



# CURRENT ISSUES OF FOOD IN INDONESIA

## Editors:

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Winiati P. Rahayu

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Giyatmi

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INDONESIAN ASSOCIATION OF FOOD TECHNOLOGISTS  
2020

CURRENT  
ISSUES  
OF FOOD  
IN INDONESIA

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## PREFACE

Thank you and sincere gratitude to the almighty God because after a long process, finally, the book entitled **Current Issues of Food in Indonesia** can be published. This is IAFIT's first book in English which contains a collection of ideas from members in Indonesia. They come with the same goal of reviewing the current condition of food in Indonesia, its problems, and alternative solutions.

A total of 33 authors have contributed their articles to this book with a total number of 35 articles. The contribution of the writers' ideas is very useful for information about the status of food in Indonesia to the wider community. Publishing English-language books are the target of IAFIT, considering that this professional organization needs to expose the idea, thinking, and concept of its members globally. This book contains five parts, namely Food Security and Safety, New Technology, Functional Foods, Ingredients, and Nutrition, and the last part is about the Specific Issues. Some of these articles have been published in previous IAFIT's book entitled "Pangan Indonesia Berkualitas, 2018 which was written in Bahasa Indonesia.

Special thanks go to the President of IAFIT for the support to the editorial team from the beginning until the publication of this book. High appreciation also goes to all the authors who contributed to this book. To the reviewer and editor team who have worked hard to do their job, thank you so much. Our high appreciation and thanks also go to Mr. Ryan Salfarino, STP,

M.Si, who has provided technical assistance in the editing and lay-outing process and Dr. Februadi Bastian, who designed the cover of this book. Likewise, Darmawan, S.TP, Nandita Irsa Ulul Nurhisna, S.TP, and Wibisono Adhi, S.TP who assisted in finalizing the editing process, and in completing the articles. Finally, to all parties who played a role from the beginning until the publication of this book, many thanks to all of you. We realize that there is still a shortage in this book so that it is expected many inputs from various parties to make it better in the future. We sincerely hope that this book will be of great benefit to readers who are both in Indonesia and abroad.

Wassalamualaikum warahmatullahi wabarakatuh.  
Peace to all of us.

Makassar, August 2020  
Editor in Chief

Meta Mahendradatta

## PREFACE FROM PRESIDENT OF IAFT

One of the programs of the **Indonesian Association of Food Technologists** (IAFT/ *PATPI*) is providing its members with the opportunity to publish their idea, knowledge, thought, or concepts on food research and development by writing articles in a popularly scientific version. This book entitled **Current Food Issues in Indonesia** is a collection of essays written by members of IAFT coming from around Indonesia. Different from the previous books published by PATPI that written in the Indonesian language, the present book was written in English so that this book can be understood and beneficial to the readers from FIFSTA and other countries in the world. The articles are divided into five categories or aspects, *i.e.*, policy in food security and safety, technology, functional food, ingredients and nutrition, and specific or emerging issues. We do hope that this book may be useful as a reference in preparing policy related the food development, especially in Indonesia, and may give inspiration for further research and development related to food science and technology.

May I take this opportunity to highly appreciate to Prof. Dr. Meta Mahendradatta – the Chief editor, and all editors Prof. Dr. Winiati P. Rahayu, Prof. Dr. Giyatmi, Dr. Ardiansyah, Dr. Dwi Larasatie Nur Fibri, Dr. Feri Kusnandar, and Prof. Dr. Yuli Witono for their hard work to do editing the manuscripts and to prepare



this book. My appreciation also goes to Ryan Salfarino, STP, M.Si, who did the layout process and all who has given a contribution to publish this book.

Finally, may this book find you - the reader useful.

Yogyakarta, August 2020  
IAFT President,

Prof. Dr. Umar Santoso

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## (IV-2)

# UTILIZATION OF FISH AND MORINGA LEAVES IN STUNTING PREVENTION

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Indonesia is currently still facing the problem of stunting in children under five years old. Basic Health Research (*Riskesdas*) reveals that the prevalence of stunting for children under five years old is 30.8%, which is higher than the target of RPJMN (National Midterm Development Plan) 2015-2019, i.e., 28%. Stunting is a condition of children under five years old with a height that does not match their age. Stunting is classified into chronic nutrition problems due to many factors such as socioeconomic conditions, nutrition of pregnant women, bearing the disease, and lack of nutrition in infants. Children under five years old suffering stunting will have problems in achieving optimal physical and cognitive development.

One of the main causes of stunting in children under five years old is malnutrition in the first 1000 days of life, starting from the fetus in the womb until two years old. The effects of chronic malnutrition can be permanent and difficult to improve on the growth of children under five years old and have long-term effects for the next three generations (Achadi, 2014). One of the efforts to prevent stunting is the fulfillment of nutrition during

pregnancy and lactation as well as providing supplementary foods for breastfeeding (*MP-ASI*) children of 6-24 months old.

Fish and moringa leaves have the potential to use as processed foods that can meet the requirement of optimal macro and micronutrients in the period of the first 1000 days of life for mothers and children so that the processed foods can be an alternative offered for stunting prevention. Proximate composition of fish is 50-85% water, 15-25% protein, 1-20% lipid, and 0.6-1.5% mineral (Irianto and Giyatmi, 2009). The Ministry of Health of the Republic of Indonesia has recommended moringa leaves as supplementary foods for breastfeeding because moringa leaves contain potassium equivalent to 3 pieces of bananas, calcium equivalent to 4 cups of milk, vitamin C equivalent to 7 pieces of oranges, and vitamin A equivalent to 4 pieces of carrots. Moringa leaves are also potentially superior as a lactagogum that is good to be consumed by nursing mothers (Widowati et al., 2019).

## **Stunting**

Stunting is brought about by long-term malnutrition so that it affects the quality of human resources. Therefore, overcoming malnutrition is a profitable long-term investment through specific targeted interventions, especially for women and toddlers. One of the causes of malnutrition is the inadequate consumption of food because of an infection or improper parenting during pregnancy. These factors often affect each other. The infection results in loss of appetite, while the need for nutrients increases and crucial to fighting the infection. Inadequate consumption also makes the body vulnerable to infection due to decreased immunity. Malnutrition also affects the body's physiological functions, including hormonal functions.

## **First 1000 days of life (1000 HPK)**

The golden period of growth and development occurs in the first 1000 days of life beginning when the fetus is conceived until the baby is two years old. Malnutrition during pregnancy



has a big influence on the growth and development of children. Malnutrition occurring at that period will lead to initial disorder to the physical development, brain development, intelligence, learning ability, and productivity that are difficult to repair. Therefore, the period of pregnancy until the two years old baby is a window of opportunity, namely a short period to do something useful in this case to improve nutritional status. Malnutrition in the fetus or 0-2 years infant can inhibit the further growth and development of the next period. Babies will grow into children with under standard height and/or stunted intelligence, and these growth disorders can be irreversible (Achadi, 2014).

## **Fish**

The advantage of fish as an energy source is that the fish has a protein structure being more easily digested by the body compared to proteins from terrestrial animals. Protein has a function as a building material and supports the growth of body cells. Protein quality is assessed by comparing the amino acids contained in the protein. The digestibility value of fish protein is very high, so that it is suitable for protein sources of all age groups, from infants to the elderly. Therefore, the high protein content makes fish suitable for use as food for malnutrition sufferers.

In addition, fish also contain omega-3 fatty acids that are needed by human. Fish are rich in EPA and DHA that can reduce the risk of atherosclerosis and coronary heart disease and have anti-inflammatory effects. Omega-3 fatty acids, particularly EPA and DHA are essential for the proper development of the fetus, and the use as supplements during pregnancy is associated with decreased immune responses in infants, including a reduction in the incidence of allergies in infants (Widowati *et al.*, 2019). DHA is a key component of all cell membranes and is found abundantly in the brain and retina. EPA and DHA are also precursors of several metabolites being lipid mediators, which are considered by many researchers to be useful in the prevention or treatment of several diseases. For the use of fish oil as a fortification ingredient,

microencapsulation techniques can be applied which effectively mask the unpleasant flavor of fish oil and protect against oxidative damage of fatty acids as well as avoid the generation of undesirable odors by minimizing contact with oxygen, preventing contact with metal ions, preventing direct exposure to light, and trapping unwanted flavor.

Fish is a significant source of vitamin D. Deficiency of Vitamin D can cause rickets, osteomalacia, low bone mineral density, and osteoporosis. The vitamin D content of fish varies between 0.5 and 30  $\mu\text{g}$  / 100 g of fish meat. The biological availability (bioavailability) of selenium and selenite in fish is very high. Fish and fish bones are good sources of calcium and the absorption level of which is comparable to skim milk. Calcium plays an important role in bone density, and calcium salt can provide rigidity to the skeleton, and calcium ions play a role in many metabolic processes. The average calcium content in crustaceans, mollusks, and fish, is 68 to 26 mg / 100 g. In addition, fish and other marine products are good sources of phosphorus with an average content of between 204 and 230 mg / 100 g.

## **Moringa leaves**

*Moringa oleifera* leaves are one of the plants that are widely used as medicinal and herbal plants *Moringa oleifera* is a fast-growing plant and very tolerant of extreme climates. Its uses as an alternative food substitute are relatively still limited. The nutritional content of moringa leaves is quite high, so it is very important as a functional food is beneficial to health and to overcome nutritional deficiencies.

Moringa is not only rich in nutrients, but also has functional properties which are beneficial to human health. Both the nutritional content and various active substances contained in moringa plants can be used for the benefit of living things and the environment. Protein, fat, carbohydrates, minerals, vitamins, and amino acids are secondary metabolites found in moringa leaves act as alternative sources in the case of malnutrition.

In some regions in Indonesia, especially eastern Indonesia, moringa is usually consumed as a vegetable. In the Philippines, moringa leaves are very well known to be consumed as a vegetable and can function to increase the amount of breast milk (breast milk) in nursing mothers. It is not surprising that moringa got the nickname Mother's Best Friend. This is because moringa leaves contain micronutrients that are needed by pregnant women, such as beta carotene, thiamine (B1), riboflavin (B2), niacin (B3), calcium, iron, phosphorus, magnesium, zinc, vitamin C. Moringa can be used as an alternative to improve the nutritional status of pregnant women.

### **Processed food products based on fish and moringa leaves**

Fish based food products may vary in the form of side dishes for staple foods, or processed foods for snacks. Meanwhile, moringa leaves have been widely used in alternative foods such as cookies, baby food, soup, bread, yogurt, and others.

To prevent stunting, developing processed food products with raw materials of combined fish and moringa leaves can be employed. In addition to the balance of nutritional values, product development must also consider the acceptance by prospective consumers, namely pregnant, breastfeeding, and children up to two years old. Psychologically pregnant women and nursing mothers generally do not like products having the fishy taste or smell originating from fish. The unpleasant taste of Moringa leaves will also be considered in developing products for these consumer groups.

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