Academy of Food and Nutrition
Indonesian Academy of Sciences
(AIPG – AIPI)

Policy Brief

Improving the Global Competitiveness of Indonesian Food Products

Indonesian Academy of Food and Nutrition – Indonesian Academy of Sciences
(AIPG - AIPI)

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Executive Summary

- The food sector is a strategic sector and contributes significantly to the national economy. Food sector has the potential to be the major force in improving the nation's competitiveness. Strengthening this sector needs to be put in the priority with the aims of (i) improving national food security and nutrition (FS&N), especially addressing the problem of stunting, wasting and obesity, (ii) improving food product competitiveness, and (iii) improving sustainability. This effort should be designed based on technology and innovation and to be upstream and downstream-integrated (from production to consumption). Therefore, it is essential to map food and nutrition research agenda along with human resource development plan, policy and regulatory requirements. Food and nutrition research for productivity improvement, import substitution, promotion/increase of exports, as well as the creation of typical future food based on social and environmental innovations need to be prioritized.
- Improving the competitiveness of food products in both local and global trade should be done by ensuring food safety and quality, applying the 3B principles: best value, best brand, and best network, and exploring the distinctive uniqueness of Indonesia, from Aceh to Papua. The global food trade, as an essential part of the food system for FS&N of Indonesia, needs to be managed prudently and supported by appropriate policies, in accordance to domestic conditions and potentials. Trade diplomacy plays a pivotal role in the competitiveness of national products.
- Development of regulations required to ensure continuous efforts to strengthen the food sector needs to be carried out using the principles of good regulatory practices, through (i) identification of existing related regulations, along with its respective implementation directives; (ii) analysis of relevance and its relative merits; (iii) developing mechanism to ensure effective involvement of all stakeholders. The food sector needs to be developed, managed in a disciplined and consistent manner by implementing relevance regulation based on science, evidence and data-driven (research) to improve safety and quality, the welfare of food producers (fishermen, farmers, planters, MSMEs, and other food workers) and other local communities, while always considering the aspects of sustainability.
- Higher quality of human resources are fundamental to explore, manage and develop highly competitive local food resources, through programs such as (i) education to all actors along the food chain, (ii) education to encourage entrepreneurship, and (iii) education on the essential link between food and health.

Context and Issues

Increasing the competitiveness of national food products in global trade faces multi-dimensional challenges. The first and toughest challenge is the global economic crisis that has lasted since the beginning of 2020 due to the COVID-19 pandemic and is likely to continue for several years to come. The second challenge is a classic challenge in the national economy. Economic development in one orchestration that connects the entire economic actors integrally must cover the entire commodity supply chain. The third challenge is to ensure the continuity of products and quality that meet sustainable food standards.

The domestic food sector produce food products to meet the needs of diverse, nutritious, balanced, and safe food for each individual to be able to sustainably live a healthy, active, and productive life (Law No. 18, 2012). The food sector (food crops, horticulture, livestock, plantations, fisheries, and marine) has been proven to be able to survive in any situation including economic and monetary crises, also proven during the COVID-19 pandemic. The agricultural sector in a broad sense (including food crops, horticulture, plantations, livestock, marine, and fisheries, etc.) surprisingly showed a positive growth of 1.75% in 2020, which is higher than the macroeconomic growth of minus 2.07% with a share of 13.70%. Agricultural sector exports increased significantly during the COVID-19 pandemic.

Some essential food commodities such as soybeans, corn, meat, milk, sugar, and salt are still highly dependent on imports. Meanwhile, various leading commodities such as coffee, cocoa, tea, spices, fishery products, seaweed, and palm oil, despite being able to compete in global trade, still face challenges related to the issues of sustainability, safety, quality, and traceability. This export commodity helps to reduce the total trade balance deficit.

Compared to the target of achieving each individual's goal to be able to sustainably live a healthy, active, and productive life, the condition of the food sector is still disturbing. This is evidenced by the problem of stunting in toddlers, vitamin A deficiency in children, iron deficiency (anemia) of young women and pregnant women, as well as increasing rates of obesity. This condition indicates that in addition to the still needed efforts to increase food production, it is also highly necessary to make efforts to improve the safety, nutrition, and quality of Indonesian food.

The challenge of increasing food production needs to be well-addressed, taking into account the principles of sustainability appropriately, so as not to adversely affect the environment. Food production activities starting from the farm to processing by industry and its distribution not only must it pay attention to aspects of safety, nutrition, and food quality, but must also pay attention to aspects of greenhouse gas emissions, availability of clean water, and energy consumption. In addition, the lengthy system of food production and distribution chains that have not been supported by adequate infrastructure and inefficient supply chain management has resulted in high food loss and food waste. This condition not only adds to the burden for the environment but also decreases the efficiency of the production process, increases transportation costs, decreases quality, which ultimately decreases the competitiveness of food products.

In addition to the improvement of production and transportation systems, product competitiveness is also strongly influenced by the capabilities of creating innovation from players in the food sector. In 2019, the World Economic Forum's Global Competitiveness Index 4.0 reported that Indonesia was ranked 50th out of 141 countries. One of the 12 elements with the lowest score is innovation capability (ranked 74th out of 141 countries) measured by these parameters; the number of patent applications per one million inhabitants (0.07), R&D spending expressed in percent GDP (0.1%), and trademark applications per one million inhabitants (185). The IMD World Competitiveness Ranking 2020 reported ranking of Indonesia was 40th out of 63 countries. This represents a decrease compared to 2019 (ranked 32nd). The low and debilitating level of innovation has a direct impact on the competitiveness of Indonesian food commodities in the global market as well as domestically.

The food sector has a great contribution to the national economy and has the potential to be the force to improve the competitiveness of the nation. It has been proven that this sector is not only able to survive but also grow and absorb a very large number of labor and at the same time provide income that

can improve the welfare of the workers involved. However, the livelihood conditions of the actors along the food industry supply chain, especially most of the farmers, planters, ranchers, fishermen, and small traders are still fragile. Therefore, it is necessary to have a strong commitment to build a solid, shocks, and stress-resistant food sector, including stress caused by the COVID-19 pandemic.

This commitment needs to be secured by appropriate regulations and policies, to establish a more sustainable food and nutrition system. This food system needs to be developed based on innovation and technology, to be able to contribute effectively to FS&N, to achieve Sustainable Development Goals (SDGs), by ensuring that no one (especially farmers, planters, farmers, fishermen, and small traders) are left behind. Therefore, it is essential to always pay attention and consider the socio-economic and institutional aspects, supported by strengthening the appropriate aspects of education and Human resources.

Recommendations

Regulation and Policy

The shift of the food sector development approach from natural resource-based to technology and innovation-based needs to be guarded by regulations and policies to encourage the management of competitiveness and trade (international) which is more suitable with the conditions and superiority of Indonesia's national food system.

The fact that there are quite a lot of cases of rejection in the global market shows that the competitiveness of Indonesian food products is still low, especially aspects of food safety and quality. Therefore, efforts need to be made to boost the competitiveness of these products, including the development of regulations [including standard production guidelines, and code of practice] to ensure the safety and quality of products. The regulations must consider the real conditions of Indonesia and therefore need to be developed based on science, evidence, and data of research results on the condition of Indonesian food production systems.

The competitiveness of food products is influenced by the condition and competitiveness of the domestic food system. Therefore, to boost the power of products in the international environment, Indonesia needs to strengthen the food system (from production to consumption) in a disciplined and consistent implementation of science-based regulations, evidence, and data (research) to improve safety and quality, and also at the same time to improve the welfare of farmers (fishermen, farmers, planters, micro, small and medium enterprises (MSMEs) and other workers) and other local communities. Regulations that further encourage the utilization of biotechnology, which is still not optimized, need to also be developed.

The development of science-based regulation (evidence and research data) directed accordingly with the conditions of the Indonesian food system, can also avoid the emergence of potential "over-regulation" which is counter-productive. Therefore, the process of regulatory development (especially about safety, nutrition, and food quality) needs to be done through:(i) identification of related regulations, along with the implementation directives; (ii) analysis of its relative merits; (iii) forming design by effectively involving all stakeholders, the process of which refers to good regulatory practices. Some fundamental regulatory objectives identified are to improve the competitiveness of food producers, improve sustainability, improve nutritional status and public health, develop uniqueness/ local excellence (geographical indications), empower MSMEs, as well as encourage the growth of start-ups and marketing innovations.

The policy of accelerating food production can be based on four strategies, namely: (i) on the supply side, there must be a continuous effort to increase production to ensure food availability; (ii) on the delivery side, it must ensure distribution connectivity that guarantees food affordability for all levels of society; (iii) in food processing, industries must comply with standards of food production and processing which will not only maintain the quality standards but also protect the environment; (iv) the ultimate goal of the implementation of these standards is the achievement of food safety for the end food consumer.

Evidence and research data are also indispensable for diplomacy in the making of international regulations that are more inclined to our interest. In addition, evidence and research data are also needed for lobbying/product promotion

purposes as well as to advocate the acceptance of national regulations, standards, and certification systems in international forums (Codex, IPPC, OIE, WTO), to ensure compliance with the Rome Declaration (2014), as well as in adhering to the global commitment to achieve SDGs. With the basis of evidence and data, the compatibility of regulations and policies at the global and national levels can be achieved.

To support the development of evidence and data-based regulation, it is necessary to develop a supporting research program. For example, through a competitive grant scheme in the field of research whose output is directed to support the design of more appropriate regulations, suitable with the conditions of food safety, nutrition (health), sustainability, economy, social and environmental, to improve Indonesia's competitiveness.

Furthermore, the implementation of this regulation needs to be translated into simple, practical, and easy-to-understand terms by businesses and in local terms to facilitate understanding. Therefore, it is necessary to develop a massive development, empowerment, and counseling scheme, for all actors of food systems along the food chain, such as "BIMAS BARU" with the target of Food MSMEs (Figure 1).

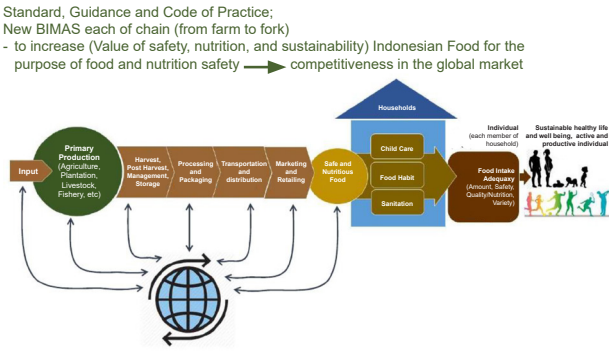

Figure 1. Food system actors along the food chain, from production to consumption

This empowerment needs to also be equipped with basic infrastructure improvements (transportation, water, electricity, internet, information, and others). Empowerment and counseling programs need to be developed with an upstream-downstream approach, from production to consumption, in an integrated manner with the awareness that the strength and competitiveness of the system as a whole are precisely determined by "the weakest link". Efforts to increase competitiveness, need also be supported by various policies and other programs, especially encouraging the development of a new generation of entrepreneurs / international food businesses, among others by providing facilities to become exporters, doing business in other countries, opening Indonesian restaurants abroad, special funding schemes, innovation competitions, investment exchanges, and others. These efforts can be included in educational and training programs to build the desire and courage of international business and not only comfortable with the large domestic market. This policy can be done through national policies harmonized to provinces, cities, and villages. In addition, there has to be synergy between the Ministry of Technology, Ministry of Education, and CSR of large corporations with a shared objective to alleviate the issue of competitiveness.

Thus, it is necessary to compile a map of food and nutrition research and encourage the creation of innovation to (i) solve the national FS&N problem, especially the problems of stunting, anemia, and obesity (triple burden), (ii) increase power competitiveness of products, and (iii) improving sustainability. The map of food system development needs, including the development of research, must be complemented with the human resources development map and the necessary policy and regulatory needs map.

Technology and Innovation

In general, science should be used as a basis for innovation in the development of the food sector. The direction of technology development and innovation needs to be carefully designed and oriented towards upstream-downstream integration, productivity improvement (including reduction of food losses and food waste, the use of modern technologies such as biotechnology, nanotechnology), increased production for import substitution, promotion/increase in exports (especially for superior products: palm oil, coffee, cocoa), the creation of future food(exploration of sources and future food potential), including social innovation and environmental innovation.

It is necessary to develop a road map of upstream-downstream food research (research activities and down streaming research results)

to produce innovations in improving the quantity and quality of food. Research and down streaming of the results needs to be developed in a more collaborative ecosystem of research and innovation, involving governments-industries-academics- and-communities to support the transformation towards FS&N. This upstream research roadmap must also include international trade.

Food trade is an important part of the food system towards FS&N Indonesia, also in the supply chain system and the food and nutrition value chain. Therefore, it is no longer relevant to distinguish between global and domestic markets because food markets are 'total markets' (including local, regional, and global markets) that interact with each other to form interconnected systems (Figure 2).

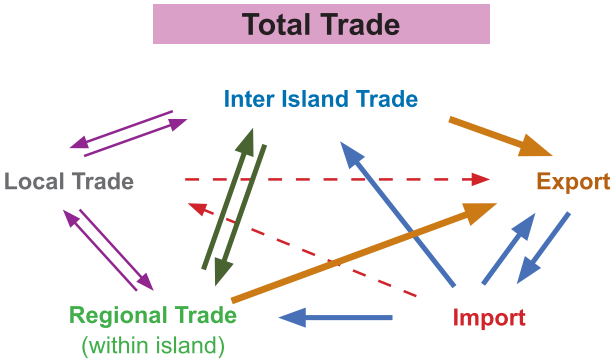

Figure 2. Food trade is a total trade

As with export-import, the amount of international trade in Indonesian food products needs to be managed prudently, taking into account the end goal, which is to strengthen FS&N. It is parallel with the "Rome Declaration on Nutrition (2014) which states that "trade is a key element in achieving food security and nutrition, and trade policies are to be conducive to fostering food security and nutrition for all, through a fair and market-oriented world trade system, and reaffirm the need to refrain from unilateral measures not following international law, including the Charter of the United Nations, and which endanger food security and nutrition, as stated in the 1996 Rome Declaration". Therefore, nationally there needs to be a proper policy on international trade. The focus and oversized portion of export-import can be at risk of global market uncertainty and fluctuations, whereas if it is too small, Indonesia may lose the opportunity to benefit from global competition, not engaged in world activities.

This upstream-downstream roadmap of food research to encourage technological development and innovation along the food supply chain needs to conform to the real needs of seed breeders, farmers, traders, processed food companies, retailers, and exporters of food products (Figure 3).

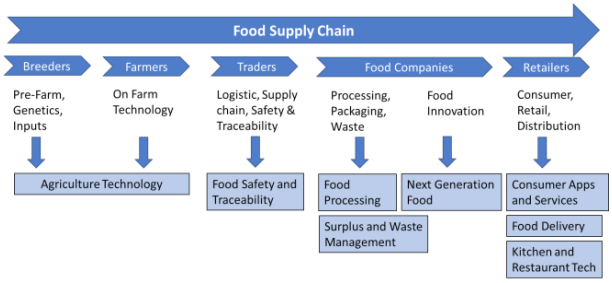

Figure 3. Technology and innovation across the food supply chain

Some forms of technology and innovation to overcome problems that hinder the improvement of food product competitiveness are exemplified below.

Agricultural technology. The use of agricultural technology aims to improve agricultural efficiency, reduce food loss, be sustainable, to utilize biotechnology to produce superior seeds/seeds which is pests and diseases -resistant. Also, the use of sensors in the land/garden, drones, agricultural management software, automated machines on-farm, water management, and intelligent fertilizer. This category also includes new agricultural techniques such as vertical farming, bioreactor farming, cultivation as well as insect breeding.

Traceability and food safety. Traceability and food safety require technological solutions for sanitizing machinery and food processing equipment, measuring the freshness of products, and extending the shelf life of food. This category also includes products or services for detecting unwanted foodstuffs, pathogens, and allergens, as well as blockchain applications that help trace along the supply chain and display product origin.

Food processing. Food processing is a product or service that utilizes innovative techniques to process food or improve the benefits of food ingredients, for example, 3D printing specifically designed for food, encapsulation technology for certain materials, or industrial-scale robots.

Food waste management. Management of food waste requires innovation in the form of products and product handling that can help reduce food waste. For example, an application that can redistribute excess food from restaurants and supermarkets, utilizing food waste to produce non-food products. This category also includes sustainable packaging solutions such as alternatives to plastics or other polymers made from biomaterials.

The Next Generation of Food and Drink. The next generation of food and drink can be produced by the use of scientific knowledge and technology that is energy, water, and an efficient land, as well as low in greenhouse gas emissions. This category includes, among others, cell-based meats, alternative proteins such as plant-based meats (meat analog), insect-based products, mushroom-based, functional food, and beverage as well as new food ingredients.

Consumer applications and services. Consumer applications and services facilitate access to food and information in it, for example, the nutrition and cooking recipes applications, an e-commerce platform, an application that helps consumers get food products, food producers, or certain food outlets to meet increasingly diverse needs, desires and services that make it possible to hire professional home cooks.

Food delivery. This category includes grocery deliveries, ready-to-eat food deliveries from restaurants, or virtual kitchens, and specialty food and beverage deliveries from local producers, all of which can be done quickly and cheaply using smart devices.

The research roadmap to improve FS&N needs to be equipped with appropriate policy, regulation, and human resource development, to enable the proper running of the program. Policies that associate domestic production improvement programs with imports (e.g. policies that require wheat importers to produce cassava, or sago) need to also be reviewed.

Concerning the objectives of FS&N, the focus on strengthening the food system needs to be directed at (i) increasing the role of local resources, (ii) improving aspects of sustainability, and (iii) improving the status and condition of nutrition and public health.

Socio-Economic and Institution

The competitiveness of Indonesian food products is an important issue, not only in the context of the global market (export-import) but also in the context of Indonesia's domestic market, which has a much larger economic value than the foreign food trade. Especially with the condition of the COVID-19 pandemic, due to global economic recession and economic recovery that takes time to heal, the competitiveness of food products should be highly prioritized. Although food export is one of the strategies to bring in foreign currencies that are important for the national macro-economy, food exports must be managed within safe limits to ensure national food security. Food export market share is regulated in the range of 22-30% of total national production. Most national food products must still be allocated to meet domestic needs.

Improving the competitiveness of food products is part of efforts to boost the national economy, downstream integration, both with the corporatization of farmers and food estates; financing support to MSMEs; management of natural resources (social forestry), and job creation. Institutional empowerment of food production is carried out through a partnership strategy between businesses currently running in the PIR scheme (Plasma Farming, foster parent, or contract farming). Formal credit institutions are encouraged to continue to provide low-interest micro-business credit, especially for micro, small and medium-sized food businesses. In this case, the strengthening of MSMEs has become an important focus in the national food production and trade system.

Food trade governance will determine the status of food security. Food supply chain systems should be developed within the framework of SDGs, which must be supported by entrepreneurial development. In the development of the food supply chain, the regional areas (secondary city) should be a reference, not just a big city (megapolitan). The region has a diversity of production and consumption potential, with ecoregions that must be supported by the commitment of the Local Government. The food system needs to pay attention to the shifting proportion of the city's population in the future. The proportion of the population living in urban areas will reach 60% by 2025. That is, the concentration of

food fulfillment in the future is in urban areas. With the strengthening of food consumption in urban areas, the food trade system should be an important part of the national food system.

Improving the competitiveness of food products in local and global markets can adopt the principle of 3B: best value, best brand, and best network (Figure 4). In terms of marketing strategy, this can be achieved by promoting more unique, more quality, and affordable products. Indonesia has the opportunity to increase competitiveness through the development of storytelling and strong flavors, which can be found in various regions from Aceh to Papua.

Food policy is not a commodity policy, but it should be an integral part of the national food system. There has to be a change of perspective from a commodity or production approach to a whole diet. The viewpoint of food policy should be directed more to the consumption approach. Indonesia has the opportunity to lead consumption patterns, so it does not have to copy from other countries.

In the context of SDGs, there is responsible production and responsible consumption. The implementation of this consumption pattern policy can be accelerated by the establishment of ministry-level food institutions (Law 18/2012).

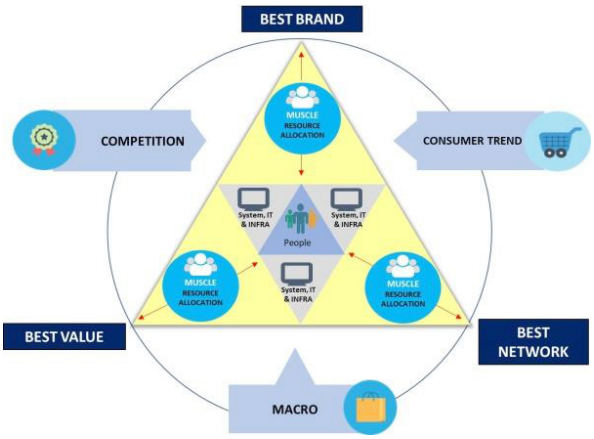

Figure 4. Improving the competitiveness of food products in local and global markets can adopt the principles of 3B: best value, best brand, and best network

Integration of the national food product market must begin and continuously encourage food businesses both large and small and medium scale to comply with food sustainability certification standards of various types. The fulfillment of food standards is an important part of the national food system policy. Safety standard policy in national food governance is an integral part of national food institutional development, especially aspects of national food quality assurance.

Education and Manpower

Aspects of education and manpower are important aspects, whose development must be adapted to the needs of food system development, including the development of research and necessary policies and regulations. Dependable human resources must be equipped with life skills in their fields. Life skills are the ability and courage in facing the problems and challenges of the development of the design and food industry in the future. Must-have skills are in the mastery aspects of knowledge, skills, success skills in holding ethical values, and professionalism. Some examples of life skills implementation in the world of work (industry) include the ability to communicate verbally and in writing, adapt to new environments, and the ability to process information, critical thinking /analytical in making decisions and solving problems.

Upon entering the era of IR 4.0, the preparation of human resources must have 4C capabilities namely critical thinking, creativity, communications, and collaboration. Opportunities and challenges in the era of IR 4.0 should be anticipated in the educational process to produce graduates who have high competitiveness in the world of work. Therefore, it is necessary to develop formal and informal education and training for the improvement of human resources in the field of agricultural technology, food processing, processing and utilization of waste (zero waste), and the field of food safety.

To be able to draw up a map of education development and appropriate manpower, it is necessary to review the current human resources conditions, identify the necessary needs, gaps that occur, as well as the necessary efforts to close the gap. Particularly for the development of the food sector that supports sustainable FS&N, education and adequate human resources are needed to be able to explore, manage and develop highly competitive local food resources.

Various educational programs that need to be implemented include:

Education of actors in the food sector. In this context, it needs to start from family education, for example educating families about the consumption of nutritious food. The focus of this family education must be directed to all segments, ranging from on-farm level actors to marketing. At the farmer level for example, in addition to knowledge about the consumption of nutritious food, it is also necessary for them to have the ability to produce products with quality that meets the required standards. Likewise, fishermen, planters, and small businesses. Therefore, mentoring and counseling become important. Note: for example, Indonesian palm oil products are rejected in the EU market, among others, because of cultivation processes that are considered problematic or do not meet the criteria. Education for actors in the food sector needs to be managed and implemented in collaboration with various professions, including social media experts to develop effective educational media. In this case, it is recommended that the counseling system needs to be revived to guide the farmers.

Entrepreneurship. Education (especially vocational education), besides paying attention to human resources with mid-level skills, is also necessary to be directed to produce graduates who are self-sustained. In this context, it is necessary to develop human resources who are ready to strive, even facing global trade. Human resources understanding of local food and at the same time global markets (e.g. consumer behavior) need to be improved. Some skills that need to be developed are:(i) understanding local wisdom (related to food and natural resource management), (ii) the development of local food products, and (iii) laboratory and monitoring to ensure the safety and quality of food.

In this case, it is necessary to collaborate well between universities and industry, to innovatively develop an experience-based education program (learning by doing) accompanied by an understanding of its scientific base (science-based). This concept can be developed according to the scheme/concept of student-centered learning, which is possible the allocation of up to 20% of class session in the form of internship in the industry. This scheme can be designed to develop students' entrepreneurial vision at the earliest stage possible.

Education that links food and health. Food system development for sustainable FS&N requires a multi-trans-disciplinary approach, especially food, nutrition, and health so that food consumption patterns are well developed as part of the efforts to build the nation's health.

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Authors

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Indonesian Academy of Food and Nutrition – Indonesian Academy of Sciences (AIPG-AIPI)
AIPG-AIPI was established based on Law No.8 of 1990 on AIPI.

AIPG-AIPI aims to assemble leading Indonesian scientists in the field of food science and nutrition to provide opinions, suggestions, and considerations on their initiatives and/ or requests regarding the mastery, development, and utilization of science and technology, especially in the field of food and nutrition to the Government and the public to achieve national goals by always prioritizing: a) values and ideals from Pancasila and the Constitution of the Republic of Indonesia 1945; b) the value of humanity; c) awareness and ethical responsibility; d) improving the quality of human and people's lives; e) the integrity of the personality of the nation; and f) the balance of the environment in sustainable development.