



Fish and Human Nutrition

MICRONUTRIENT DEFICIENCIES

More than two billion people are estimated to be deficient in essential vitamins and minerals, also called micronutrients. Preschool-aged children and pregnant women are particularly vulnerable, and have high prevalence of iron and vitamin A deficiencies.

Prevalence of iron deficiency anaemia and vitamin A deficiency

Regions	Prevalence of iron deficiency anaemia (%) (a)		Prevalence of vitamin A deficiency (%) (b)	
	Preschool-aged children	Pregnant women	Preschool-aged children	Pregnant women
Africa	64.6	55.8	41.6	14.3
Asia	47.7	41.6	33.5	18.4
Latin America / Caribbean	39.5	31.1	15.6	2.0
Oceania	28.0	30.4	12.6	1.4
Global	47.4	41.8	33.3	15.3

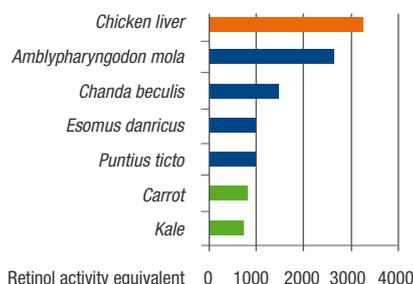
Sources: (a) WHO (2008), (b) WHO (2009)

Micronutrient deficiencies increase the risk of diseases such as diarrhoea, malaria and measles, leading to adverse consequences in growth and cognitive development of children, reproductive performance and work productivity. One of the direct causes of micronutrient deficiencies is inadequate diets which often lack sufficient amounts of micronutrient-rich foods such as fish, meat, fruits and vegetables.

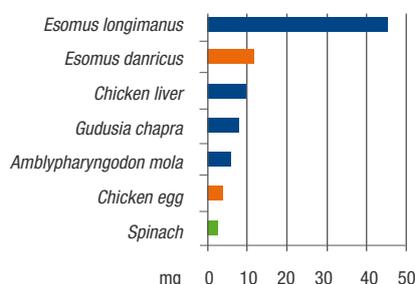
FISH AS A SOURCE OF MICRONUTRIENTS

In population groups living in riparian and coastal areas, fish is an integral part of the everyday carbohydrate-rich diet. Small fish, eaten whole, with head, organs and bones are particularly rich in calcium; some are also rich in vitamin A, iron and zinc, and these nutrients in fish are more effectively absorbed than those in plant-source foods. In addition, fish has an enhancing effect on the absorption of iron and zinc from the food in a meal. Small fish are more frequently consumed by the poor, and are likely to be distributed more evenly among household members than large fish or other animal-source foods. Small fish species can be used as a cost effective, food-based strategy to enhance micronutrient intakes in vulnerable populations, such as malnourished children, pregnant and lactating women, and people living with HIV/AIDS.

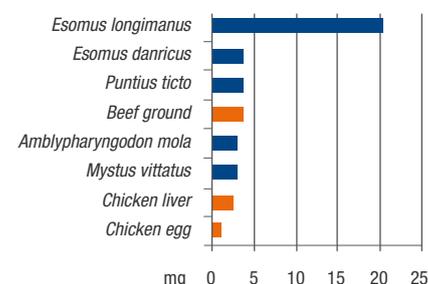
Vitamin A



Iron



Zinc



■ Small fish species from Bangladesh and Cambodia ■ Other animal-source foods ■ Plant-source foods

Micronutrient content of fish and other foods (per 100 g raw, edible parts)

Sources: Roos (2001), USDA (2005)

OPPORTUNITIES TO INCREASE PRODUCTION AND CONSUMPTION OF MICRONUTRIENT-RICH FISH FOR THE POOR

Studies in Bangladesh have shown that improved management of wetlands and seasonal floodplains can lead to an increased fish production, especially nutrient-rich small fish. This can provide income as well as fish for household consumption. Also, it has been shown that small fish can be incorporated in aquaculture with large fish and freshwater prawn in commercial as well as small, household ponds. Small fish do not hamper the production of large fish, and their inclusion increases total fish production, as well as the nutritional quality of the production. Promoting innovative fish production technologies in wetlands and ponds with nutrient-rich small fish species can increase consumption of micronutrients, especially in women and children. It is estimated that a small production of 10 kg/pond/year of the vitamin A rich small fish, mola (*Amblypharyngodon mola*), in the 4 million small, seasonal ponds in Bangladesh can meet the Vitamin A annual recommended intake of over 6 million children. A traditional Cambodian meal of rice and sour soup, made with 50 g of the commonly found, iron rich small fish, trey changwa plieng (*Esomus longimanus*) can meet 45% of the daily iron requirement of a woman.

ACTIONS NEEDED

To make full use of this potential of small fish species for improving micronutrient deficiencies, measures to develop and implement sustainable, low-cost technologies for management, conservation, production and accessibility of nutrient-rich small fish must be undertaken. More data on the consumption, nutrient analyses, cleaning, processing and cooking methods of small fish are needed. Advocacy, awareness and nutrition education on the role small fish can play in increasing diet diversity and micronutrient intakes must be strengthened. Evaluations of field-based interventions on the positive effect of meeting micronutrient requirements, especially in women and children, as well as analyses of the cost-effectiveness of micronutrient-rich small fish species in combating micronutrient deficiencies should be carried out.

Further information: WorldFish Center www.worldfishcenter.org and

WorldFish Working Paper http://www.worldfishcenter.org/resource_centre/WP_2106_Nutrition.pdf

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