German Federal Institute for Risk Assessment

FAQ

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Food supplements for children - (not) a good idea?!

Many parents are concerned about their children's dietary preferences: their offspring enjoy eating pasta or chips, but often grimace at carrots or broccoli - regardless of the fact that vegetables and fruit are important components of a healthy nutrition and essential for an adequate supply of vitamins, minerals and other valuable substances.

Food supplements offer a seemingly simple solution in such situations: the missing vitamins and minerals are administered in the form of pills or drops; this soothes the conscience of sometimes desperate parents. A large number and variety of such products are available, including those specially tailored to the target group of children. Advertising implies that food supplements can not only compensate for a supposed lack of nutrients, but also have a positive effect on health, such as strengthening the immune system, promoting performance or generally favouring growth and development.

According to the German Federal Institute for Risk Assessment (BfR), such supplements are unnecessary for healthy people, with a few exceptions. They are also no substitute for a balanced and varied diet. This applies to adults as well as to children.

Children in Germany are adequately supplied with most nutrients. However, food supplements for this target group in particular are often very high in dosage, and there are currently no binding provisions for maximum levels of vitamins, minerals or other substances in food supplements. There is also a lack of reliable data on the health safety of some of the substances used. This applies in particular to many other substances with a nutritional or physiological effect that are added to certain food supplements.

If there is concern that the supply of nutrients might not be sufficient, this should be clarified by a physician before the child is given food supplements independently.

What are food supplements anyway?

Food supplements are foodstuffs. They are intended to supplement the general diet. Food supplements can contain a wide range of micronutrients and/or other substances with a nutritional or physiological effect. These can be, for example, vitamins, minerals, amino acids, fatty acids, dietary fibres or plant extracts, which are added either individually or in combination in concentrated form. Food supplements are offered in dosed form, for example as tablets, capsules or coated tablets, but also as powders and liquids for intake in small, measured quantities. Unlike other foods, food supplements are labelled with, among other things, a recommended intake and carry further specific instructions for consumers, e. g. that they should be stored out of the reach of small children and that they should not be used as a substitute for a varied diet. By definition, the ingredients of food supplements must not have a pharmacological effect. If such a product has pharmacological effects, it is a medicinal product (drug) that is subject to authorisation. Further general information on food supplements can be found in our FAQ on the subject.

Are there food supplements specifically for children?

The range of food supplements on offer in drugstores, supermarkets and pharmacies is large and often confusing. Dozens of substances are offered individually or in combination with others; the dosages vary from product to product. Moreover, certain products are also available that are specifically aimed at the target group of children in terms of presentation or dosage form and sometimes also with corresponding age information. For example, some products are offered in colourful packaging or as fruit gums, e. g. in the shape of bears. The products suggest an inadequate supply of micronutrients for children and are sometimes also advertised, for example, as promoting performance, children's development in general or as strengthening the immune system.

Do children need food supplements?

Overall, the data available in Germany indicate that children's nutrient intake and supply is good. Food supplements are therefore generally not necessary for healthy children. If there are concerns that a child's nutrient supply is inadequate, this should be clarified by a physician before resorting to food supplements.

Exceptions to this are the supplementation of vitamin D recommended for infants by paediatric societies to prevent rickets and of fluoride to prevent tooth decay (until teeth break through). These two substances are available in Germany as medicines for infants in the correct dosage and are often offered in combination.

In principle, a varied diet with plenty of fruit and vegetables not only provides essential nutrients, but also other valuable ingredients, such as dietary fibre or secondary plant substances. Food supplements containing individual substances in isolated form are not an equivalent substitute.

Several large studies have investigated how well or poorly children in Germany are supplied with vitamins and minerals and how much of these substances they take in with their usual diet.

In the EsKiMo II study, for example, the vitamin and mineral intake of children and adolescents between the ages of 6 and 17 was determined. The results showed that the median vitamin D and iodine intake in all age groups analysed and the median iron intake in

girls aged 12 and over was below the intake recommendations of the German Nutrition Society (DGE).

In the case of vitamin D, however, it must be taken into account that most foods naturally contain only very small amounts of the vitamin and that the contribution of the diet to vitamin D supply is therefore low. Vitamin D is mainly produced in the skin under the influence of sunlight. The DGE's intake recommendations for vitamin D refer to cases in which the skin does not produce vitamin D itself. Therefore, biomarkers (serum concentration of 25-hydroxyvitamin D), which reflect both dietary intake and endogenous synthesis of vitamin D, should also be used to assess the supply of this vitamin in particular. Corresponding data is available from the KiGGS Wave 2 (Study on the Health of Children and Adolescents). According to this study, around 54% of children and adolescents up to the age of 17 (averaged across all age groups of children and adolescents) are sufficiently supplied with vitamin D. This corresponds to around 40 to 80 % of children and adolescents, depending on the individual age groups. In contrast, around 12.5% (averaged across all age groups of children and adolescents) have an increased risk of vitamin D deficiency. You can find more information on vitamin D, for example, in our FAQ on vitamin D or in our proposal on maximum amounts of vitamin D in food, including food supplements.

Data from the VELS and GRETA studies are available for children aged 0.5 to 5 years, which show a similar picture of the intake situation as the EsKiMo II data for older children aged 6 to 17 years.

With all the study results, it must be taken into account that the actual need for vitamins and minerals varies from person to person. If studies show that vitamin or mineral intake is below the reference value for this nutrient specified by the DGE for the population, this does not automatically equate to deficiency for individual people.

How can I find out how well my child is supplied with vitamins or minerals?

A blood test can determine whether the supply of vitamins and minerals is satisfactory. Parents should consult a paediatrician if they have any questions about their child's nutrition and if they suspect that their child's supply of important micronutrients is inadequate.

What health risks are associated with taking food supplements, especially for children?

When it comes to the supply of vitamins and minerals, the following should be considered: According to current knowledge, taking more vitamins and minerals, i. e. in excess of what is needed, does not bring any further health benefits. An extra dose of vitamin C via food supplements for example has no further health benefits if the requirement is already covered by a normal diet. Or to put it another way: more does not help more.

In unfavourable cases, however, an excessive intake of vitamins and minerals is not only unnecessary, but can also be harmful to health. For example, long-term excessive intake of vitamin D can lead to increased calcium levels in the blood and, in particularly severe cases, damage the kidneys. Such cases have been documented for children (see here, in German only: https://www.akdae.de/arzneimittelsicherheit/bekanntgaben/newsdetail/vitamin-d3-ueberdosierung-bei-einem-saeugling-aus-der-uaw-datenbank). In the worst case, the desire to do something good for your child can therefore turn into the opposite.

It should also be borne in mind that children differ from adults - the younger they are, the more pronounced are the differences. Due to their growth, they have a higher energy

requirement, and also a child's metabolism is not comparable to that of adults. For example, some substances are metabolised more quickly, others more slowly. In general, due to the different metabolic activity of children and adults, the dosage of food supplements recommended for adults cannot simply be reduced, based on estimations at your own discretion, to meet the needs of children.

Other special aspects of child development must also be taken into account. For example, taking food supplements containing melatonin, which are advertised as a sleep aid, may pose different health risks for children than for adults. In principle, the data available on safety-relevant aspects of melatonin intake in healthy children and adolescents, particularly with regard to long-term use, is currently very limited. Among other things, it is still unclear to what extent melatonin could influence hormonally controlled processes such as children's longitudinal growth or pubertal development. The BfR therefore recommends that children and adolescents should not be given food supplements containing melatonin.

Accidental ingestion of food supplements by children poses a particular risk to health if the dosage form of the products is specially tailored to children. Some products are available in the form of colourful fruit gums, for example, which can easily be mistaken for sweets. Parents should be aware that the colourful pills or gum bears are not as harmless as they look, but contain substances that may cause negative health effects if overdosed.

What can be said about the dosage of the available food supplements?

Basically, it should be noted: Unlike medicinal products, food supplements do not require authorisation; they are therefore not assessed by the authorities before they are placed on the market. The manufacturers and distributors are responsible for the safety of the products and for compliance with food law regulations. You can find more information on the legal provisions here.

In March and April 2023, the consumer centres in Germany repeated a market check for children's food supplements (see here, in German only: https://www.verbraucherzentrale.de/sites/default/files/2023-08/2023_07_10_marktchecknem-fuer-kinder-2023.pdf) from 2018. Among other things, the dosage of the products was assessed with regard to the intake reference values derived for vitamins and minerals by the D-A-CH societies (competent professional societies for nutrition from Germany, Austria and Switzerland).

In the consumer centres' sample, the intake reference values for 4 to 7-year-olds were exceeded in more than two thirds of the food supplements offered specifically for children. More than a third of the products exceeded the maximum levels proposed by the German Federal Institute for Risk Assessment for vitamins and minerals in food supplements, although these were derived for adolescents aged 15 and over and adults and are therefore not actually applicable to children aged 4 to 7.

The Chemical and Veterinary Investigation Office (CVUA) (see here, in German only: https://www.ua-bw.de/pub/beitrag.asp?subid=2&Thema_ID=2&ID=3837&lang=DE&Pdf=No%22%20\t%20%22_blank) in Karlsruhe also analysed food supplements for children between 2021 and 2023. 19 of the 31 samples were explicitly intended for infants and young children - and were all

assessed by the authority as being not marketable. The reasons for this were a misleading presentation, the use of additives not authorised for these products or an exceedance of the recommended daily intake values. The latter is particularly problematic for infants and small children.

Can food supplements be a compensation if my child is a "picky eater"?

Many children are fussy eaters, at least from their parents' point of view. Vegetables and fruit in particular - important suppliers of vitamins and minerals and components of a healthy diet - are not eaten that readily by many children. The idea of giving children the - supposedly missing - micronutrients in the form of food supplements is an obvious one. However, products that contain individual substances in isolation cannot replace a balanced diet. In addition to essential nutrients, conventional foods provide numerous other valuable ingredients such as dietary fibres or secondary plant components.

How can I provide my child with sufficient nutrients?

According to scientific studies, children in Germany are generally well supplied with vitamins and minerals. Only some micronutrients are not consumed at the amounts recommended by scientific societies. This applies, for example, to the vitamin folate or the trace element iodine and, in some groups of children, also to iron, potassium or calcium.

If you want to improve your child's supply, you can offer more foods that are rich in these substances. Folate is found in spinach, oranges or pulses, for example, but also in eggs. Calcium is mainly found in milk and dairy products, while iron is found in meat, poultry and sausages as well as in pulses. The supply of vitamin D can be improved if you regularly and sufficiently expose your skin to sunlight - ideally by getting plenty of outdoor exercise.

Further information on this can be found on the BfR's internet portal mikroco-wissen.de/en.

My child eats a vegetarian diet - does he or she need additional vitamins?

A balanced vegetarian (ovo-lacto-vegetarian) diet, i.e. nutrition based on vast amounts of plant-based foods as well as eggs, milk and dairy produce (without meat), can ensure an adequate supply of nutrients in kids. Particular attention should be paid to an adequate iron intake. Vitamin B12 supply can be ensured by consuming milk and dairy products.

What should be considered with vegan nutrition?

Some important micronutrients are found almost exclusively in animal products, e. g. vitamin B12. As vegans do not eat any animal products, a vegan diet without fortified foods or nutrient supplements bears a high risk of inadequate supply of some nutrients. This can have serious health consequences, especially for children. For this reason, the German Society for Nutrition (DGE), for example, does not recommend a vegan diet during sensitive phases of life (such as pregnancy and breastfeeding, as well as infancy, childhood and adolescence). Find more information here (in German only).

My child spends very little time outdoors. Should I fear a vitamin D deficiency?

According to studies, the concentration of vitamin D is in the suboptimal range in around 33 per cent of children and adolescents. This is the case when the blood serum concentration of the marker for vitamin D supply (25-hydroxyvitamin D) is between 30 and under 50 nanomoles (nmol)/litre (L). Around 12.5 per cent of children and adolescents (averaged

across all age groups) have a vitamin D deficiency; their blood serum 25-hydroxyvitamin D concentration is below 30 nmol/L.

The easiest way to improve the vitamin D supply is to regularly expose the skin to sunlight, as vitamin D can be formed in the skin under the influence of sunlight. With sufficient sunlight exposure, the body's own production contributes to 80 to 90 per cent of the vitamin D supply. It is recommended to expose face, hands and arms to the sun uncovered and without sun protection for a few minutes two to three times a week. However, sunburn should always be avoided. However, the amount of sunlight in this country in autumn and winter is not sufficient to produce enough vitamin D through the skin. If you are concerned that your child may have a vitamin D deficiency, you can have a blood test carried out by a physician to check whether the supply is sufficient.

Preparations containing vitamin D should not be administered to children without medical clarification. There are case reports of vitamin D intoxication and resulting hypercalcaemia in children, due to the uncontrolled intake of extremely high doses of vitamin D supplements. Typical symptoms of such elevated calcium levels in the blood serum range from fatigue and muscle weakness to vomiting and constipation to kidney damage, cardiac arrhythmia and vascular calcification.

My child does a lot of sport. Doesn't it need an extra portion of vitamins and minerals?

For children and young people who do sport, it is particularly important to have a balanced diet that meets their needs. Food supplements are no substitute for this. Apart from certain products that can be useful to cover energy, carbohydrate or fluid/electrolyte requirements during increased exertion in endurance sports, food supplements should only be taken if a nutrient deficiency has been medically proven or adequate nutrient intake cannot be ensured in any other way.

Are there legally defined maximum amounts for the ingredients in food supplements?

In order to limit health risks resulting from an oversupply of vitamins and minerals through their supplemental consumption in addition to their intake via a normal diet, the EU regulations for food supplements and fortified foods call for harmonised maximum levels for vitamins and minerals in these products to be set at the EU level. As yet, however, such maximum levels have not been established. The German Federal Institute for Risk Assessment (BfR) elaborated corresponding recommendations for maximum levels in 2004, which were further updated in 2021. Regarding food supplements, the BfR has, with a few exceptions, derived maximum levels only for adolescents aged 15 and over and for adults (click here for more information on BfR's proposed maximum levels).

The addition of "other substances with a nutritional or physiological effect" is also permitted in food supplements. However, it is not regulated exactly which substances these may be. There is no positive list of authorised substances. Only the European Regulation regarding the addition of vitamins, minerals and certain other substances to foods (which also applies to food supplements) includes a rudimentary Annex III, which lists "other substances" whose use in food is prohibited (Part A) or restricted (Part B) or under scrutiny by the European Community (Part C). So far, this annex contains only very few substances. This means that there is no legal regulation for most substances currently used in food supplements that are not vitamins or minerals. Maximum levels have only been set for the few substances that have been included in Part B of Annex III - currently: green tea extracts containing (-)-

epigallocatechin-3-gallate, monacolins from red mould rice, and trans fatty acids formed during the industrial processing of food. For the first two, it has been stipulated that they should not be consumed by children under the age of 18.

How are food supplements for children regulated by law?

In Germany, the Food Supplements Ordinance (NemV) regulates the legal aspects relating to food supplements. It is based on the requirements of European Directive 2002/46/EC, which lists vitamins and minerals (in Annex I) and compounds (in Annex II), that may be added to food supplements. There are no restrictions on specific age groups in the NemV. This means that food supplements for children are not prohibited, but are not specifically regulated either.

According to the NemV, a food supplement may only be placed on the market if the packaging contains information on the categories of nutrients or other substances it contains or an indication of the characterisation of these and the recommended daily intake in portions of the product. Furthermore, the manufacturer must state that the recommended daily intake must not be exceeded, that food supplements should not be used as a substitute for a balanced diet and that the products should be kept out of the reach of small children. Health claims are generally prohibited unless they have been included in the list of authorised claims in accordance with Articles 13 and 14 of the Health Claims Regulation [Regulation (EC) No. 1924/2006] following a scientific review by the European Food Safety Authority (EFSA).

Food supplements are not subject to authorisation in the EU; this means that they do not have to be assessed or approved before being placed on the market. For Germany, they must be notified to the Federal Office of Consumer Protection and Food Safety (BVL) in accordance with the NemV. Manufacturers and distributors are responsible for the safety of the products and for compliance with food law regulations. In Germany, it is the task of the food monitoring authorities of the German federal states ("Laender") to monitor the food supplements on the market and the manufacturing companies.

Further information on food supplements

Questions and answers on food supplements
https://www.bfr.bund.de/cm/349/frequently-asked-questions-on-food-supplements.pdf

Updated recommended maximum levels for the addition of vitamins and minerals to food supplements and conventional foods
https://www.bfr.bund.de/cm/349/updated-recommended-maximum-levels-for-the-addition-of-vitamins-and-minerals-to-food-supplements-and-conventional-foods.pdf

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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