GRASS Growing algae sustainably in the Baltic Sea

Macroalgae as food in the Baltic Sea region

Risks and food safety regulation

Macroalgae are a promising raw material for a wide range of consumables and food products in the Baltic Sea region. Diverse edible macroalgae species can be used as consumables taking into account food safety and regulatory limitations.

Heavy metals and contaminants

Macroalgae readily accumulate minerals from the surrounding water at their growth location. Unfortunately, macroalgae are also prone to accumulate toxins such as heavy metals including lead, arsenic, mercury and cadmium. This natural ability to accumulate toxins must be considered when macroalgae are harvested or cultivated in potentially polluted sea areas. At the moment, maximum limits for heavy metals have not been defined for macroalga food products specifically in the EU. As an exception, the maximum level for cadmium in food supplements consisting of seaweed or of products derived from seaweed is 3,0 mg/kg (weight as sold) ((EC) No 1881/2006).

Iodine

Macroalgae are a good source of iodine and a healthy alternative to iodized salt. However, especially brown macroalgae species may have very high iodine content that sets limitations to their use as food. Adequate intake for iodine set by the European Food Safety Authority (EFSA) is 150 µg/day for adults[1]. Moreover, tolerable upper intake level of 600 µg /day for adults has been recommended by EFSA and 1100 µg / day by the World Health Organization (WHO)[1,2]. With some brown macroalgae these limits may be exceeded already with very a small daily serving size. High consumption of brown macroalgae may impair thyroid health and thus the iodine content should be marked on the product labels. Variation in iodine content between and within species poses challenges for the food industry and product labelling. Iodine content can be reduced by food processing.

Food safety of novel macroalgae species

Food use of novel macroalgae species in the EU is regulated by the Novel Food regulation (Regulation (EU) 2015/2283). Status of different macroalgae species as novel foods may be consulted from the Novel Food Catalogue (https://ec.europa.eu/food/safety/novel_food/catalogue_en) and national food safety authorities. Novel Food regulation covers also the use of novel macroalgae species and macroalgae extracts as food supplements. If a macroalgae species or extract is considered a novel food, it needs to pass a safety assessment by EFSA and an authorization procedure to enter the EU market.

Key messages and recommendations

- Possible accumulation of heavy metals to macroalgae should be considered when choosing the cultivation or harvesting site to produce macroalgae for food purposes.
- Macroalgae producers and retailers should be aware of the levels of heavy metals in their macroalgae food products.
- Iodine content of macroalgae should be marked to the product labels and consumers should be alerted in case the iodine content is high.
- Novel macroalgae species and macroalgae extracts need authorization before they can be sold as food or food supplements in the EU.

Bladderwrack (*Fucus vesiculosus*)

Ulva sp. green algae

References

[1] EFSA Panel on Dietetic Products, Nutrition and Allergies. Scientific opinion on dietary reference values for iodine. EFSA J. 2014;12:3660.

[2] Joint Food and Agriculture Organization of the United Nations/World Health Organization Expert Committee on Food Additives. Evaluation of Certain Food Additives and Contaminants: Seventy-Third Report of the Joint FAO/WHO Expert Committee on Food Additives. Geneva: WHO Press; 2011. WHO Technical Report Series 960.

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