## CONTACT PERSON:

Livar Frøyland

livar.froyland@hi.no

+ 47 48185032

## NOTEWORTHY

The importance of fisheries and aquaculture is increasing both globally and in Norway, and in 2017 the total export value of seafood from Norway was close to 95 billion NOK. The Institute of Marine Research (IMR) documents seafood safety and gives advice on the potential for further sustainable growth and role of seafood in food security and nutrition.

seafood safety & health

# main Aim

Norway is among the largest exporters of seafood in the world; hence, we need to have an open and scientifically based documentation of nutritional quality and seafood safety issues for the global market. Moreover, the seafood safety and health program provides the scientific basis for the decisions made by national and international managing authorities for risk-benefit assessments, dietary recommendations and warnings related to seafood. The program will also document whether the marine resources, wild and farmed, are suitable for human consumption in the future.

# introduction/ program description

The Institute of Marine Research (IMR) is the main advisor to the Ministry of Trade, Industry and Fisheries, The Norwegian Food Safety Authority and other national and international authorities, industry and public sector related to seafood safety and health.

To achieve this our projects include: 1) monitoring of wild fish stocks addressing contaminants, parasites, other biohazards and nutrients 2) *in vitro* and *in vivo* models to document how the different nutrient and contaminant levels in seafood affect health 3) monitoring contaminants and medicinal residues in farmed fish, 4) impact of seafood consumption in relation to human health 5) the role of seafood in food security and nutrition.

In addition to the surveillance programmes from the Norwegian Food Safety Authority and other authorities, a significant part of this research is carried out on behalf of the Norwegian Research Council, The Norwegian Seafood Research Fund, EU and industry partners in cooperation with national and international research institutions.

# Impact

Advices from the Institute of Marine Research (IMR) related to seafood safety and health are summarised in annual reports based on scientific articles published in international peer review journals. The scientific articles, data sets and reports are the knowledge base for the managing authorities both nationally and internationally providing the scientific basis for risk-benefit assessments, dietary recommendations and warnings related to seafood. IMR produces a significant number of peer-reviewed publications, reports and popular scientific papers on seafood safety and health each year, including a number of PhD and master students for both national and international universities. The research provides the scientific basis for advice on seafood safety and health. Being the main advisor for seafood safety and health the institute has a significant impact in both science and on society.

# core activities

## Data/monitoring

Institute of Marine Research (IMR) has three main monitoring programmes on seafood. The first is on nutrients, environmental and emerging contaminants, parasites, and other biohazards from our main wild fish stocks on behalf of the Norwegian Food Safety Authority (NFSA). The second is related to the EU directive 96/23 which addresses illegal substances, pharmaceuticals and environmental contaminants in animals. NFSA is responsible for enforcing the regulation, planning and collection of the samples of farmed fish and IMR is responsible for analysing the samples and reporting the findings. The third is monitoring of Norwegian bivalve molluscs and mollusc locations for *E. Coli*, Salmonella and various environmental contaminants. In addition, IMR analyse nutrients and contaminants in a range of foods such as eggs and chicken products that are selected by the NFSA and the results are reported to the database the Norwegian Food Composition Table.

Any findings of illegal substances or levels of contaminants above legal limits are reported immediately to the NFSA. The main data are public available in a Seafood database where you can search for and compare the contents of contaminants and nutrients in fish and other seafood <https://sjomatdata.nifes.no/#search/>.

## Research

A wide range of relevant research projects increase the knowledge base for advice on aspects related to seafood safety and health. They cover identifying sources and potential transfer of contaminants to seafood, micro- and nanoplastics, bacteria resistant to antibiotics, mapping of fjords before disposal of mining waste, determine the nutrient status in selected Norwegian populations and how an intake of seafood affects nutrients status and health and how nutrients and contaminants interact and affect health outcomes in both animals and humans. In addition, how new marine resources can be used in a sustainable manner and the role of seafood in relation to food and nutrition security. To be ahead of possible new emerging contaminants in seafood, we are collaborating continuously with international and national researchers.

## Advice

Each year IMR gives advice on seafood safety and health through the reports to the various national and international authorities. Norway is one of the world largest exporters of fish and the reports and advice from IMR form the fundament for the seafood safety and health of Norwegian seafood to a global market. Based on the reports both national and international regulations and legislations may be affected, sometimes in disfavor and other times in favor of the seafood industry.

# future challenges

It is a political will in Norway for future sustainable fisheries and growth in aquaculture, as well as addressing the role of seafood in food security and nutrition. A 60 percent increase in the world food demand by 2050 has been estimated, and it is obvious that there is a strong need for increased food production based on sustainable food systems. Today, only 2-5 percent of our food supply comes from the ocean. Obviously, there is an immense potential for new marine food resources. The main challenge, in addition to the sustainability perspective, will be to verify the novel marine foods’ safety for human consumptions, as well as to understand the health aspects of novel foods for the consumer.