Food Without Pesticides

Shopping Guide for Fruits and Vegetables

New 2012 Evaluation System

GREENPEACE

Contents

Legal Notice

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What this guide provides

Fruits and vegetables are valuable foodstuffs because they contain minerals, vitamins and fibres, which is why we are advised to eat fruits and vegetables. But products from conventional agriculture can contain residues of pesticides and other chemicals. In Germany, about 30,000 tonnes of active pesticide agents are still sprayed on produce every year. **This guide will help you buy fruits and vegetables that have the lowest possible levels of contamination.**

Greenpeace has subjected data taken from Germany's state food inspection authorities and its own testing in 2009/10 to a new evaluation system in 2012. The most important rule of thumb is: **Fruits and vegetables from organic farming can almost always be recommended** – despite occasional media reports of false declarations in the organic farming sector. Seasonal organic food from your own region usually has a good carbon footprint because of shorter transport routes. Several criteria are essential to note regarding produce from conventional farming – which fruit or vegetable is it, what is the country of origin, and what time of year and under what conditions was it cultivated? **The lists on pages 13–18 will help you to make choices.**

For more information and a background paper, please visit:
greenpeace.de/pestizide

Moreover, you can demand to buy uncontaminated food products. Please fill out and sign the action postcard addressed to Minister Ilse Aigner at the German Ministry of Food, Agriculture and Consumer Protection. The time is long overdue for her to take measures to reduce the use of pesticides. **Call on Minister Aigner to make the right decisions on your behalf.**

Enjoy your shopping for food without pesticides!

Manfred Santen
Greenpeace Expert on Chemicals

Overview of test results

Nearly 80 percent of conventionally cultivated fresh fruits and more than 55 percent of vegetables contain pesticides. This was the finding of a Greenpeace survey of more than 22,000 samples tested by Germany's state food inspection authorities in 2009 and 2010. The investigation covered German and imported fruits. A total of 351 active ingredients were found, most often boscalid and cyprodinil, two agents against fungal attack (fungicides).1

Our effort is worth it

Greenpeace's years of consistent work have been successful:

- Many vegetables cultivated conventionally are less contaminated than they were a few years ago. Fruits do not reflect this positive trend to the same degree however.
- For fruits grown in Germany and EU countries, 2 percent of samples exceeded the maximum permissible limits, a better rate than for produce grown outside the European Union.
- Supermarket products contain significantly fewer pesticide residues in comparison to our 2007 test results. Differences between retail chains in levels of contamination have diminished.

This shopping guide deals only with synthetic chemical pesticide residues.

It says nothing about

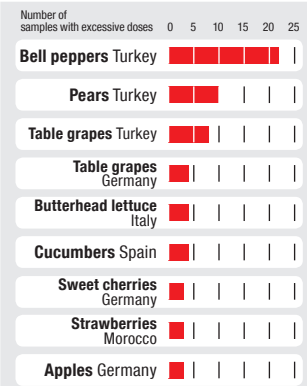
- **microbial contaminants** with consequences for health, such as the EHEC contaminant which caused an epidemic in 2011.
- **Climate issues.** The ecological balance of food also depends on climatic factors. An apple cultivated in winter at the other end of the world and transported a long distance can be more climate-friendly than a domestic Belle de Boskoop apple, which must be kept fresh for several months.

Some fruits and vegetables are very highly contaminated

These success stories should not obscure the fact that there are still problems with produce available in Germany.

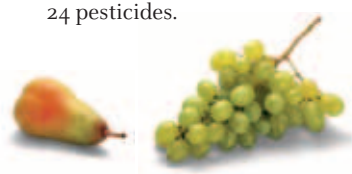
- **Risk products:** Concentrations of pesticides that pose a risk to health were particularly common in bell peppers, pears and table grapes from Turkey, but also in table grapes from Germany and butterhead lettuce from Italy.
- **Excessive pesticide residues** were frequently found in imports from non-European countries. More than 40 percent of the samples from India exceeded maximum permissible limits; this figure was more than 30 percent for Thailand, and between 12 and 21 percent for Egypt, USA, Kenya and the Dominican Republic.

Fruits that often exceeded the acute reference dose*



* Should not be exceeded at one meal to prevent damage to health. Data for 2009/10 from Germany's state food inspection authorities

- **Multiple contamination:** Table grapes from Turkey contained an average of 9 pesticides, strawberries from Belgium 7, butterhead lettuce from Belgium 6. The front-runners were a sample of currants from Germany containing 17 pesticides and a sample of table grapes from Turkey with 24 pesticides.



Pesticides are also sprayed from the air on steep slopes

Pesticides are everywhere

Every day we come into contact with various chemicals, with chemically treated clothing, with everyday objects and toys that contain softening agents, and not least with foods that are contaminated with pesticides and additives.

Pesticides end up in fields, residential areas and home gardens. Insecticides, herbicides and fungicides are supposed to keep unwanted insects, weeds and fungal attacks at bay. But pesticides are also toxic, not only for the organisms being targeted. Some substances damage entire ecosystems. The use of pesticides in the past 50 years has already reduced biodiversity in Europe by half.2 Traces of pesticides can be found everywhere: in soil, water and air, even in the body fat of Arctic polar bears.

Pesticides are used around the

world and can be spread widely due to the global merchandise trade. The toxic fungicide carbendazim was found in 68 food products from 45 countries. The environmentally harmful insecticide chlorpyrifos was found in 64 food products from 45 countries. Some pesticides can cause allergies, others can affect fertility or are mutagenic, and some are carcinogenic. Some pesticides, similar to several plastic softeners, can damage the hormone system.

Hazardous chemical cocktails

All active pesticide agents are individually evaluated in the European Union. To protect people from doses that are too high, there is a legal maximum limit (MRL) set for each substance, as well as an ADI value. Acutely toxic substances

Grapes are often contaminated with several pesticides.

have an additional limit value, the acute reference dose (ARfD). But too little attention has been paid so far to the risk posed by the combination of different chemicals, multiple contamination, and chemical cocktails. Official risk assessment has so far not derived total limits for foods. Studies show however that the mixture of several chemicals together may amplify their effects – even at the low concentrations often found in fruits and vegetables.
The adverse health effects of pesticides can increase in combination with softeners such as those in the packaging for meat and cheese.

Chemical cocktails found on table grapes and other fruits

Vegetables were significantly better off regarding multiple contamination, although one exception was butterhead lettuce. Samples from Belgium contained an average of 6 active agents, and in one sample Greenpeace even found 15. An average of 5 pesticides was found on Italian butterhead lettuce, and an average of 2 on German butterhead lettuce. Strawberries from Belgium contained an average of 7 different active agents, German strawberries had 4. In contrast, strawberries from Egypt and Morocco were less contaminated. An average of 9 active agents was on 62 samples of table grapes from Turkey, and one sample even had 24. Grapes from Germany were hardly better. They contained an average of 5 different pesticides, the same figure for

Limits – abbreviations

- **MRL** (maximum residue limit) = the legally permitted maximum, set by the European Union, of pesticide residue allowed in or on food and feed.
- **ADI** (acceptable daily intake) = the tolerable daily intake of a substance.
- **ARfD** (acute reference dose) = specifies the maximum amount of a substance that can be ingested in one or more meals a day without an identifiable risk to health.

grapes from India. Grapes from Argentina and Egypt were less contaminated.

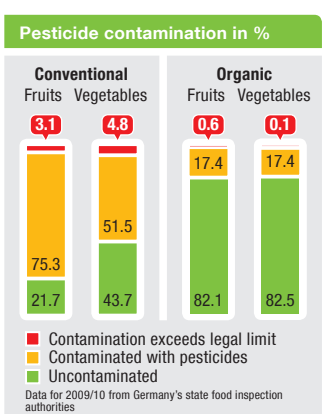
Protection through Greenpeace

As early as 2005, Greenpeace introduced an evaluation system that took multiple contamination into account by adding up all limits to arrive at a total limit value. This evaluation system is rigorously based on the precautionary principle and in 2012 it was adjusted to include current research findings (see page 19).

Uncontaminated organic products

Only a few pesticides have approval for use in organic farming – their active ingredients are natural substances. These are much less harmful to health than the synthetic chemical pesticides used in conventional agriculture.
Moreover, organic farmers use beneficial insects, apply mechanical methods for weed control, and carefully manage optimal crop rotation. In this way, they boost soil fertility, which is essential for feeding humanity. The natural environment, groundwater, and the quality of food all benefit as well.

Official food testing and Greenpeace analyses show that fruits and vegetables cultivated observing organic standards can be produced with



Immensely useful – ladybirds feed on aphids

almost no pesticide residues. When pesticides are found, concentrations are usually very low (below 0.01 mg/kg) and considered harmless, even according to Greenpeace's particularly critical evaluation system.

These traces of pesticides can be carried by wind (drift) or water (runoff) from neighbouring conventionally farmed fields to organically cultivated fields. But even organic farming can be further improved. Copper-bearing agents to resist fungal attack damage soil organisms, and should be used far less. More effective controls and greater transparency are needed in international trade to prevent conventionally cultivated produce from being sold as organic.

Fruit and vegetable consumption in Germany

	Total	Per person
Vegetables	7.55 million t	92.4 kg
Potatoes	5.36 million t	65.6 kg
Fruits	5.36 million t	65.6 kg

How to avoid pesticides

When purchasing and preparing fruits and vegetables, you should keep the following in mind:

1 Organic produce is our first recommendation.

Organic farming generally does not use synthetic chemical pesticides. Toxic residues are the exception, and pesticide cocktails are very rare. For this reason, babies and small children should be given only organic products to eat. Please note that Fair Trade products are guaranteed organic products only when they are labelled as such.

2 Watch out for the kind of fruit and its country of origin.

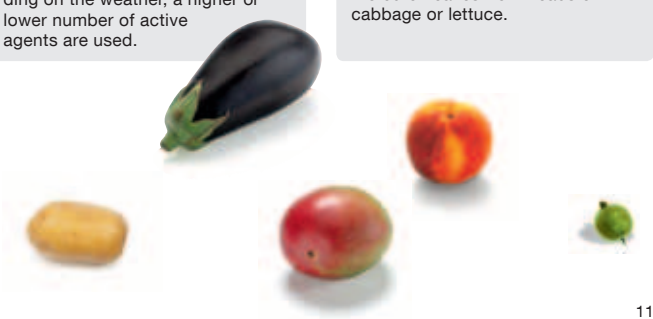
About 70 percent of the fruits and vegetables sold in Germany are imported. Depending on the country of origin, fruits may have been subjected to a large number of different pesticides. It is best to buy fruits and vegetables in season from your own region.

3 Note the time of harvest.

Many conventionally grown fruits and vegetables such as bell peppers and tomatoes are sprayed with pesticides more heavily at the start of the harvesting season than later. This is done to accelerate the ripening process, so that depending on the weather, a higher or lower number of active agents are used.

4 Rinse fruits and vegetables under lukewarm running water.

This can eliminate at least some of the pesticides. Wash your hands after peeling citrus fruits, bananas or mangos. Otherwise contaminants in peels could be easily ingested. It is advisable to remove the outer leaves from heads of cabbage or lettuce.



Test results

Tables with information on popular fruits and vegetables from conventional cultivation are presented on the following pages; they show levels of pesticide contamination that vary from country to country.

How were products rated?

Organically grown fruits and vegetables can generally be recommended without reserve. Regarding fruits and vegetables from conventional farming, Greenpeace analysed all available data from Germany's state food inspection authorities and from its own pesticide testing in 2009 and 2010; this data was subjected to new evaluation under more rigorous criteria in 2012. The evaluation of individual samples was used to determine overall ratings according to country of origin, kind of produce and place of purchase.

The overall evaluation

The following criteria were used to rate conventionally grown fruits and vegetables:

Green: limited recommendation

... more than 50 % of individual samples were evaluated as ‚green' and a maximum of 10 % of samples were evaluated as ‚red' = not recommended.

Yellow: caution is advised

... up to 50 % of individual samples were evaluated as ‚green' and a maximum of 33 % of samples were evaluated as ‚red' = not recommended.

Red: not recommended by Greenpeace for precautionary reasons

... more than 33 % of individual samples were evaluated as ‚red' = not recommended.

For information on the evaluation of individual samples see page 19.

Fruits

	Limited recommendation	Evidence of pesticides	Not recommended by Greenpeace
Apples		Argentina, Brazil, Chile, Germany, France, Italy, New Zealand, Netherlands, South Africa	Austria
Apricots		Germany, France, Italy, Spain, Turkey, Hungary	Greece
Asian pears (nashi pears)		China	
Bananas	Dominican Republic		Costa Rica, Ecuador, Colombia, Panama
Blueberries	Germany		
Carambola (starfruit)		Malaysia	
Clementine oranges			Italy, Spain
Currants (red and black)		Germany	
Figs		Turkey	
Grapefruits		Mexico, USA	Israel, Spain, South Africa, Turkey

Fruits

			
Gooseberries		Germany	
Grapes (table varieties)		Egypt, Argentina, Brazil, Greece, Italy, Namibia, Spain, South Africa	Chile, Germany, India, Turkey
Kiwis	Chile, Greece, New Zealand	France, Italy	
Lemons		Spain	
Lichees	Madagascar		
Limes			Brazil
Mandarine oranges			Spain
Mangos	Pakistan	Brazil, Peru	Thailand
Maracuja/ passion fruit		Colombia	
Melons		Brazil, Costa Rica, Spain	
Morelo cherries		Germany	
Nectarines		France, Italy, Spain	Chile
Oranges		Italy	Argentina, Greece, Spain, South Africa
Papayas		Thailand	Brazil

Fruits

			
Peaches		France, Greece, Italy, Spain	
Pears		Argentina, Belgium, Germany, France, Netherlands, Spain	Chile, Italy, South Africa, Turkey
Physalis	Colombia		
Pineapples		Costa Rica	Ghana
Pitayas (dragon fruit)			Vietnam
Plums	Germany, Spain	Chile, Italy, South Africa, Hungary	
Pomegranates	Spain	Turkey	
Pomelos		China	
Raspberries		Germany, Portugal, Spain	
Sharon fruit	Israel, Spain, South Africa		
Strawberries		Egypt, Belgium, Germany, Greece, Italy, Morocco, Netherlands, Spain	
Sweet cherries		Chile, Germany, France, Greece, Italy, Spain, Turkey	

Vegetables

	Limited recommendation	Evidence of pesticides	Not recommended by Greenpeace
Asparagus	Germany, Greece, Peru, Spain		
Aubergines	Germany	Netherlands, Spain, Thailand, Turkey	
Basil			Thailand
Bell peppers	Germany, Israel, Hungary	Greece, Morocco, Netherlands, Spain	Turkey
Broccoli	Germany, Italy, Spain		
Brussels sprouts		Germany, Netherlands	
Butterhead lettuce		Germany	Belgium, Italy, Netherlands
Carrots		Belgium, Germany, Italy, Netherlands, USA	Spain
Cauliflowers	Germany, France		
Celeriac		Germany, Netherlands	
Chicory		Germany	
Chili peppers			Thailand
Chinese cabbage	Germany		

Vegetables

			
Courgettes	Germany, Netherlands	Spain	Turkey
Curly kale		Germany	
Cucumbers	Germany	Belgium, Greece, Netherlands, Spain	
Endive		Germany, Italy	
Gherkins	Germany		
Green beans	Netherlands	Germany, Egypt, Kenya, Spain, Morocco	Dominican Republic, Thailand
Iceberg lettuce	Germany	Netherlands, Spain	
Kohlrabi	Germany, Italy, Spain		
Lamb's lettuce		Germany, Belgium, France	
Leeks		Belgium, Germany, Netherlands	
Lollo bianco lettuce		Germany	
Lollo Rosso lettuce		Germany, Italy	
Oak leaf lettuce		Germany	

Vegetables

			
Okras			India
Onions	Germany		
Parsley	Germany		
Potatoes	Germany, Israel	Egypt, Cyprus	France
Radishes	Germany		
Red beets	Germany		
Red cabbage	Germany		
Rhubarb	Germany		
Rocket		Germany, Italy	
Savoy cabbage	Germany		
Snow peas			Kenya
Spinach	Germany, Italy		
Tomatoes	Germany	France, Belgium, Israel, Italy, Netherlands, Spain, Turkey	Morocco
White cabbage	Germany		
White mushrooms	Germany, Netherlands	Poland	

For the above lists, data for 2009 and 2010 from Germany's state food inspection authorities and from Greenpeace's own pesticide tests were used; there were at least 10 samples per crop and country.

Greenpeace evaluation system

What is the source of data?

Greenpeace evaluated data from Germany's state food inspection authorities and the results of its own pesticide testing in 2009 and 2010; this encompassed more than 22,000 samples from about 80 countries. In particular, fruits and vegetables with high per capita consumption, and those which were already conspicuous because of high contamination, were evaluated. Nearly two-thirds (61.1 percent) of all tested plant foods came from Germany (38.5 percent), Spain (13.6 percent) or Italy (9.1 percent).

Information is available on the place of purchase for about 30 percent of samples. Of this 30 percent, 39 percent were bought in supermarkets and discount food stores belonging to big national retail chains, 58.9 percent came from other retailers and wholesalers, and the remaining samples (2 percent) were purchased in local supermarket chains or health food stores.

Evaluation of individual samples

In 2005, Greenpeace first developed its own system for evaluating pesticide residues in fruits and vegetables. The evaluation system was revised for the new shopping guide, based on current studies of consumption.1

Greenpeace believes that legal limits for pesticides should be adjusted to provide a safe level of protection for the most sensitive population groups. For this reason, additional precautionary factors were incorporated into its 2012 evaluation system.

The Greenpeace 'traffic light' represents the rating of individual samples:

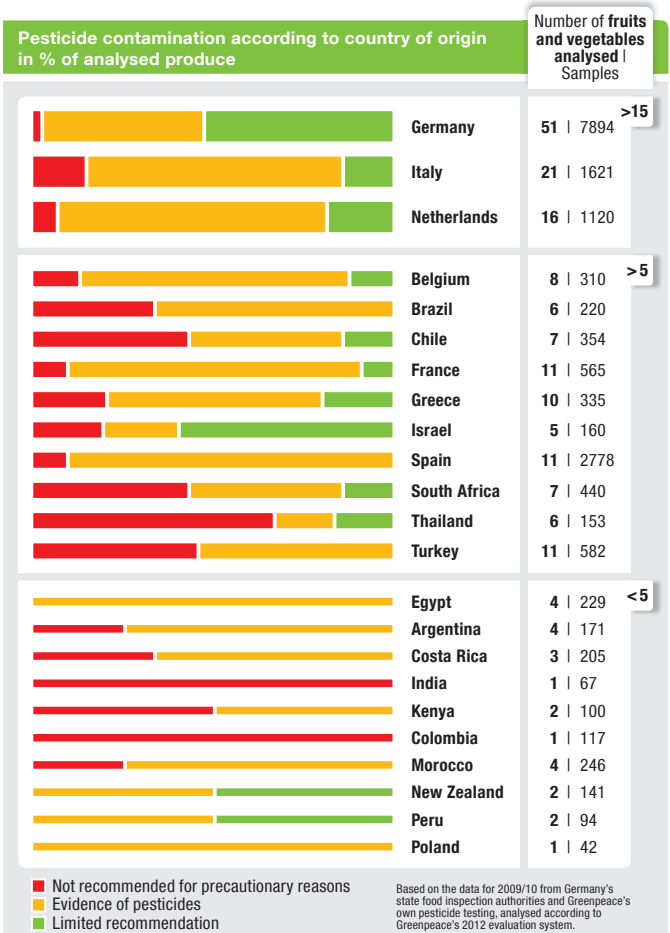
Green (unlimited recommendation): The pesticide residues found in the laboratory did not exceed 0.01 mg/kg. This can be the case for both organically and conventionally grown produce.

Yellow (contains pesticide residues): Pesticide levels of more than 0.01 mg/kg were found.

Red (not recommended): One or more of the following criteria was met:

- The measured concentration of a pesticide was higher than the legal limit for that substance.
- The measured concentration of a pesticide exceeded the toxicologically derived acute reference dose (ARfD) or the acceptable daily intake (ADI) value used in official risk assessments.
- There was multiple contamination and at least one of the following criteria was met:
  – The sum of the maximum legal limits of all pesticides found was above 100 percent.
  – The sum of the ARfD and/or ADI values for individual pesticides was greater than 100 percent; during the rating process, Greenpeace used additional precautionary factors of 10 for the ARfD and 20 for the ADI value (see www. greenpeace.de/pestizide). Many scientists believe that conventional evaluation factors are not sufficient to protect young children, pregnant women and people who are ill. Weak or not yet fully formed organisms have a significantly more sensitive reaction to harmful substances.

Countries at a glance



Notes

[1] To view the background paper and find more information on Greenpeace's evaluation system, please visit www.greenpeace.de/pestizide.

[2] Geiger F, et al: Persistent negative effects of pesticides on biodiversity and biological control potential on European farmland. Basic and Applied Ecology (2010), doi: 10.1016/j.baae.2009.12.001

Greenpeace demands that

Supermarkets:

- do not sell fruits and vegetables contaminated with pesticides
- increase by 15 percent every year the foods produced in an ecologically sound and fair way

Farmers and the food trade:

- stop using particularly hazardous pesticides such as those on the Greenpeace Black List

National and state governments:

- immediately take into account multiple contamination with pesticide residues during the risk assessment of food
- launch a programme to cut the use of pesticides in half within 10 years
- comprehensively subsidise methods for non-chemical crop protection
- install effective food inspection
- ban particularly hazardous pesticides, including substances that affect the hormone system

Greenpeace is an international environmental organisation that campaigns in non-violent actions to protect Earth's life support base. It is above party lines, politically and financially independent, and does not accept funds from governments, parties or industry. More than half a million people in Germany donate to Greenpeace, ensuring that we can continue our daily work to protect the environment.