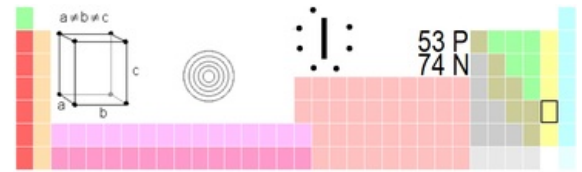


Iodine

Iodine is involved in hormone production in the thyroid gland.

Source

Sources of iodine are mainly marine fish and their products and iodised salt. In the Czech Republic, salt is iodised in the amount of 20-34 mg/kg of salt in the form of iodide or iodate. The iodine content of plant and animal foods depends on the iodine content of the soil and its supply to livestock. Milk and eggs tend to be good sources of iodine. Some iodine is lost through cooking.



Iodine in periodic table of elements

The recommended daily dose for adults is between **150** and **200 µg** (varies by country and age).^[1]

The iodine deficiency disease may also be caused by the **strumigens**, which are antinutritional substances. Strumigens can be divided according to their mode of action:

- **Strumigens of the first order** - prevent the attachment of iodine (thiocyanide, nitrates, polysulphides from cabbage).
- **Strumigens of the II order** - block peroxidases that convert iodine (radishes, onions, peas, tomatoes, spinach).
- **Strumigens of the III order** - block the formation of thyroxine (sulfonamides).
- **Strumigens of the IVth order** - competitively displace thyroxine, inhibit secretion TRH.

Iodine deficiency

Manifestations that can be prevented by sufficient iodine intake are referred to by the WHO as **iodine deficiency disorders** (Iodine deficiency disorders - IDD). This term was chosen to emphasize that the problem is far broader than mere **goiter** and **cretinism**, the classic and most visible symptoms of iodine deficiency. The spectrum of iodine deficiency disorders varies according to its severity and age. These include **milder mental impairment**, **delayed physical development**, **reduced fertility**, **increased stillbirths** and **perinatal mortality**.^[2]

The most critical period is from the 2nd trimester of pregnancy to the end of the 3rd year of life. Normal levels of thyroid hormones are required for brain development to occur in order for proper myelination of axons to occur. In iodine-deficient areas where thyroid hormone levels are low, brain development is impaired. The most severe impairment results in the development of cretinism, but at the population level, less severe degrees of impairment and reduced cognitive capacity are far more severe and affect the entire population. As a result, the mental abilities of "normal" children and adults living in iodine-deficient areas are lower than those in non-deficient areas - by as much as 13.5 points on the IQ scale.^[2]

Iodine deficiency disorders are among the most prevalent malnutrition disorders in the world.

 For more information see *nutrient deficiency diseases*.

Assessment of the iodine supply status of the population

Until the 1990s, the prevalence of goiter was used as the primary indicator of iodine deficiency in the population. Later, urinary iodine excretion, a sensitive indicator of recent iodine intake, became the method of choice for assessing and monitoring the iodine supply status of the population. If more detailed information is needed, TSH levels are obtained. Plasma TSH and thyroid hormone concentrations: TSH and plasma triiodothyronine (T3) typically increase in deficiency, while plasma thyroxine (T4) decreases. However, these changes may only become apparent in severe deficiency. The most commonly evaluated are school children, whose status usually reflects that of the general population.^[2]

Excess

Iodine excess-induced **goiter**, **thyrotoxic crisis** or **acne** have been described after exceeding the recommended iodine intake by several orders of magnitude. Even chronically high iodine intake, e.g. from iodine-containing drugs or disinfectants, can lead to the development of goiter.

The EU tolerable upper limit for long-term iodine intake for adults is 600 µg/day.^[3]

Links

Related articles

- Trace elements
- Iodine-uria

References

1. Deutsche Gesellschaft für Ernährung, Österreichische Gesellschaft für Ernährung, Schweizerische Gesellschaft für Ernährungsforschung, Schweizerische Vereinigung für Ernährung. . *Referenzwerte für die Nährstoffzufuhr (DACH)*. 1. edition. Umschau/Braus, 2000. 216 pp. ISBN 3-8295-7114-3.
2. ANDERSSON, M. *Iodine Deficiency in Europe: A continuing public health problem* [online] . 1. edition. 2007. 70 pp. Available from <http://www.who.int/nutrition/publications/micronutrients/iodine_deficiency/9789241593960/en/>. ISBN 978 92 4 159396 0.
3. Opinion of the Scientific Committee on Food on the Tolerable Upper Intake Level of Iodine. SCF/CS/NUT/UPPLEV/26 Final 7 October 2002 http://ec.europa.eu/food/fs/sc/scf/out146_en.pdf

Used literature

- BENCKO, Vladimír. *Hygiena – učební texty k seminářům a praktickým cvičením*. 2. edition. Univerzita Karlova, 2002. 204 pp. ISBN 80-7184-551-5.
- SCHNEIDERKA, Petr. *Kapitoly z klinické biochemie*. 2. edition. Karolinum, 2004. ISBN 80-246-0678-X.