German Federal Institute for Risk Assessment

FAQ

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Preparing (Green) smoothies: what should be considered

Although green smoothies essentially consist only of fruit, vegetables, and herbs, there are a few things that should be borne in mind when preparing them, especially if vegetables and herbs are blended that are normally eaten after heat-processing – or that are not eaten at all. As a rule, only ingredients that are usually eaten raw should be mixed. As with all foods, smoothies should be consumed in moderation as part of a varied diet. This is the best way to supply the body with the different nutrients and to prevent the biased exposure to a variety of potentially harmful substances. The German Federal Institute for Risk Assessment (BfR) compiled frequently asked questions (FAQ) on this topic.

Which fruits and vegetables are suitable for smoothies?

Smoothies prepared from fruit and vegetables can, if consumed in moderation, make a valuable contribution to a healthy and balanced diet. In general, only those parts of the plant that are also usually consumed raw (and for which the consumption can be considered safe) should be used to prepare smoothies.

Especially high-fibre and/or brassica vegetables can cause digestive problems in sensitive people and when consumed in large quantities – especially if they are eaten raw. One reason for this is that carbohydrates that are indigestible for humans can be decomposed by bacteria in the intestine, thereby forming gases that cause flatulence.

With regard to nutrition, the BfR generally advises variety and diversity in the choice of food. In this way, a biased exposure to potentially harmful substances, whose occurrence must always be expected, can be prevented. A varied diet also ensures a sufficient supply with various nutrients.

Can leaves, stems, peels, and seeds also be used in smoothies?

With respect to the appropriateness for preparing smoothies using plant parts that are not regularly consumed (e.g. seeds, stems, or peels) no generally admitted advice is possible. Ingredients of health concern can occur in different amounts in different parts of the plant. Therefore, when preparing smoothies, only plants (or plant parts) that are usually eaten raw should be used. An example of this would be celery stalks. It should also be considered that

leaves and stems, in some cases, may contain higher levels of pesticide residues or environmental contaminants than other plant parts. Maximum levels apply for pesticide residues and some contaminants. However, these often have been set and are monitored only for the parts of the plant that are commonly consumed.

What should be taken into account when using apricot kernels and bitter almonds in smoothies?

Bitter apricot kernels and bitter almonds contain cyanogenic glycosides (including amygdalin), which can release toxic cyanide. This causes acute poisoning if larger quantities are ingested. On the other hand, smaller doses can be detoxified quite effectively by the human body. The BfR therefore advises adults not to consume more than two apricot kernels or one bitter almond per day or even better, to avoid its consumption, and children should not consume these seeds at all.

Can wild herbs be safely used in smoothies?

When using self-picked wild herbs, there are a few things that need to be considered. In particular, you should be informed prior to collecting the plants of choice. Some wild herbs contain substances that are harmful to health and should therefore either be consumed only in small quantities or not at all. Examples include borage, coltsfoot and comfrey. Another risk is the likelihood of confusion. For example, confusing of wild garlic with leaves of lily of the valley or meadow saffron, but also confusing of cows parsley or yarrow with poison hemlock can lead to severe – or even fatal – poisoning.

Is raw spinach in green smoothies a health concern?

Spinach contains different amounts of nitrate and oxalic acid depending on the growing conditions. Oxalic acid can form complexes of low solubility with minerals such as calcium. A permanently high intake of oxalic acid can therefore lead to a deficiency of these minerals and increase the risk of kidney, ureter, or bladder stones in vulnerable individuals.

Nitrate itself is harmless. However, it can be converted into nitrite, which can lead to impaired oxygen transport through the red blood cells and cause a lack of oxygen in the tissues. Daily consumption of large amounts of raw spinach with high levels of oxalic acid and nitrate could result in intake levels that may pose a health risk. Unified maximum levels for nitrate apply in the EU in various leafy vegetables such as spinach and fresh salads. Nevertheless, these foods contribute to a generally high nitrate intake. In general, the BfR advises variety and diversity in the diet. In this way, you can prevent biased exposure to a variety of potentially harmful substances.

https://www.bfr.bund.de/en/frequently_asked_questions_on_nitrate_and_nitrite_in_food-241910.html

Are smoothies suitable for a calorie-restricted diet?

Smoothies with a high fruit content in particular can have a high sugar content and thus a high energy density. Some commercial ready-to-drink products have a sugar content comparable to that of soft drinks. Such smoothies are therefore not suitable for a calorie-restricted diet.

Why should you always prepare smoothies fresh?

In principle, freshly prepared smoothies should be consumed as quickly as possible. The BfR does not recommend storing in the refrigerator for a longer time period – mainly for reasons of food hygiene.

Should the fruit and vegetables for smoothies be cleaned beforehand?

Thorough cleaning of vegetables and lettuce is generally advisable. In this way, dirt and impurities (including potentially harmful microorganisms, environmental contaminants and pesticide residues) can be effectively reduced.

Do smoothies contribute to satiety?

Extent and duration of the satiating effect depend on various factors. Among other things, the gastric fill and gastrointestinal transit time play a role here. Also chewing solid food indirectly leads to a satiating effect. For these reasons, the satiating effect is usually less pronounced and less long-lasting after consuming liquid or semi-solid foods than after solid foods.

Further information on the BfR website

Grass and leaf products for consumption may be contaminated with human pathogenic bacteria
https://mobil.bfr.bund.de/cm/349/grass-and-leaf-products-for-consumption-may-be-contaminated-with-human-pathogen-bacteria.pdf

Two bitter apricot kernels per day are the limit for adults. Children should refrain from consuming apricot kernels altogether
https://www.bfr.bund.de/cm/349/two-bitter-apricot-kernels-per-day-are-the-limit-for-adults-children-should-refrain-from-consuming-apricot-kernels-altogether.pdf

Food hygiene – general information
https://www.bfr.bund.de/en/food_hygiene-54339.html

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. The BfR advises the Federal Government and the States ('Laender') on questions of food, chemicals and product safety.
The BfR conducts independent research on topics that are closely linked to its assessment tasks.

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Publisher:
German Federal Institute for Risk Assessment
Max-Dohrn-Straße 8-10
10589 Berlin, Germany
T +49 30 18412-0
F +49 30 18412-99099
bfr@bfr.bund.de
bfr.bund.de/en

Institution under public law
Represented by the president Professor Dr Dr Andreas Hensel
Supervisory Authority: Federal Ministry of Food and Agriculture
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