German Federal Institute for Risk Assessment

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Lugol's solution is not a solution for improving the iodine status

Preparations marketed online for use as food supplements pose health risks

Particularly on social media and online portals, products are sometimes offered as food supplements even though their ingredients are not suitable for human consumption. These are claimed to alleviate potential nutrient deficiencies or health problems. One product currently being heavily promoted is so-called Lugol's solution – an elemental iodine-potassium iodide solution that has historically been used to disinfect external wounds and is still applied as a laboratory chemical for starch detection.

Lugol's solution is not intended for human consumption and does not meet the requirements set in the EU and in Germany for foods, including food supplements. Ingesting this solution can lead to iodine poisoning and associated serious adverse effects on thyroid function.

The iodine content of Lugol's solution is exceptionally high. A single drop of a 5% solution contains more than 6,000 micrograms (µg) of iodine. Even ingesting this very small amount can therefore lead to a significant exceedance of the recommended daily iodine intake for adults of 150 µg per day. Furthermore, just one drop of the solution exceeds the Tolerable Upper Intake Level (UL) of 600 µg per day for adults, as derived by the European Food Safety Authority (EFSA) for iodine intake from all sources, by a factor of approximately ten. Such an excessive intake of iodine can cause severe impairment of thyroid function.

Although iodine is an essential trace element, and iodine intake in Germany needs to be improved, Lugol's solution should under no circumstances be used for improving the iodine supply.

The German Federal Institute for Risk Assessment (BfR) recommends that food supplements marketed for people aged 15 and over and adults should not contain more than 100 µg of iodine (preparations for pregnant and breastfeeding women: 150 µg of iodine) per daily dose. This amount allows for supplemental intake of a

sufficient amount of iodine when needed and prevents potential adverse effects caused by excessive iodine intake.

Lugol's solution is an aqueous solution containing elemental iodine and potassium iodide. Iodine is an essential trace element and indispensable for the production of thyroid hormones, which in turn help regulate key processes in the body. These include energy expenditure and basal metabolism, growth and development of the child and the foetus, body temperature, the cardiovascular system, blood pressure, physical and cognitive performance , digestive function and mood.

Both a deficiency and an excess of iodine can have negative health consequences. If iodine intake is insufficient over a prolonged period of time, it can lead to hypothyroidism. Symptoms such as fatigue, weight gain and an enlarged thyroid gland (goitre) may occur. Conversely, an excess of iodine can lead to hyperthyroidism in patients with an existing thyroid disorder (e. g. Graves' disease). In individuals with a healthy thyroid, excessive iodine intake can cause a temporary blockage of thyroid hormone production, which usually resolves within a few days. In certain conditions, such as Hashimoto's thyroiditis, or in the unborn child, the blockage may however persist, leading to hypothyroidism.

The German Nutrition Society (DGE) recommends a daily intake of 150 µg of iodine through nutrition for people aged 13 and over. Although iodine intake in Germany has improved since the mid-1980s – partly due to the use of iodised table salt – around one third of adults and 45 % of children in Germany are at increased risk of iodine deficiency.

People who regularly consume iodine-rich foods such as fish and milk (and dairy products) and use iodised salt at home generally have an adequate iodine intake. However, according to the BfR, people who avoid milk, dairy produce and fish – for example, due to a vegan lifestyle – as well as pregnant and breastfeeding women, should monitor their iodine intake and, if necessary, seek medical advice on the possibility of supplementing iodine.

Anyone wishing to supplement iodine should opt for food supplements containing no more than 100 µg (150 µg for pregnant and breastfeeding women) of iodine per daily dose in the form of sodium or potassium iodate or iodide. The BfR recommends this as a maximum amount to ensure that consumers can supplement their diet with an appropriate amount without taking up too much iodine. For supplementation, one should use food supplements that are regularly available on the market and comply with the requirements of the Food Supplements Regulation. Other preparations that have recently been promoted, particularly on social media, such as Lugol's solution for iodine intake, pose significant health risks.

Further information:

BVL communication (in German only): Lugolsche Lösung ist kein Lebensmittel

Further information on micronutrients

Internet platform microco.info
https://www.microco.info/

Frequently asked questions on food supplements
https://www.bfr.bund.de/en/release/frequently-asked-questions-on-food-supplements/

Update (2025): maximum levels proposed for iodine in foods, including food supplements
https://www.bfr.bund.de/en/opinions/update-2025-maximum-levels-proposed-for-iodine-in-foods-including-food-supplements/

Press Release: If using salt, use iodised salt
https://www.bfr.bund.de/en/press-release/if-using-salt-use-iodised-salt/

Science magazine BfR2GO
https://www.bfr.bund.de/en/publication/bfr2go-issue-12025-main-topic-food-supplements/

About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the German Federal Ministry of Agriculture, Food and Regional Identity (BMLEH). It protects people's health preventively in the fields of public health and veterinary public health. The BfR provides advice to the Federal Government as well as the Federal States ('Laender') on questions related to food, feed, chemical and product safety. The BfR conducts its own research on topics closely related to its assessment tasks.

The internet portal www.microco.info provides information on vitamins, minerals and numerous other substances that we ingest with food or that are offered as food supplements. In addition, the individual pages contain the maximum levels of vitamins and minerals in food supplements and in fortified foods as recommended by the German Federal Institute for Risk Assessment (BfR).

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