

Harnessing Local and Traditional Foods for Nutrition, Health and Functional Food Development: Insight from Global and Indonesian Biodiversity

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Food and nutrition are inextricably linked and have critical roles in human health throughout the lifespan. By preventing malnutrition, diseases brought on by malnutrition, and optimizing the functions of the body, nutrition plays a critical role in preserving life and maintaining the balance of the human body's metabolism^{1,2}.

Amerta Nutrition focuses on food formulation and food modifications for health and nutrition, so in this volume 9 (2) June 2025 edition, we address the role of food and its nutritional content in preventing nutritional problems, metabolic diseases, and certain diseases that require specialized diets. Local foods can also be used as an alternate source of food and nourishment in emergency situations, such as disaster relief³.

Local and traditional foods serve an essential function in preventing malnutrition and chronic disease. Wider exploration of local biodiversity can improve dietary diversity while also maintaining food security⁴. Using locally grown foods that are high in micronutrients, easy to grow, low maintenance, and easily accessible from the environment can help prevent micronutrient deficiencies⁵.

In order to improve food security and alternative source of nutrition, Sub-Saharan Africa has started to make more use of underutilized and neglected local species. Examples of these include the use of breadfruit and walnuts in Nigeria, as well as sesame and snow peas in Uganda⁶.

The Asian continent, a place with a high biodiversity, has become a pioneer in the use of food, not only to meet daily dietary needs, but also to prevent diseases due to the presence of natural bioactive chemicals. Food for Specific Health Uses (FOSHU) was first proposed in Japan in 1991 as a regulatory framework to authorize health claims on food labels and to conduct scientific assessments of their efficacy and safety⁷. Essential fatty acids, antioxidants, carotenoids, minerals, vitamins, and bioactive peptides are among the bioactive substances found in functional food that can help prevent disease and promote health^{8,9}.

Indonesia is one of the Southeast Asian countries with a high natural potential for alternative dietary

components and health benefits. Indonesia's diversified geographical location, along with its proximity to water, results in a wide range of indigenous cuisine that may have health benefits. This potential is developed using marine resources such as microalgae, animal shells, and marine animals high in protein, antioxidant chemicals, and other bioactive compounds¹⁰⁻¹³. The fruit of mangrove plants on the coast also has potential due to the presence of antioxidants¹⁴. Additionally, a lot of people use nuts as an alternate protein¹⁵. Tubers, breadfruit, and cereals are also being studied for their potential use as sources of carbohydrates and dietary fiber with prebiotic characteristics¹⁶⁻¹⁹.

Leaves and flowers' bioactive component have also been investigated and shown to have disease-prevention properties²⁰⁻²². Fruit skins and rare fruits contain bioactive compounds that can serve as antioxidants^{23,24}. Various Indonesian molds and bacteria contribute to the production of beneficial substances in regional food, such as tempeh and *Dadih*, respectively^{19,25,26}. Food technology has advanced rapidly in an endeavor to generate this native cuisine. Functional foods can be manufactured using a variety of technologies, including extraction, fermentation, enrichment, biotechnology, and nanotechnology^{8,27}.

The next issue for developing more functional local food, particularly in Indonesia, is the consistency in the quality of raw materials from all regions, as environmental and seasonal constraints necessitate standardization of the quality of local food raw materials. Variations in the amount of bioactive material that can affect the organoleptic of the final product must be determined with careful composition so that it is comfortable for consumers while not compromising health benefits. Likewise, using appropriate food processing technology can help to preserve the nutritional value of food products. The paucity of local food production, caused by a lack of studies and mass manufacturing of local food products, as well as a lack of planting area, makes the local food supply insecure^{28,29}.

The bright side is that public health awareness is on the rise, which has become a significant driving force in the development of functional foods, nowadays. This

has resulted in an increased demand for foods that provide specific health benefits in addition to basic nutritional value³⁰. The usage of industrial by-products has also helped to advance the development of these foods³¹. Research into providing vegetarians with a variety of protein sources derived from nuts and grains is one area that could be expanded^{32,33}. However, research into the potential nutritional content and bioactive chemicals in local foods, their role in reducing malnutrition and disease, and the safety considerations of local food items requires further improvement and is still in early stages of development.

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