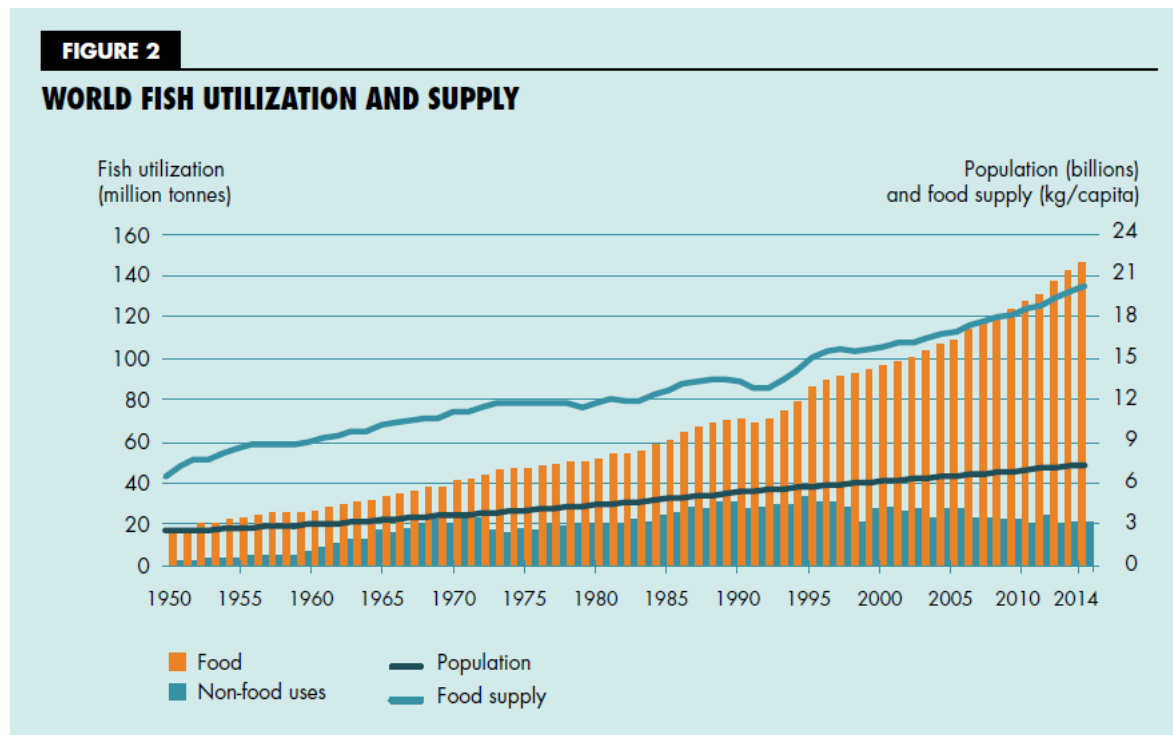


FAO. (2106) The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all. Rome. 200 pp.



FISH CONSUMPTION³⁶

The significant growth in fisheries and aquaculture production in the past 50 years, especially in the last two decades, has enhanced the world's capacity to consume diversified and nutritious food. A healthy diet has to include sufficient proteins containing all essential amino acids, essential fats (e.g. long-chain omega-3 fatty acids), vitamins and minerals. Being a rich source of these nutrients, fish can be nutritionally very important (see section Nutrition, p. 151). It is rich in various vitamins (D, A and B) as well as minerals (including calcium, iodine, zinc, iron and selenium), particularly if eaten whole. It is a source of easily digested, high-quality proteins containing all essential amino acids. While average per capita fish consumption may be low, even small quantities of fish can have a significant positive nutritional impact on plant-based diets, and this is the case in many LIFDCs and least-developed countries. In addition, fish is usually high in unsaturated fats, particularly long-chain omega-3 fatty acids. Fish provides health benefits in protection against cardiovascular diseases and assists in development of the brain and nervous system in the foetus and infants. Experts agree that the positive effects of high fish consumption largely outweigh the potential negative effects associated with contamination/safety risks.³⁷

FAO/WHO (2011). Report of the Joint FAO/WHO Expert Consultation on the Risks and Benefits of Fish Consumption. Rome, Food and Agriculture Organization of the United Nations; Geneva, World Health Organization, 50 pp.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- Consumption of fish provides energy, protein and a range of essential nutrients.
- Eating fish is part of the cultural traditions of many peoples. In some populations, fish is a major source of food and essential nutrients.
- Among the general adult population, consumption of fish, particularly fatty fish, lowers the risk of coronary heart disease mortality. There is an absence of probable or convincing evidence of coronary heart disease risks of methylmercury. Potential cancer risks of dioxins are well below established coronary heart disease benefits.
- Among women of childbearing age, pregnant women and nursing mothers, considering benefits of DHA versus risks of methylmercury, fish consumption lowers the risk of suboptimal neurodevelopment in their offspring compared with not eating fish in most circumstances evaluated.
- At levels of maternal dioxin exposure (from fish and other dietary sources) that do not exceed the PTMI, neurodevelopmental risk is negligible. At levels of maternal dioxin exposure (from fish and other dietary sources) that exceed the PTMI, neurodevelopmental risk may no longer be negligible.
- Among infants, young children and adolescents, evidence is insufficient to derive a quantitative framework of health risks and benefits. However, healthy dietary patterns that include fish consumption and are established early in life influence dietary habits and health during adult life.

5.2 Recommendations

To minimize risks in target populations, the Expert Consultation recommends that Member States should:

- acknowledge fish as an important food source of energy, protein and a range of essential nutrients and fish consumption as part of the cultural traditions of many peoples;
- emphasize the benefits of fish consumption on reducing coronary heart disease mortality (and the risks of mortality from coronary heart disease associated with not eating fish) for the general adult population;
- emphasize the net neurodevelopmental benefits to offspring of fish consumption by women of childbearing age, particularly pregnant women and nursing mothers, and the neurodevelopmental risks of not consuming fish to offspring of such women;
- develop, maintain and improve existing databases on specific nutrients and contaminants, particularly methylmercury and dioxins, in fish consumed in their region;
- develop and evaluate risk management and communication strategies that both minimize risks and maximize benefits from eating fish.

VKM (2014). Benefit-risk assessment of fish and fish products in the Norwegian diet – an update. Scientific Opinion of the Scientific Steering Committee. VKM Report 15 [293 pp], ISBN: 978-82-8259-159-1, Oslo, Norway.

From **a nutrient benefit assessment perspective**, VKM is of the opinion that for the different age groups, increase in both lean and fatty fish consumption will improve the role of fish as a source for important nutrients (EPA+DPA+DHA, vitamin D, iodine and selenium) relative to recommended intakes. Increased consumption of fatty fish will increase the intake of EPA+DPA+DHA and vitamin D, while an increase in the consumption of lean fish will increase the intake of iodine. Generally, an increase of marine fish consumption will increase the intake of selenium.

From **a benefit assessment perspective**, VKM is of the opinion that the average fish consumption in Norway for adults should give substantial benefit (positive health effects) with regard to specific cardiovascular disease. Pregnant women, who eat little or no fish, may miss the beneficial effects of fish consumption on neurodevelopmental outcomes in foetuses and infants.

From **a risk perspective** it is the opinion of VKM that with the present concentrations of dioxins and dl-PCBs, and mercury, the exposure to these compounds is below the tolerable intakes when fish is consumed in accordance with the dietary advice of 300-450 g fish (representing 2-3 dinner servings) hereof 200 g fatty fish per week and is therefore of no concern. This also applies if the fish consumed in adults consist of 1400 g farmed Atlantic salmon (representing 9 dinner servings) or 800 g mackerel weekly (representing 5 dinner servings). VKM is of the opinion that the present exposure to medicine residues including residues of antibiotics, new contaminants like the pesticide endosulfan, polycyclic aromatic hydrocarbons (PAH) and mycotoxins, and synthetic antioxidants (ethoxyquin (EQ), butylhydroksyanisol (BHA) and butylhydroksytoluen (BHT)) in farmed Atlantic salmon are of no concern.

Regarding the environmental contaminants brominated flame retardants, VKM refers to the conclusions in a risk assessment from EFSA in 2011 that the health risk associated with the current exposure to these compounds is low. The amount of fluorinated compounds such as PFOS and PFOA in the Norwegian diet is much lower than what is tolerable according to an EFSA assessment in 2008 (Chapter 2).

Following a comprehensive assessment of the scientific literature on the positive health effects of fish consumption and the contribution from fish to intake of beneficial compounds as well as exposure to hazardous contaminants in Norway, VKM concludes that the benefits clearly outweighs the negligible risk presented by current levels of contaminants and other known undesirable substances in fish. Furthermore, in Norway, adults including pregnant women with fish consumption less than one serving per week may miss the beneficial effects on cardiovascular diseases and optimal neurodevelopment in the foetuses and infants. In contrast to the conclusion in 2006, VKM concludes that there is no reason for specific dietary limitations on fatty fish consumption for pregnant women.