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Editorial

The Role of Fish in Improving Nutrition and Health Outcomes

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EDITORIAL

Multiple challenges face the world in meeting the dietary and nutritional needs of a population that is expected to exceed nine billion people by 2050. While the main focus of attention for low- and middle-income countries remains undernutrition, including micronutrient deficiencies, and infectious diseases, problems of overnutrition and non-communicable diseases are rapidly increasing in prevalence and putting an increasing burden on health systems. To address this "double burden" of malnutrition, current food systems must change dramatically to increase production and consumption of foods that are known to improve human health, such as fruits and vegetables, nuts and seeds, whole grains, and seafood. Low consumption of each of these foods does, in fact, play a role in world death and disability.

Fish and other aquatic animal products are a vital component of many people's meals around the world. According to food balance sheet data, at least one billion people rely on fish as their primary source of animal protein, and three billion people rely on fish for at least a fifth of their animal protein intake, albeit these statistics are highly unclear. Dried fish is a particularly significant diet for rural inland poor populations in Asia and Africa; such fish are generally tiny and swallowed whole. As a result, they have higher concentrations of minerals including calcium, zinc, iron, and vitamin A than larger fish. Vitamin B12, which is only found naturally in animal source foods and plays a crucial role in brain and nervous system function is also found in fish. In addition, fish contains a component known as the "meat factor," which aids in the absorption of micronutrients from other foods. While the micronutrient profile of many fish species addresses many of the same gaps that are limiting in the rural poor's cereal-based diets, the public health community recognises fish primarily for its high level of omega-3 fatty acids, such as EPA and DHA. Low consumption of these nutrients is thought to be responsible for a quarter of all disability-adjusted life years lost (DALYs) owing to ischemic heart disease and 1% of all worldwide DALYs. According to recent studies, 80% of the world's population consumes less than 250 mg per day, with extremely low levels (less than 100 mg per day) widespread in Sub-Saharan Africa, South America, and Asian mainland countries.

Whilst it can be argued that increasing supplies of a nutrient rich product – fish – is in itself a nutrition-sensitive action, there are further positive measures that can be taken to secure improved nutritional outcomes from aquaculture. While expanding supply of a nutrient-dense product – fish – might be considered a nutrition-sensitive action in and of itself, there are other steps that can be taken to ensure better nutritional outcomes from aquaculture. Some key areas of attention for research include:

(1) The creation of aquaculture farming systems that boost the quantity and availability of nutritious fish to low-income people. One example is the introduction of micronutrient-rich fish into homestead pond polyculture systems in Bangladesh for home consumption and sale, but more research is needed across the developing world to improve nutritional outcomes from aquaculture, such as through optimisation of fish species combinations, pond management, and harvesting systems.

(2) Increasing the nutritional content of fish through the development of feeding systems. While considerable study has been done on improving omega-3 fatty acids in Atlantic salmon through feed ingredients and fish feeding systems, there has been relatively little work done on developing nation aquaculture species including tilapia, carps, and catfishes. Manipulation of fish diets, feeding and fertilisation systems, and the use of locally available feed and fertilisers, where possible, is an area of research with a lot of potential for boosting the nutritional value of fish.

(3) Using fish as a source of sustenance during the first 1,000 days of life. Fish consumption during pregnancy is connected with a lower risk of preterm delivery and greater performance on numerous measures of brain development in children, according to evidence primarily from industrialised countries. Fish can help fulfil the significant micronutrient needs of children aged 6–12 months, who are growing rapidly yet have limited stomach capacity, because it is a rich source of numerous micronutrients, including zinc and iron. Animal-source items are routinely omitted from the diets of young children and women, according to research from several settings in Africa and Asia. Behaviour change communication and food processing technologies can help overcome the barriers that prevent certain subpopulations from reaping the benefits of fish.

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(4) Improved fish preservation and food safety to provide wider access to the needy. Fish is thought to be extremely susceptible to waste and food safety issues because it is a perishable item. However, there is little solid evidence on the scope of such issues or the burden they impose on human health. There is a critical need to gather evidence and implement thoughtful solutions that decrease waste from both fisheries and aquaculture, improve fish safety, and keep fish cheap for low-income populations.