GRASS Growing algae sustainably in the Baltic Sea

Macroalgae as food in the Baltic Sea region

Health benefits and potential for food industry

Macroalgae are a rich source of nutrients and a versatile raw material for multiple food industry applications. Macroalgae cultivation offers a sustainable production platform that can be harnessed for production of nutritious food products, food additives and high-value bioactive compounds.

Nutritional content

Marine macroalgae have a superior content of essential mineral nutrients compared to land plants. Macroalgae contain calcium, potassium, magnesium, zinc, iron, manganese, copper and iodine. Moreover, macroalgae are a good source of both water-soluble and fat-soluble vitamins like vitamin C and vitamin A, respectively. In addition, macroalgae are a rare non-animal source of vitamin B12. Many green and red macroalgae species have high protein content and contain all essential amino acids for human nutrition. Macroalgae are also a rich source of soluble dietary fiber. Therefore, many edible macroalgae contain, for example, enough fiber or mineral nutrients like iodine for the use of nutrition claims “high fiber” or “high iodine”, in the product packaging. Permitted nutrition claims and the required levels of nutrients in foods are defined in regulation (EC) No 1924/2006.

Health benefits

Macroalgae contain a range of bioactive compounds including fibers, phenolic compounds and pigments. These compounds have documented health benefits like antioxidative and anti-inflammatory activities. Moreover, they modulate metabolism and promote healthy gut microbiota. However, more research is still needed on the bioavailability and activity of the different compounds. Currently, the EU regulation (EU) No 432/2012 of permitted health claims does not include any authorized health claims for macroalgae foods. However, the high content of mineral nutrients in macroalgae may justify the use of health claims related to individual nutrients like iodine.

Possibilities for the food industry

Most edible macroalgae can be used for food as fresh or dried and cooked. Globally, red and brown algae are important raw material for gelling and thickening agents carrageenan, agar and alginates. Moreover, macroalgae are a promising raw material for production of novel food additives like pigments or antioxidants. Macroalgae extracts may be used as food supplements or to fortify food products with nutrients or bioactive compounds. In addition, macroalgae are an intriguing possibility for sustainable production of protein for human consumption.

Key messages and recommendations

- Macroalgae are a rich source of mineral nutrients, vitamins, fiber and protein
- Macroalgae contain multiple bioactive compounds that are currently under active research
- Many macroalgae food products fulfill the nutritional requirements for the use of nutrition claims in the product packaging and for health claims related to individual nutrients
- Macroalgae may be used for extraction of multiple high-value compounds and fractions with applications in the food industry

Fucus vesiculosus

Flakes of green algae

Dietary supplements

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