



Dietary Benefits of Seafood and Marine Products

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DESCRIPTION

Aquatic foods, which include fish, shellfish, crustaceans, and algae, have long been an essential component of human diets. Their significance extends beyond providing basic nutrition, as these foods contribute to multiple aspects of human health, including cardiovascular function, brain development, immune support, and metabolic regulation. Increasing scientific attention has been given to understanding the diverse nutrients and bioactive compounds present in aquatic foods and their roles in maintaining physiological homeostasis and supporting overall welfare.

The contribution of aquatic foods to brain development and is particularly significant. Docosahexaenoic (DHA) is a structural component of neuronal membranes, influencing membrane fluidity, neurotransmission, and signal transduction. Adequate DHA intake during early life stages supports visual acuity, cognitive performance, and neural development. In adults, omega-3 fatty acids from fish and other aquatic sources have been associated with maintenance of cognitive function and may reduce the risk of age-related neurodegenerative conditions. In addition, trace elements such as iodine and selenium play supportive roles in neurodevelopment and thyroid hormone regulation, highlighting the multifaceted contributions of aquatic foods to neurological health.

The environmental and dietary context of aquatic food consumption is also relevant to human welfare. Coastal and inland communities often depend on fisheries and aquaculture for food security, economic livelihoods, and cultural practices. Access to nutrient-rich aquatic foods supports not only physical health but also social and economic well-being. Sustainable aquaculture practices can maintain production without compromising environmental quality, ensuring that communities continue to benefit from aquatic foods over the long term.

Processing and preparation of aquatic foods influence their nutritional value and health effects. Fresh, minimally processed fish and shellfish retain the highest concentrations of omega-3

fatty acids and vitamins. Cooking methods such as steaming, poaching, and baking preserve nutrient content while avoiding the introduction of harmful compounds. Excessive frying or prolonged exposure to high temperatures can reduce omega-3 content and promote the formation of oxidation products. Proper handling, storage, and preparation therefore enhance the positive contributions of aquatic foods to human health.

Dietary recommendations increasingly emphasize the inclusion of aquatic foods for balanced nutrition. International health organizations suggest regular fish consumption, particularly fatty fish, to meet requirements for essential fatty acids. Shellfish are recommended to complement other protein sources and provide necessary micronutrients. Integrating diverse aquatic foods into weekly meal plans can help achieve optimal nutrient intake, support growth and development, and reduce the risk of nutrient deficiencies in vulnerable populations.

Aquatic foods also play a role in supporting gut health and microbiome diversity. Certain polysaccharides, peptides, and bioactive lipids act as substrates for beneficial gut microorganisms, promoting a healthy microbial community. This contributes to improved digestion, nutrient absorption, and immune modulation. By influencing gut microbial composition, aquatic foods can indirectly affect systemic health outcomes, including inflammation, metabolic function, and neuroendocrine signaling. The interplay between aquatic foods and the gut microbiome represents an additional pathway through which these foods enhance human welfare.

Public health research has explored the role of aquatic foods in preventing non-communicable diseases. Epidemiological studies demonstrate associations between regular fish consumption and lower incidence of cardiovascular disease, cognitive decline, and certain metabolic disorders. Shellfish intake contributes to meeting micronutrient requirements that are otherwise challenging to obtain from terrestrial sources. Incorporating aquatic foods into national dietary guidelines reflects recognition of their value in maintaining population health and reducing the burden of diet-related diseases.

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Education and awareness are important for maximizing the benefits of aquatic foods. Knowledge of species, nutrient content, and safe consumption practices empowers individuals to make informed dietary choices. Understanding seasonal availability, sustainable sourcing, and preparation methods ensures that aquatic foods contribute effectively to nutrition without compromising safety or environmental integrity. Nutrition programs that include aquatic foods can address deficiencies, support maternal and child health, and enhance overall quality of life.

In conclusion, aquatic foods offer a wide range of benefits for human health, nutrition, and overall welfare. They provide high-

quality proteins, essential fatty acids, vitamins, minerals, and bioactive compounds that support cardiovascular function, cognitive development, immune competence, metabolic regulation, and gut health. Beyond individual nutrition, aquatic foods contribute to food security, economic stability, and cultural practices, reflecting their broader importance in society. Sustainable production, informed consumption, and integration into dietary strategies ensure that aquatic foods continue to enhance human welfare and support population health globally. By combining nutritional value, ecological considerations, and socio-economic benefits, aquatic foods represent a vital component of comprehensive approaches to human well-being.