Mattilsynet

Statens tilsyn for planter, fisk, dyr og næringsmidler

Risk management of food safety in seaweed

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The following will be covered

- NFSA work on seaweed
- Risk management of inorganic arsenic and iodine
- RASFF
- Ongoing work in EU
- Novel food
- Further work

Work on seaweed
at The Norwegian Food Safety Authority (NFSA)

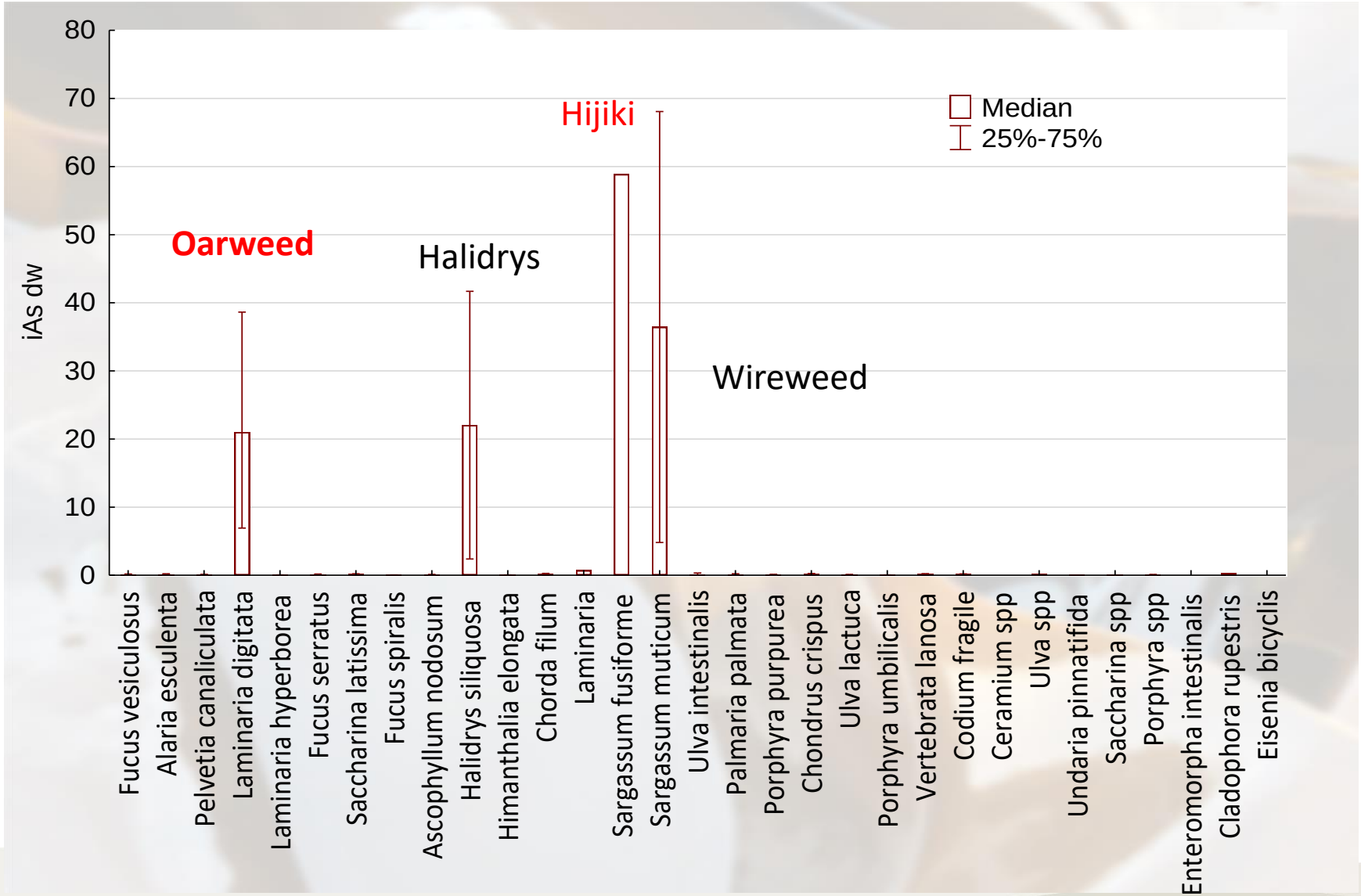
- **The Norwegian Government aims** to utilize more of the ocean's marine resources and facilitate both harvesting and farming of new species within a sustainable framework
- NFSA has been asked to contribute to facilitate this, with special focus on seaweed
- NFSA main focus in this work: **Food safety** (both food and feed)
- **There is little particular legislation on seaweed** - this makes it difficult for business operators to ensure the food safety - NFSA are therefore developing guidance on seaweed as use as food – both on a national and nordic level
- **Norway wants to reach a harmonised approach within the EU/EEA and has not established any national maximum levels or particular legislation for seaweed as use as food and feed**

The Institute of Marine Research (IMR) report 2020

- Published: 08.12.2020 on request by NFSA
- The report confirms previous conclusions in the report from IMR 2016 that **seaweed can have problematic high levels of metals and iodine**, and it may place restrictions on the use of seaweed as food and feed.
- In the new report, more data makes it possible to provide more reliable conclusions and **differentiation between species**. This gives us better knowledge of which species are best suited for production and sale, and which ones should be avoided to ensure food safety.

Inorganic arsenic - mg/kg dry weight (data from IMR-report 2020)

Oarweed (*Laminaria digitata*) compared with other species



NFSA risk management of high IAs in some seaweed species

IMR-data showed that oarweed (*Laminaria digitata*) may have a problematic high level of iA.

NFSA therefore warns consumers against eating oarweed https://www.matportalen.no/matvaregrupper/tema/diverse_retter_produkter_og_ingredienser/mattilsynet_advarer_mot_aa_spise_fingertare

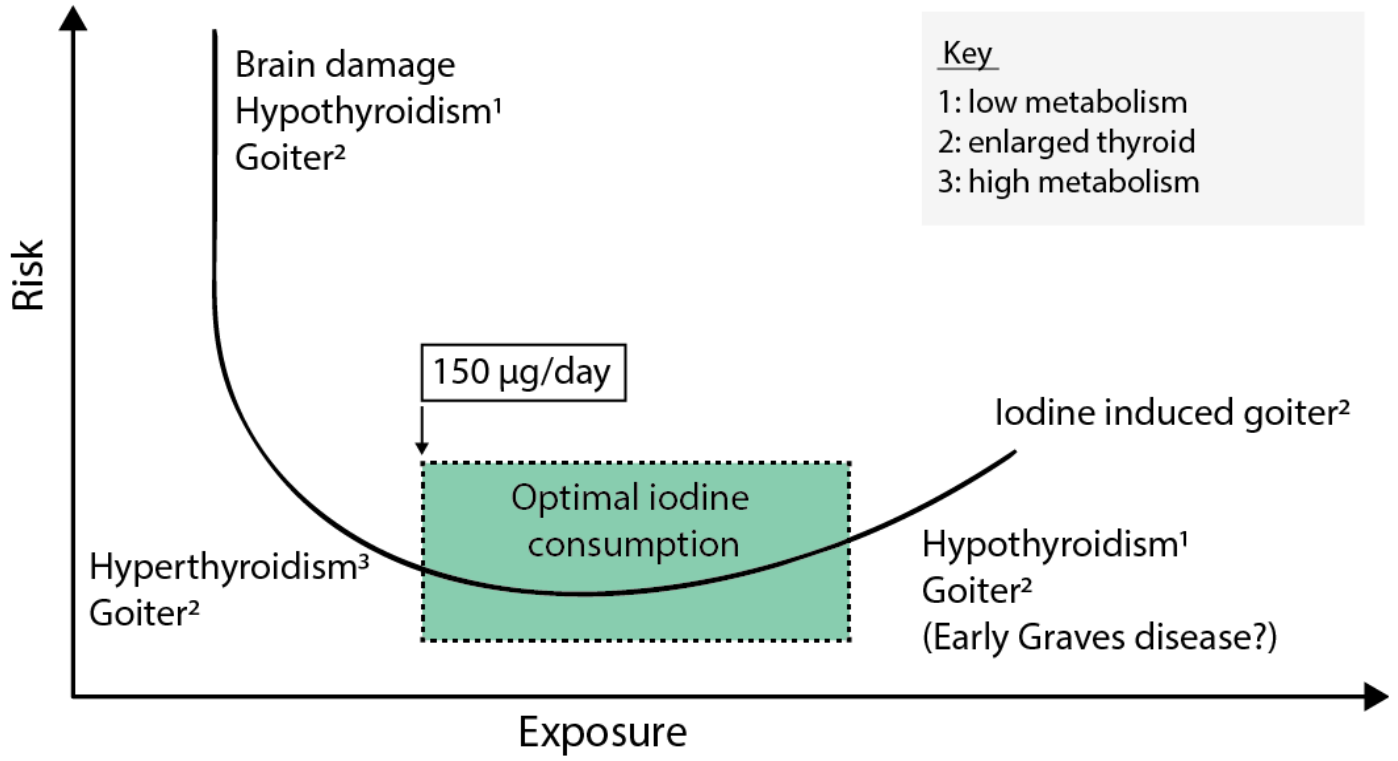
A similar warning is also given for the Asian species Hijiki for several years - both in Norway and many other countries

What about the very high iodine in some seaweed food products?

- At time perhaps the most problematic issue because of lack of knowledge and different risk management in different countries
- What are the solutions? NFSA has not concluded for further risk mangement strategy and we are also discussing this with other nordic countries
- NFSA must have science-based arguments for our management - like not forbidding sale of products with high iodine levels

Both too little and too much iodine is not good for the health

Reconstructed figure based on Laurberg (2009), via National Council for Nutrition's (2016)
Source of the illustration: Marthe Jordbrekk Blikra, Nofima



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Iodine

The IMR-report: **Bioavailability** of 73-78 % of iodine from sugar kelp was found in a rat model study

NFSA comment: This indicate that humans also have high uptake of iodine from seaweed and much is available during digestion. This is important knowledge for the risk management.

The IMR-report: The **iodine content can be reduced** by boiling, frying and drying

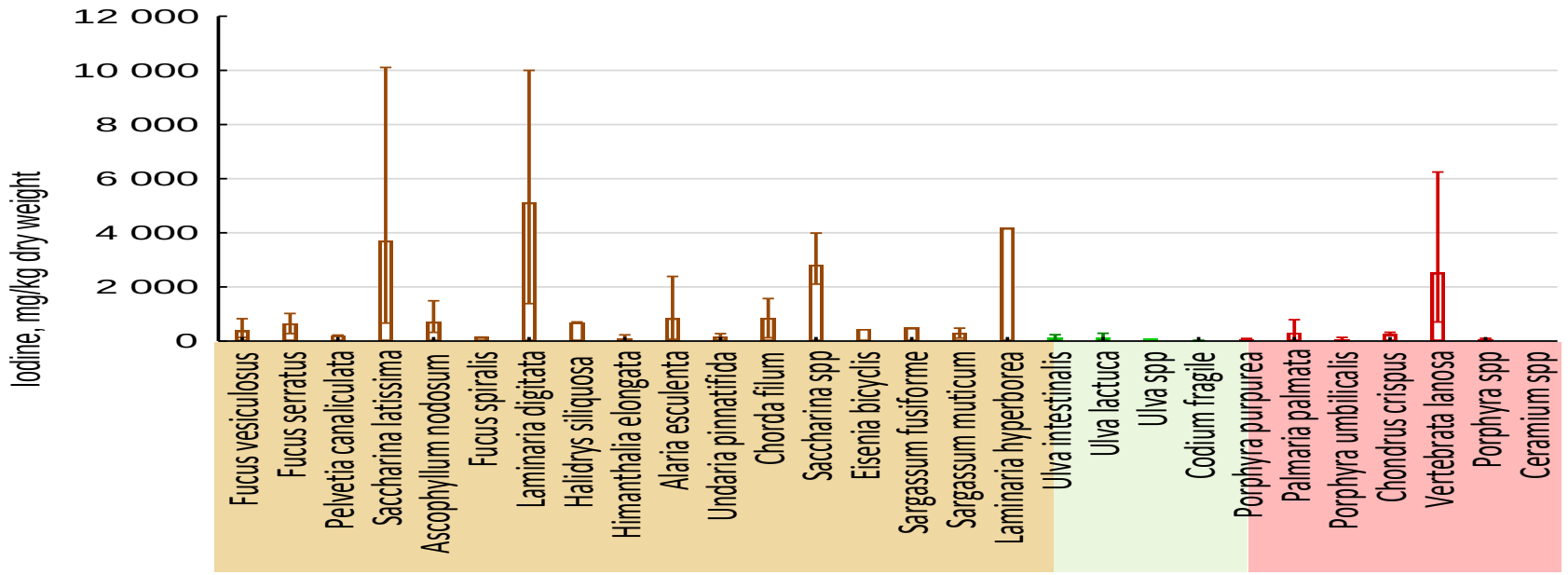
NFSA comment: This is primarily interesting for the business operators and may lead to products with a lower iodine content and less risk for both the consumers and market access. Methods for treatment of seaweed in preparation of food to reduce the iodine content in the finished dishes may also be relevant information for the business to communicate to the users (consumers, restaurants)

There are several other publications and ongoing research on iodine in seaweed and NFSA is observer i many projects to ensure focus on food safety

The iodine content in different species presented in the IMR-report – is too high for some European countries

Germany uses 20 mg/kg dw as maximum limit for iodine in seaweed. Only 5 out of the 402 samples were under this limit (that means almost all seaweed species, both from Asia and Europe)

France uses 2000 mg/kg dw as maximum limit in seaweed – which excludes most of the samples from sugar kelp (*Saccharina latissima*) - the seaweed species most used in aquaculture in Norway



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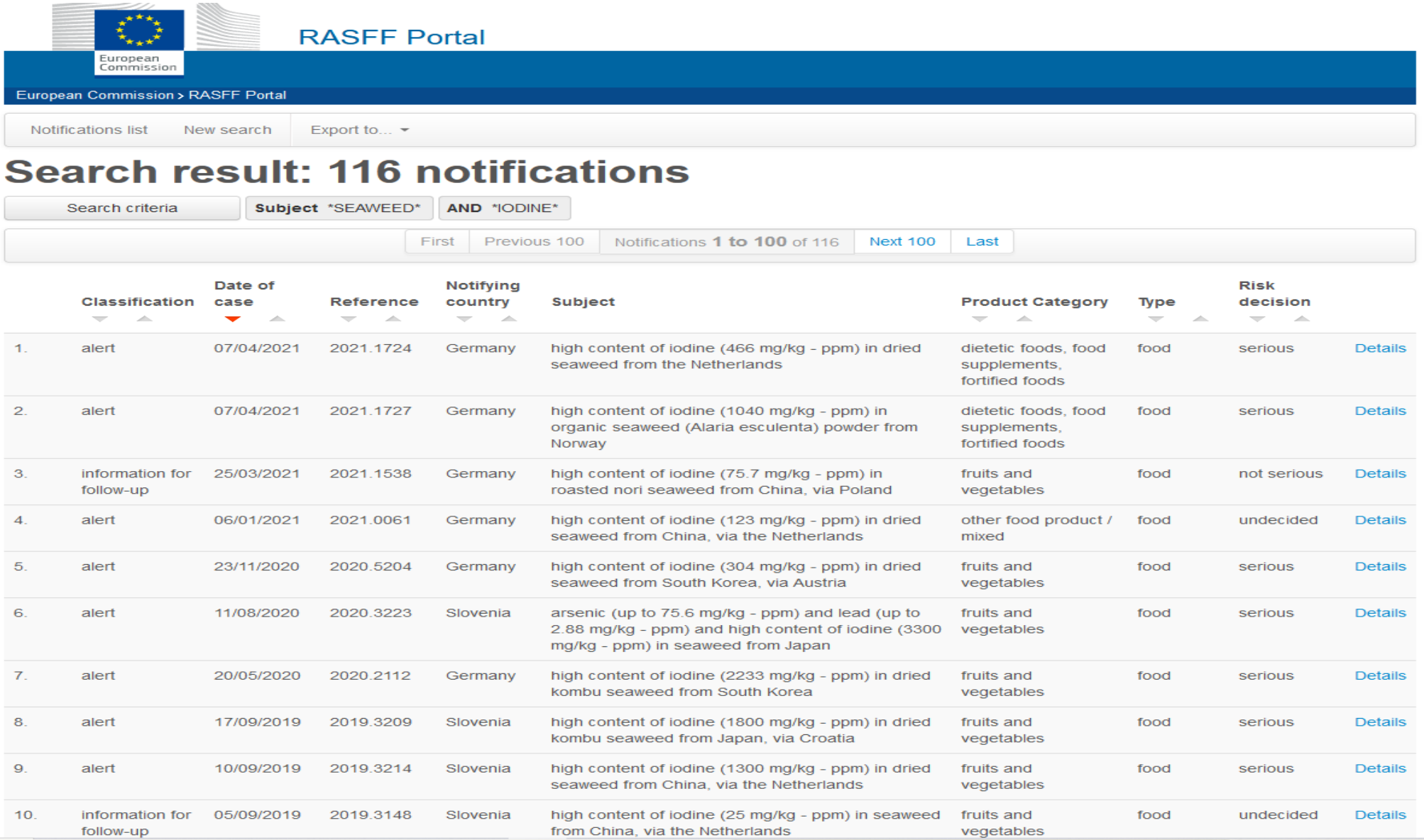
For seaweed products with no EU harmonised maximum limits for iodine and metals – different countries have different risk management

- RASFF – Rapid Alert System for Food and Feed
- RASFF is an important source for the status of risk mangement
- A European reporting system where information on unhealthy food and feed is exchanged in cooperation between the authorities of the member states of the EU, EFTA / EEA, Switzerland, as well as EFSA EFSA (European Food Safety Authority) and the EU Commission
- The European Commission collects and publishes notifications of any serious health risks deriving from food or feed and any measures taken, e.g. withdrawing or recalling food or feed from the market in order to protect consumers.
- RASFF Consumer Portal: https://webgate.ec.europa.eu/rasff-window/portal/?event=SearchForm&cleanSearch=1#

RASFF updated 11 April 2021: In total 172 alerts on *«seaweed»* and 116 alerts when search on *«seaweed» and «iodine»*



RASFF Portal

European Commission > RASFF Portal

Notifications list | New search | Export to...

Search result: 116 notifications

Search criteria | **Subject** *SEAWEED* | **AND** *IODINE*

First | Previous 100 | Notifications **1 to 100** of 116 | Next 100 | Last

	Classification	Date of case	Reference	Notifying country	Subject	Product Category	Type	Risk decision	
1.	alert	07/04/2021	2021.1724	Germany	high content of iodine (466 mg/kg - ppm) in dried seaweed from the Netherlands	dietetic foods, food supplements, fortified foods	food	serious	Details
2.	alert	07/04/2021	2021.1727	Germany	high content of iodine (1040 mg/kg - ppm) in organic seaweed (Alaria esculenta) powder from Norway	dietetic foods, food supplements, fortified foods	food	serious	Details
3.	information for follow-up	25/03/2021	2021.1538	Germany	high content of iodine (75.7 mg/kg - ppm) in roasted nori seaweed from China, via Poland	fruits and vegetables	food	not serious	Details
4.	alert	06/01/2021	2021.0061	Germany	high content of iodine (123 mg/kg - ppm) in dried seaweed from China, via the Netherlands	other food product / mixed	food	undecided	Details
5.	alert	23/11/2020	2020.5204	Germany	high content of iodine (304 mg/kg - ppm) in dried seaweed from South Korea, via Austria	fruits and vegetables	food	serious	Details
6.	alert	11/08/2020	2020.3223	Slovenia	arsenic (up to 75.6 mg/kg - ppm) and lead (up to 2.88 mg/kg - ppm) and high content of iodine (3300 mg/kg - ppm) in seaweed from Japan	fruits and vegetables	food	serious	Details
7.	alert	20/05/2020	2020.2112	Germany	high content of iodine (2233 mg/kg - ppm) in dried kombu seaweed from South Korea	fruits and vegetables	food	serious	Details
8.	alert	17/09/2019	2019.3209	Slovenia	high content of iodine (1800 mg/kg - ppm) in dried kombu seaweed from Japan, via Croatia	fruits and vegetables	food	serious	Details
9.	alert	10/09/2019	2019.3214	Slovenia	high content of iodine (1300 mg/kg - ppm) in dried seaweed from China, via the Netherlands	fruits and vegetables	food	serious	Details
10.	information for follow-up	05/09/2019	2019.3148	Slovenia	high content of iodine (25 mg/kg - ppm) in seaweed from China, via the Netherlands	fruits and vegetables	food	undecided	Details

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More results from RASFF

33.	alert	31/12/2015	2015.1665	Germany	cadmium (0.50 mg/kg - ppm) and high content of iodine (134 <--> 220 mg/kg - ppm fresh weigh) in dried seaweed from South Korea, manufactured in China, dispatched from the United Kingdom	fruits and vegetables	food	undecided	Details
34.	alert	11/06/2015	2015.0735	Germany	high content of iodine (2423 mg/kg - ppm) in dried seaweed from Japan	fruits and vegetables	food	serious	Details
35.	alert	23/03/2015	2015.0348	Germany	high content of iodine (33 mg/kg - ppm) in dried seaweed from China, via the Netherlands	fruits and vegetables	food	serious	Details
36.	alert	27/10/2014	2014.1445	Finland	high content of iodine (265; 3920 mg/kg - ppm) in dried organic seaweed from Spain	fruits and vegetables	food	serious	Details
37.	border rejection	09/10/2014	2014.BOQ	Finland	high content of iodine (3200 mg/kg - ppm) in dried seaweed from China	fruits and vegetables	food	serious	Details
38.	alert	25/06/2014	2014.0873	Germany	high content of iodine (276 mg/kg - ppm) in dried seaweed from South Korea	other food product / mixed	food	serious	Details
39.	alert	06/02/2014	2014.0172	Germany	high content of iodine (182; 237; 203 mg/kg - ppm) in dried seaweed from South Korea, via the Netherlands	fruits and vegetables	food	serious	Details
40.	information for attention	06/02/2014	2014.0170	Germany	high content of iodine (244; 131 mg/kg - ppm) in dried seaweed from South Korea	fruits and vegetables	food	serious	Details
41.	information for attention	05/02/2014	2014.0161	Germany	high content of iodine (197 mg/kg - ppm) in dried seaweed from South Korea	fruits and vegetables	food	serious	Details
42.	information for attention	05/02/2014	2014.0160	Germany	high content of iodine (211 mg/kg - ppm) in dried seaweed from South Korea	fruits and vegetables	food	serious	Details
43.	alert	04/02/2014	2014.0149	Germany	high content of iodine (171 mg/kg - ppm) in dried seaweed from South Korea	fruits and vegetables	food	serious	Details
44.	information for attention	04/02/2014	2014.0153	Germany	high content of iodine (156.9 mg/kg - ppm) in dried seaweed from South Korea	fruits and vegetables	food	serious	Details
45.	alert	04/02/2014	2014.0152	Germany	high content of iodine (4544 mg/kg - ppm) in dried seaweed from South Korea	fruits and vegetables	food	serious	Details
46.	alert	28/01/2014	2014.0123	Germany	high content of iodine (10.1 mg/kg - ppm) in canned seaweed in spicy marinade with raw material from China, via Latvia	fruits and vegetables	food	serious	Details
47.	alert	03/01/2014	2014.0011	Germany	high content of iodine (290.9 mg/kg - ppm) in dried seaweed from China, via the Netherlands	fruits and vegetables	food	serious	Details
48.	information for follow-up	18/09/2013	2013.1271	Germany	high content of iodine (47.7 µg/kg - ppb) in dried seaweed from China, via the Netherlands	fruits and vegetables	food	not serious	Details
49.	alert	07/08/2013	2013.1093	Germany	high content of iodine (3652 mg/kg - ppm) in dried seaweed from Vietnam	fruits and vegetables	food	serious	Details

NFSA risk management of high Iodine levels in seaweed used as food

- We have no national maximum limits for iodine in seaweed
- We give dietary advice to the consumers about high levels of iodine in some seaweed products and about intake in general and for vulnerable groups https://www.matportalen.no/uonskedestoffer_i_mat/tema/miljogifter/er_det_trygt_aa_spise_tang_og_tare
- We have an active dialogue with business operators and R&D about this topic and have information on our website:
  «What we know about the food safety of seaweed” https://www.mattilsynet.no/fisk_og_akvakultur/nye_marine_arter/tang_og_tare/hva_vi_vet_om_mattryggheten_for_tang_og_tare.34968

Information from NFSA to consumers

https://www.matportalen.no/uonskedestoffer_i_mat/tema/miljogifter/er_det_trygt_aa_spise_tang_og_tare

- Seaweed products **can contain thousands of times as much iodine as other foods**. Iodine is an element that has important functions in the body, but too much iodine can be harmful to health by affecting the function of the thyroid gland.

- **Adequate intake** of iodine is important for health, but intake of too much iodine, especially over a long period of time, is harmful.

- **Vulnerable groups** of the population must be especially careful with large intakes. This is especially true for pregnant, breastfeeding, young children and people who have diseases of the thyroid gland.

- In addition, **those with mild to moderate iodine deficiency** must be aware that the thyroid gland takes time to adjust. Sudden high iodine intake can therefore increase the incidence of thyroid disorders for this group.

- **Until we have more knowledge in place, we still recommend that people do not eat large amounts**

Problematic high IODINE in some products

What knowledge do we need and what are possible solutions?

- How much is the intake of seaweed among consumers? Very little data on this in Norway and Europe. Such data is important basis for risk assessments.

- Possible to do scenario calculations of what level of intake of seaweed is ok – but big difference within and between the species makes this a bit problematic

- Consumer habits - for example: Do many young vegetarian and vegan women eat much seaweed to try to get enough iodine? This may be possible - in particular if business have a marketing strategy saying the product is a good source for iodine, without any warnings that you can get too much. Some products also lack labelling with content of iodine – this makes it difficult to take an informed choice.

- EFSA will do an assessment on monitoring data on metals and iodine in products and solutions will be then be discussed in the EU

IODINE - some thoughts about solutions

<u>The business operator should think about:</u>

- Must have good knowledge about their products – good analyses of iodine when needed
- Not to market the products in a misleading way with non appropriate health claims
- Find good solutions as for example not selling products with high levels of iodine, in particular products it is diffult to measure what amount of seaweed you may eat - in order not to get too much according to the recommended daily intake of iodine (example one quarter of a «teaspoon» or 0,2 grams is difficult to measure for consumers)
- **Other important points?**

<u>Different solutions for risk mangement authorities and EU:</u>

- Establish national or EU maximum limit for iodine in seaweed – either in legislation or in recommendations and risk mangement
- Labelling requirements
- More specific information to consumers on our websites
- Putting more resources into monitoring of the market
- Not do very much (more) – leave the responsibility for solutions to ensure food safety to the business operators
- **Other solutions?**

The Commission Recommendation (EU) 2018/464 of 19 March 2018

One of the goals of this monitoring is to evaluate which action may be taken related to the exposure to iodine from these products

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018H0464&from=DE

From the preamble (5): " Seaweed and halophytes form an increasingly important contribution to the consumption patterns of certain EU consumers. Therefore it is necessary to assess whether the contribution of arsenic, cadmium, iodine, lead and mercury from seaweed and halophytes to the total exposure of these substances, would necessitate the establishment of MLs for arsenic, cadmium and lead for these commodities or the amendment of the MRL for mercury for algae and prokaryotic organisms or any action to be taken related to the exposure to iodine from these products."

Norway has communicated to EU that we are looking forward to further discussions in the EU about seaweed for the use in food and feed, to find a harmonized, science-based and reasonable way for risk management of both iodine and metals

Novel food status on seaweed species

- Current work in the Joint Research Center (EU) on a report collecting the information on authorized consumption of algae species in the Member States
- They are collecting data on all the species consumed before May 1997 as food or food supplements and mostly with the help of the national lists set up in each Member States
- The information will be integrated in the report in the form of a comprehensive table
- **NFSA has reason to believe that the following two commercial interesting species in Norway - will get the status "novel food" because of lack of evidence of consumption as food before 1997: *Laminaria hyperborea* and *Vertebrata lanosa***

NFSA further work on seaweed 2021 -

- Ongoing Nordic project with food safety regulators on risk mangement of seaweed used as food
- Ongoing work on new national guidelines for inspectors and business operators on seaweed used as food
- Discussions in a committee under the EU-Commission on iodine levels in feed from seaweed
- Presentation of our risk management of seaweed in EFSA's emerging risks exchange network (EREN)
- Upcoming discussion in a committee under the EU-commission on legislation and management on metals and iodine in seaweed as use in food and feed (late 2021, early 2022?)
- Continue the good dialogue with business operators and R&D

Norwegian Food Safety Authority is a partner in the nordic project:
A Nordic approach to food safety risk management of seaweed for use as food

- The project is supported by the Nordic Council of Ministers (2020-2022)
- Participants: Iceland, Norway, Denmark and the Faroe Islands (with Sweden in the reference group)

Project goals:

- Publish a report on risk management of food safety in seaweed with an included guidance to inspectors and food business operators
- Strengthen the networking and communication on seaweed between regulators in the Nordic countries

Main focus of the project is risk mangement of inorganic arsenic, heavy metals and iodine - but other aspects as hygiene and microbiology will also be included

Our websites (only in Norwegian)

For producers:

https://www.mattilsynet.no/fisk_og_akvakultur/nye_marine_arter/tang_og_tare

For consumers:

https://www.matportalen.no/uonskedestoffer_i_mat/tema/miljogifter/er_det_trygt_aa_spise_tang_og_tare

Thank you!

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