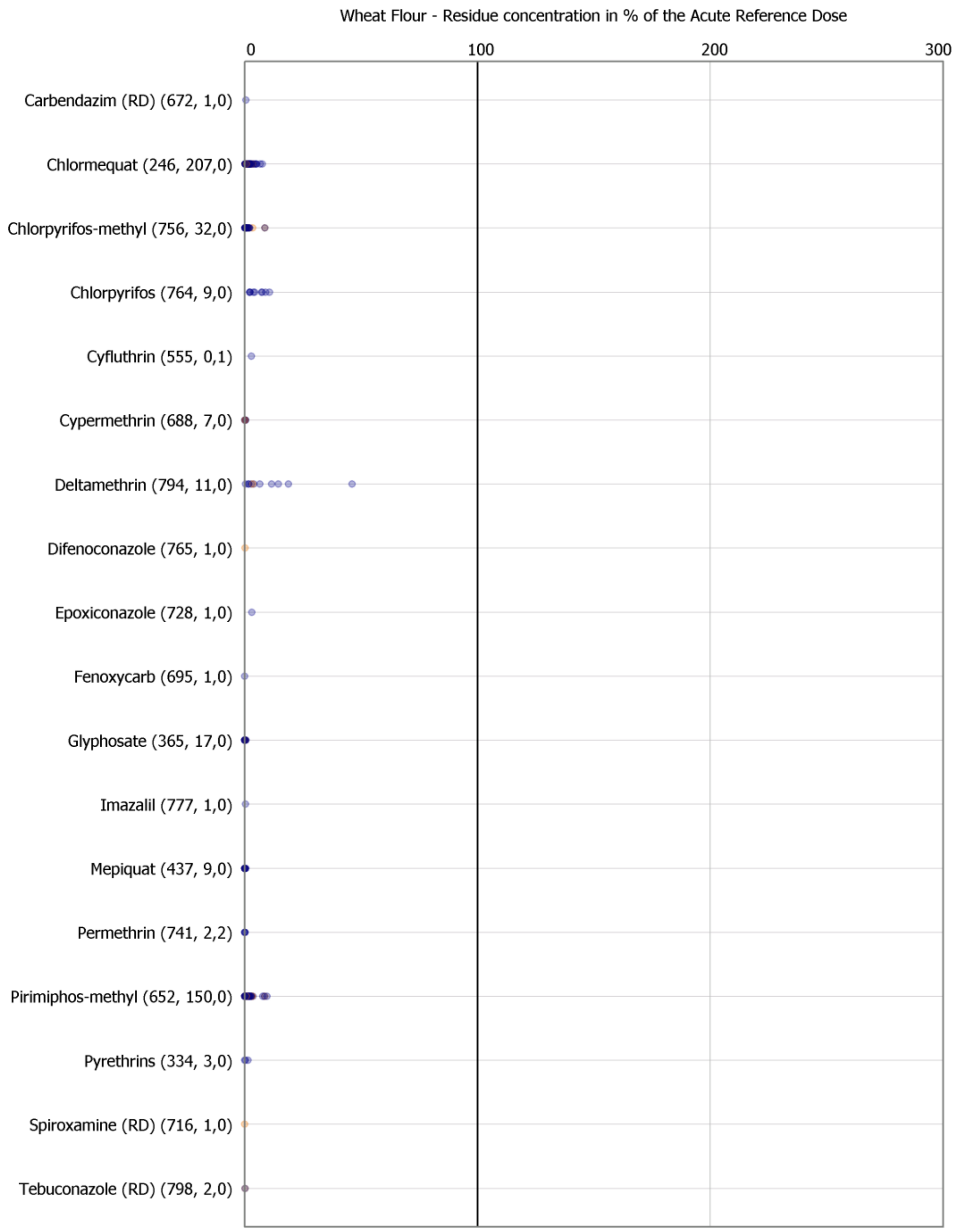

Figure 72: Short-term dietary risk assessment – wheat flour

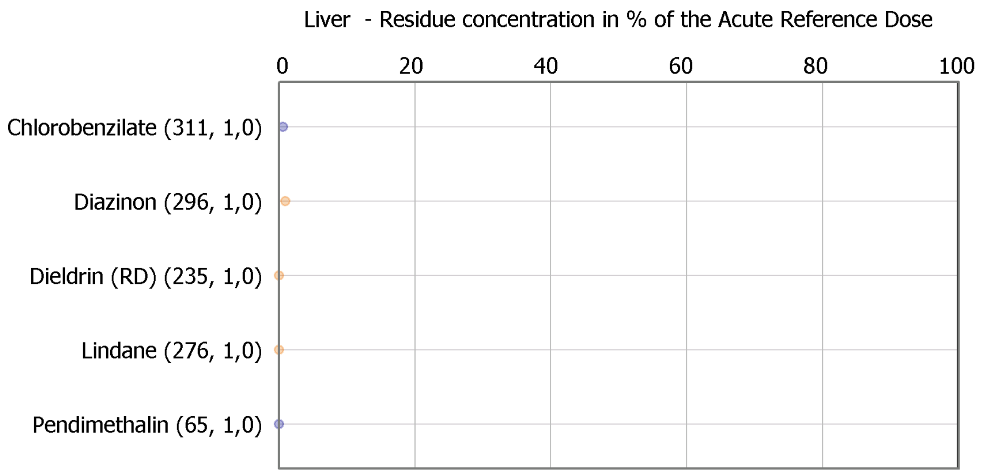

Figure 73: Short-term dietary risk assessment - liver

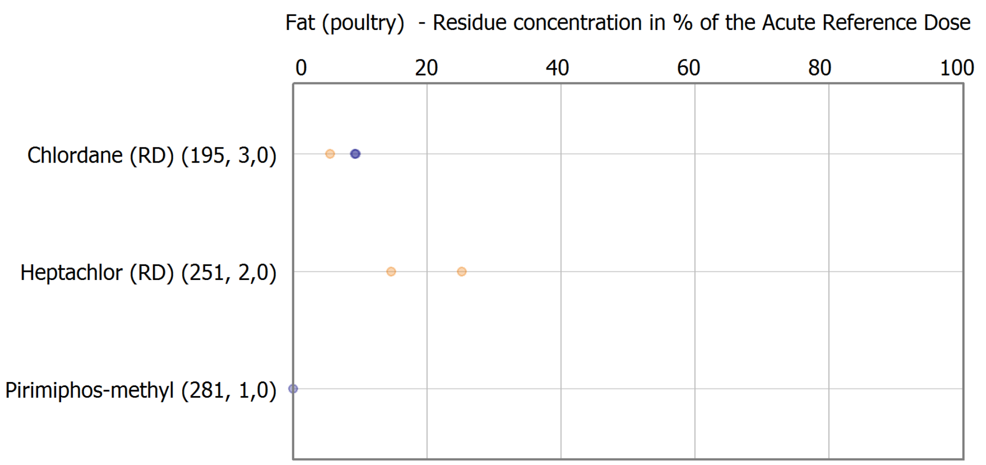

Figure 74: Short-term dietary risk assessment – poultry muscle/fat