Residues of non-EU-approved pesticides in food

By Lars Neumeister, pesticide expert, Germany, July 2025

Executive Summary

Dangerous pesticides that are banned in the EU for good reason continue to be produced by European corporations such as Bayer, BASF, and Biesterfeld and exported to countries in the Global South. There, they are sprayed on herbs, vegetables, fruit, and tea. The substances endanger local users, and the food ends up back in our supermarkets as imported goods, often with residues of precisely those banned substances. Many of these pesticides are carcinogenic, mutagenic, endocrine disruptors, neurotoxic and/or harmful to fertility.

The European Union accounts for about **50 million hectares** of arable cropland in third countries—roughly the size of Spain and equivalent to half of the arable land inside the EU.

This short report evaluates the 2023 residue data provided by EFSA to assess the presence of non-approved pesticides in food intended for human consumption. Overall, 9% of the evaluated samples contained residues of one or more non-EU-approved pesticides at or above the limit of quantification (LOQ). Better testing leads to much higher detection rates.

In total, approximately 580 substances—including pesticide metabolites—were found in food samples. These analytes originate from over 400 different pesticides, more than 200 of which were not permitted for use in the European Union in 2023.[1]. The non EU-approved pesticides most frequently- detected were the insecticides **imidacloprid, thiamethoxam/clothianidin, chlorpyrifos, bifenthrin** and the fungicides **carbendazim/benomyl** and **flutriafol**. Several highly -hazardous pesticides (as defined by FAO[2]) also ranked high.

Bananas and other tropical fruits, tea, rice, okra and spices commonly contain „illegal“ pesticides in around 50% of the samples. Around 50% of the samples from Rwanda, Cambodia, Madagascar, Paraguay and Bangladesh contain of residues from non-EU approved pesticides.

[1] Please be aware the identity of a pesticides causing a residue is not always 100% clear, because there are group definitions and several metabolites may steem from origin from different pesticides.

[2] https://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/hhp/en/

Introduction: Europe's „Imported Land"

According to the European Joint Research Centre (JRC), the European Union uses about **50 million hectares** of arable cropland in third countries—roughly the size of Spain[3] and equivalent to half of the arable land inside the EU. For comparison, this area matches the entire EU cereal (grain) acreage.

Most of this **''imported land''** is used to feed the EU's six billion farm animals, but large areas also produce cotton, rice, tea, cocoa and coffee. Tropical fruits such as banana, pineapple, papaya and mango, as well as spices (e.g. cinnamon, clove, nutmeg, pepper, vanilla), grow almost exclusively abroad. Fresh fruit and vegetables are likewise imported when labour is cheaper or growing seasons do not overlap with European production (e.g. winter strawberries from Morocco or Egypt).

EU Pesticide Regulation and the Double Standard

Thanks to sustained pressure from civil society· groups, the European Commission has banned more than **250 active substances** via Regulation (EU) 649/2012[4]. Many others have never been authorised or expired.

By contrast, pesticide rules in many third countries are less stringent. For example, the EU now allows about **210** synthetic active ingredients, while Brazil permits more than **360**. European agrochemical companies—Bayer CropScience, BASF, Corteva and others—still produce and export many substances that are no longer approved at home. Not only enter contaminated products the European market, the pesticides also cause damage to local communities and workers. This double standard has been repeatedly highlighted by NGOs such as foodwatch.

Materials and Methods

To assess the extent of non·EU·approved pesticide residues in food, EFSA's **2023 monitoring data** were analysed. Raw CSV files were downloaded from *Zenodo* and imported into a relational database linking all relevant metadata.

The cleaned dataset contained about **126.700 conventional food samples**. Most were classified as unprocessed *Plant Commodities*. Figure 1 shows the distribution of samples across commodity groups.

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[3] https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/eu-land-use-footprint-modelling-land-needed-eu-consumption-2024-08-23_en

4 Regulation (EU) 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals

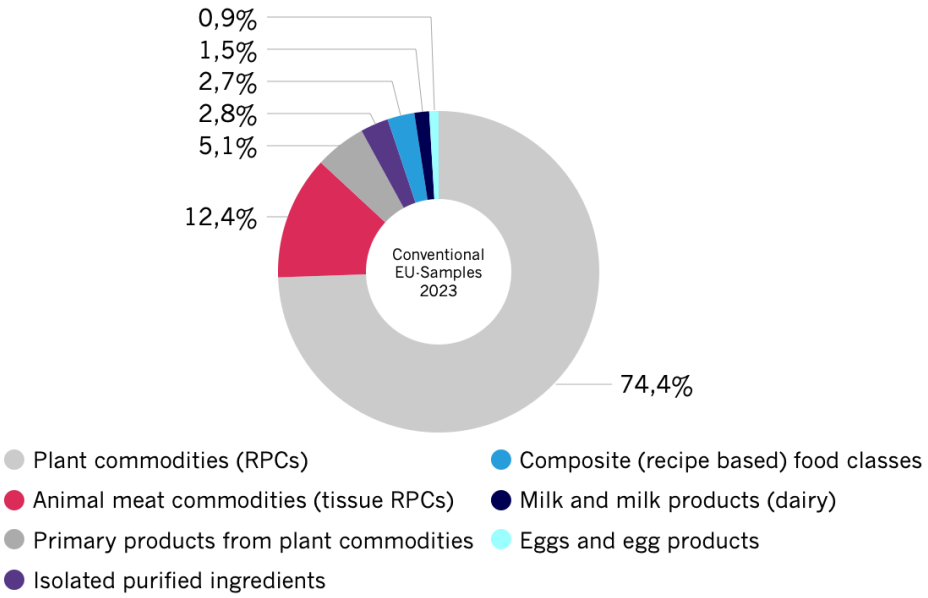


Figure 1 Distribution of evaluated samples by matrix hierarchy (conventional, samples taken by EU-MS, 2023)

Overview of 2023 Residue Findings

Overall, 8,5% of the evaluated samples contained residues of one or more non-EU-approved pesticides above the limit of quantification (LOQ).

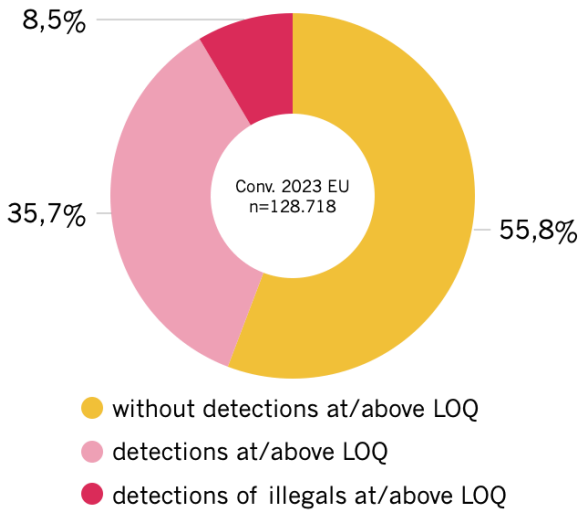


Figure 1 Overall results

Governmental laboratories across Europe tested for nearly 1.400 different pesticide-related substances. Of these, approximately 580 substances incl. metabolites were detected in food samples. These 580 analytes originate from >400 different pesticides, of which >200 were not permitted to be used in 2023 in the European Union[5].

The non-EU-approved pesticides most frequently detected were the insecticides **imidacloprid, thiamethoxam/clothianidin, chlorpyrifos, bifenthrin** and the fungicides **carbendazim/benomyl** and **flutriafol**.

Several highly-hazardous pesticides (as defined by FAO[6]) also ranked high:

- **Carbendazim/Benomyl** – Mutagen 1B, Repr 1B[7]
- **Chlorpyrifos** – Repr 1B
- **Ethylene oxide** – Carc 1B, Muta 1B, Repr 1B
- **Spirodiclofen** – Carc 1B
- **Thiacloprid** – Repr 1B

Except for benomyl, all were still being exported from EU Member States in 2022–2023.

Persistent organic pollutants (POPs) like Chlordecone[8] or DDT are still frequently detected in food altough banned for decades. These two pesticides occur mostly in animal products, because they persist in soil and accumulate in the food chain.

[5] Please be aware the identity of a pesticides causing a residue is not always 100% clear, because there are group definitions and several metabolites may steem from origin from different pesticides.

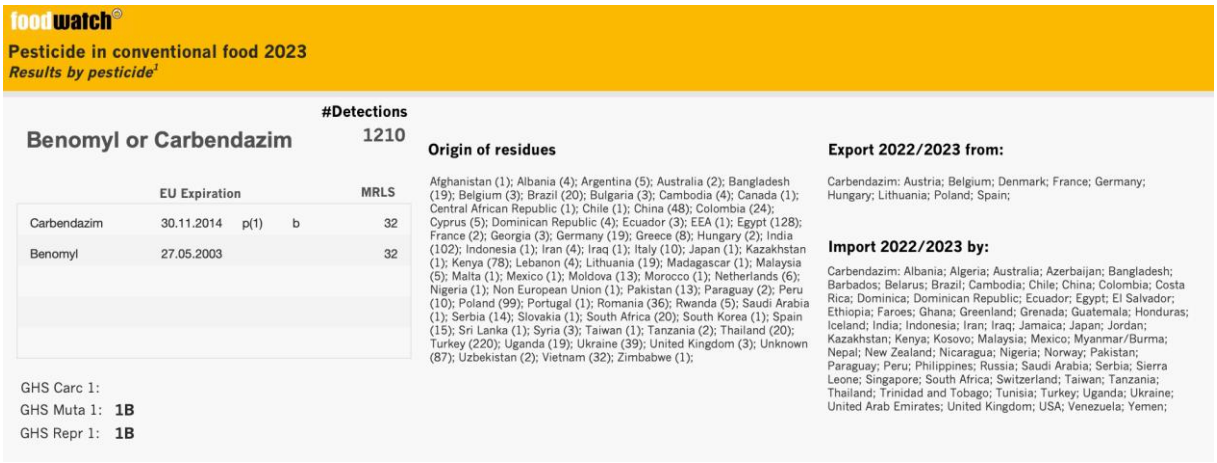
[6] https://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/hhp/en/

[7] Carc 1B = probable carcinogen, Muta 1B = probable mutagen, Repr 1B = probable reproductive toxin

[8] Chlordecone was number one „illegal“ pesticides in France in 2023, because it tested an overproportional number of meat sample for this POP. About 30% of all tests for Chlordecone was conducted in France.

Annex I shows the data for pesticides with more than 100 detections. It shows for each pesticide, when it expired in the EU, the use limitation (b=ban), the number of MRLs, the origin of the residue, the exporting and importing countries 2022/2023.

The following screenshot shows the data for the highly hazardous fungicides Benomyl/ Carbendazim. Both pesticides expired long time ago (2003 and 2014) and usage as agricultural pesticide (p1) is banned (b). There are still 32 EU-MRLs above the limit of detection allowing the exposure of EU-consumers. Benomyl/Benomyl were detected in foods from many countries including those which are targets for EU-Exports (Albania, Australia, Bangladesh, Cambodia, China, Colombia, Dominican Republic and Ecuador...). Benomyl/Carbendazim are both classified as Muta 1B = probable mutagen, Repr 1B = probable reproductive toxin according to the Globally Harmonized System (GHS) as implemented by regulation (EU) 1272/2008. The FAO expressed the need to globally ban these kinds of substances already in 2008, and in the EU pesticides with such a classification cannot be authorized (anymore).



Results by commodity group

The results vary strongly among the food classes: animal derived food is mostly from domestic production and generally rather pesticide “free”[9] except for the POPs pesticides DDT and Chlordecone. Therefore, the percentage of samples containing non-EU-approved pesticides is lower, than for primary products from plant commodities where the share of import samples is much higher (see Figure 2).

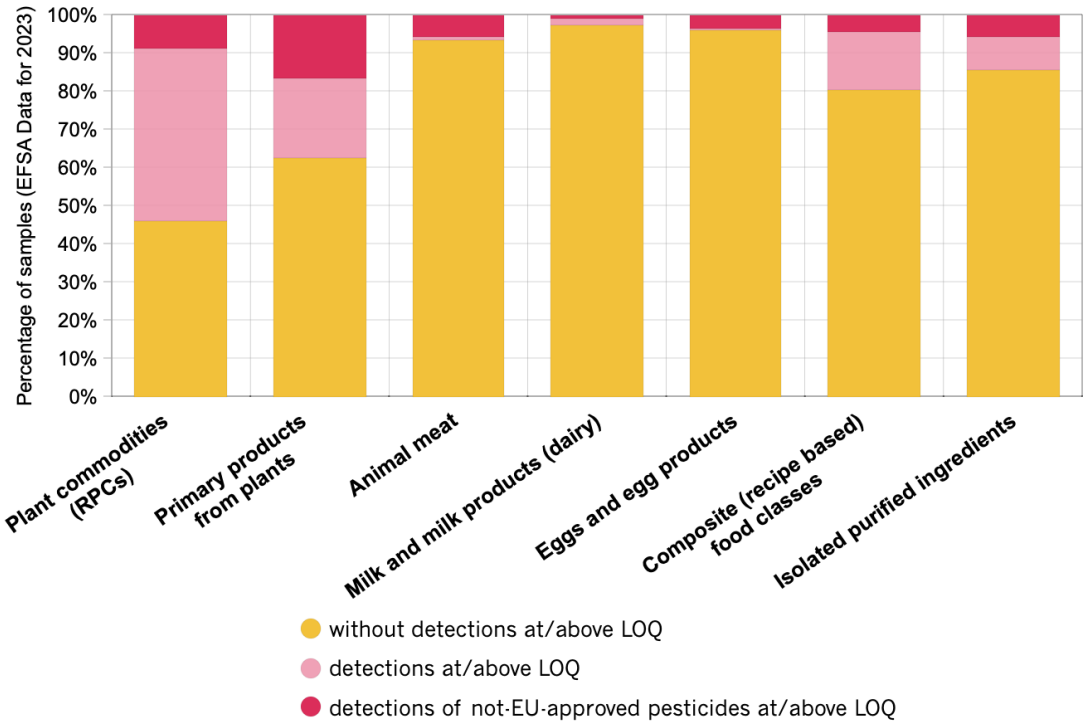


Figure 2 Pesticide residues in food by food class

Impact of Test Intensity on Detection Rates

Testing scope strongly affected results. Samples tested for 300 or more substances contained up to 23% non-EU-approved pesticides depending on the food class.

In general, a higher number of substances tested leads to more residues being found. This trend is clearly visible in the “Plant Commodities (RPC)” group. The percentage of samples with pesticide residues rises steadily from 54% to around 64% when more than 100 substances are tested. Similarly, the detection of substances not approved in the EU rises slightly—from 9% to 11%.

Interestingly, for this commodity group, testing for more than 100 substances does not significantly increase the proportion of positive samples beyond this threshold. **Figure 4** illustrates the results for “Plant Commodities (RPC)” by test intensity.

[9] Most animal derived food is poorly tested. A large number of meat samples is only analysed for one substance (chlordecone).

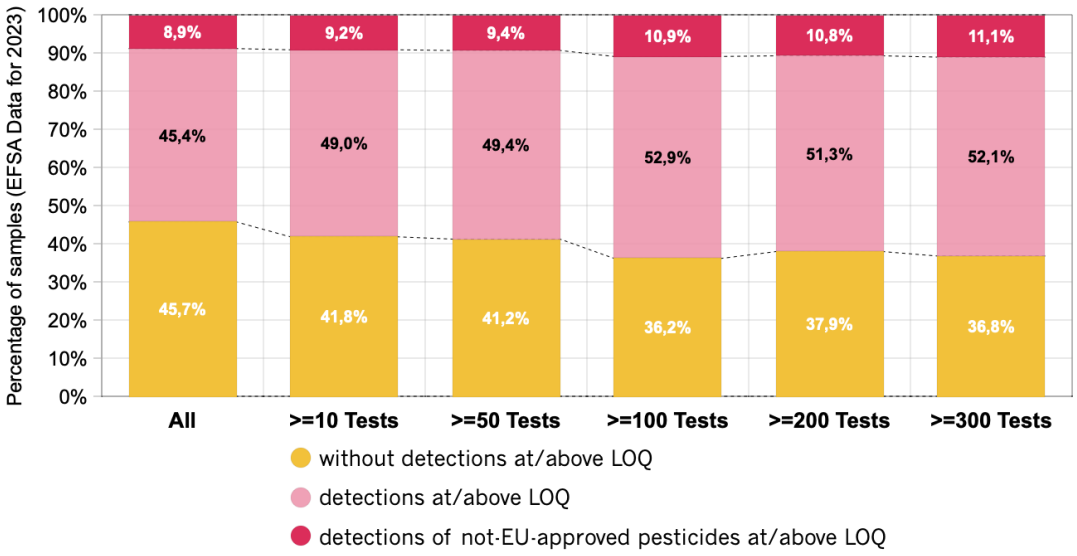


Figure 3 Results for „*Plant Commodity (RPC)*“ by test intensity

For the group “Primary Products Derived from Plant Commodities,” the effect of more extensive testing is even more pronounced. The share of positive samples rises from 37,6% to 48,7% when 300 or more substances are tested—a relative increase of 11 %. The proportion of residues from non-EU-approved substances increases from 16,7% to 23,2% (+6,5%).

This is easy to explain: a larger proportion of these products originates from outside the EU, where a wider range of pesticides is permitted. Consequently, more comprehensive testing leads to higher detection rates. **Figure 5** shows these trends in detail.

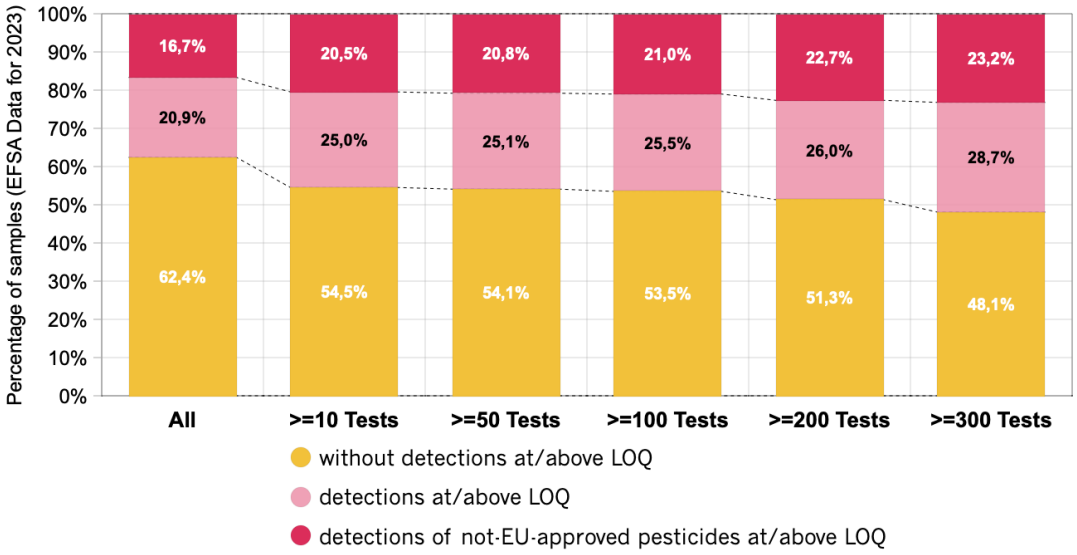


Figure 4 Results for „Primary products derived from plant commodities“ by test intensity

Results by foods and countries of origin

In 25 food items[10] the percentage of residues from non-EU approved pesticides was higher than 30%. Bananas[11] and other tropical fruits, tea, rice, okra and spices commonly contain „illegal“ pesticides (see Table 1). Some samples of tea and some spices contain extremely large number of pesticides: one sample on Indian tea analysed in the Netherlands contained 22 different pesticides of which 18 were not-EU-approved. One sample on Indian cumin seed analysed in France contained 29 different pesticides of which 17 were not-EU-approved.

Table 1 Foods with a percentage of residues from non-EU approved pesticides higher than 30%[12]

[10] Items with a samples size lower 25 sample were excluded.

[11] Please note that the matrix names was taken from the EFSA catalogues were not changed for the purpose of grouping.

[12] The average number of parameters refers to the numberod tested substances per sample.

		#Samples	Avg. #parameter	#Samples positiv	#Samples ("illegal")	% ("illegal")
1	Moringa (with pods)	38	394	27	25	**65,8**
2	Non-fermented tea leaves (green or white	434	372	305	273	**62,9**
3	Bananas and similar-	248	394	230	153	**61,7**
4	Cumin seed	153	232	89	89	**58,2**
5	Papayas	159	453	128	88	**55,3**
6	Yardlong beans (with pods)	66	431	43	33	**50**
7	Tea powder ingredients and extracts	33	441	27	16	**48,5**
8	Common banana	399	447	314	176	**44,1**
9	Granadillas	48	512	43	21	**43,8**
10	Teas leaves, dry and/or fermented, and	208	344	108	89	**42,8**
11	Rice grain, polished	120	359	73	50	**41,7**
12	Tea beverages	34	410	22	14	**41,2**
13	Okra	227	418	126	90	**39,6**
14	Paprika powder	91	164	40	36	**39,6**
15	Dried vine fruits (raisins etc.)	250	430	216	97	**38,8**
16	Quinces	44	323	40	17	**38,6**
17	Common banana - acuminata cultivars	37	139	36	14	**37,8**
18	Indian spice mixes and similar (other	57	45	21	21	**36,8**
19	Coriander leaves	71	424	62	25	**35,2**
20	Tea leaves and stalks, fermented	352	351	187	124	**35,2**
21	Chili peppers	881	404	602	303	**34,4**
22	Soya bean oil, refined	32	491	22	11	**34,4**
23	Rice grain	1.536	344	797	473	**30,8**
24	Basil	175	407	154	53	**30,3**
25	Passionfruits	285	455	235	86	**30,2**

EFSA (2025): Results from the monitoring of pesticide residues in food 2023. CSV Files downloaded from www.zenodo.org. Evaluation by Lars Neumeister. Only residues at/above Limit of Quantification (LOQ). Environmental contaminants from: Brom, Copper, Mercury are excluded from evaluation. Antraquinone, Chlorates, Nikotine, Hydrogen cyanides in linen seed and Amitraz in honey were not counted as "illegal".

In food from 23 countries the percentage of residues from non-EU approved pesticides was higher than 20%. Around 50% of the samples from Rwanda, Cambodia, Madagascar, Paraguay and Bangladesh contain of residues from non-EU approved pesticides (see Table 2).

Table 1 Origin of samples with a percentage of residues from non-EU approved pesticides higher than 20%

			#Samples	Avg. #parameter	#Samples positiv	#Samples ("illegal")	% ("illegal")
1	RW	Rwanda	32	406	24	17	**53,1**
2	KH	Cambodia	119	438	75	61	**51,3**
3	MG	Madagascar	57	365	35	29	**50,9**
4	PY	Paraguay	47	243	26	23	**48,9**
5	BD	Bangladesh	66	274	32	31	**47**
6	GT	Guatemala	49	332	39	21	**42,9**
7	LB	Lebanon	35	338	21	15	**42,9**
8	CN	China	1.269	313	692	507	**40**
9	CO	Colombia	566	436	459	225	**39,8**
10	CR	Costa Rica	352	434	342	136	**38,6**
11	IR	Iran	49	369	23	17	**34,7**
12	CM	Cameroon	33	412	17	10	**30,3**
13	EC	Ecuador	314	335	241	95	**30,3**
14	PK	Pakistan	465	373	275	140	**30,1**
15	DO	Dominican Republic	72	430	39	21	**29,2**
16	TH	Thailand	277	396	143	76	**27,4**
17	IN	India	3.179	191	1.075	847	**26,6**
18	UG	Uganda	286	407	202	71	**24,8**
19	SY	Syria	33	273	12	8	**24,2**
20	LK	Sri Lanka	202	353	106	47	**23,3**
21	RU	Russia	66	364	33	15	**22,7**
22	KE	Kenya	1.551	417	985	349	**22,5**
23	KZ	Kazakhstan	54	319	28	12	**22,2**

EFSA (2025): Results from the monitoring of pesticide residues in food 2023. CSV Files downloaded from www.zenodo.org. Evaluation by Lars Neumeister. Only residues at/above Limit of Quantification (LOQ). Environmental contaminants from: Brom, Copper, Mercury are excluded from evaluation. Antraquinone, Chlorates, Nikotine, Hydrogen cyanides in linen seed and almonds/nuts and Amitraz in honey were not counted as "illegal".

Conclusion

The 2023 EFSA data confirm a persistent double standard: while the EU has banned more than 250 active substances, residues of those same chemicals continue to reach European consumers via imported foods—especially tropical fruits, tea, rice and certain spices. Also, the banned pesticides cause serious harm to local workers and environment. Roughly one in ten conventional food samples and up to one in four intensively tested samples contained at least one nonEUapproved pesticide.

The continued export of highly hazardous pesticides from EU Member States contradicts Europe's stated commitment to Sustainable Development Goals and the Rotterdam Convention's objectives.

Policy recommendations include: (1) lowering EU MRLs for nonapproved substances to the limit of detection, (2) closing the legal loophole that allows EU production and export of banned pesticides, (3) supporting farmers in the Soutern countries to transition toward safer alternatives, (4) supporting governments in third countries to develop legislation to ban pesticides based upon their hazard.

Only by aligning internal standards with external trade practices can the EU credibly protect human health and the environment.