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FUNCTIONAL FOOD SUPPORT GOVERNMENT POLICIES TO PREVENT STUNTING

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Abstract Stunting is a chronic nutritional problem in children. The prevalence of stunting in Indonesia in 2019 is still high, namely 27.7%, still far from the WHO standard which should be below 20%. Stunting threatens the productivity of Indonesia's human resources. Overcoming it is part of an effort to protect children. The nutritional status of pregnant women and children under five is a central point in preventing stunting. The mother's knowledge about healthy food and a nutritious, diverse, balanced, and safe diet (B2SA) determines the nutritional intake of the family.
This paper is intended to reveal local functional foods that have the potential to produce healthy, healthy food to prevent stunting in the community. This paper is prepared based on a Meta-Analysis of literature studies and community good practices.
The incidence of stunting in Indonesia is not caused by food security, indicators of availability and accessibility, but rather by utilization. The utilization of local food diversity, both vegetable and animal, in Indonesia has the potential to be developed into functional food as healthy food to prevent stunting. It takes knowledge, technology, and assistance for the community to develop it.
Keywords B2SA food pattern, food security, functional food, stunting,

I. Introduction

The Ministry of Health's Basic Health Research in 2019 before the Covid-19 pandemic, recorded that as many as 6.3 million children under five in Indonesia were stunted from a population of 23 million under-five [1]. Indonesia's toddler stunting rate is in 4th place in the world with a prevalence in 2019 of 27.7 percent. The number is still far from the WHO standard value which should be below 20 percent even though it has decreased from 2018 which amounted to 30.8% [2,3]. The high prevalence of stunting means that nationally, the stunting problem in Indonesia is classified as chronic [4].

Stunting is a manifestation of chronic nutrient deficiency, both pre-and post-natal [5,6]. Stunting is characterized by a shorter height compared to children their age, the body is getting thinner with a bulging stomach, is prone to disease, and when adults are at risk for degenerative diseases and affect the level of intelligence of children [7]. The long-term consequence is that the health resilience of Indonesia's young generation will be vulnerable and can result in a general decline in national resilience, one of which is evident in Indonesia's low Human Development Index compared to other countries.

Based on many studies, the high prevalence of stunting in Indonesia is mainly due to low nutritional intake [5,8,9]. Low nutrient intake is not caused by food security, namely problems of availability, continuity, and poor distribution of foodstuffs [10,11]. However, it is mostly caused by poverty [10,12,13] which results in inability or obstruction to access existing food due to low purchasing power; low sanitation, and environmental health [14,15] which can cause infectious diseases and worsen health; as well as a low average level of education [3,9,14,16,17] which results in low knowledge of mothers and fathers about nutritious food which results in pregnant women, nursing mothers, infants and children under three years of age not getting the nutrition they need, even though the food is available. This nutritional inadequacy is due to the intake of food that is not nutritious, unbalanced, not diverse, unhealthy, unsafe, and not processed properly and correctly as well as improper and correct utilization, and others that can reduce the nutritional value of food both during pregnancy and during pregnancy. toddlers receive complementary foods with breast milk.

Indonesia is a country rich in various types of food, both animal and vegetable. With the potential for wealth, however, if the people are not healthy because of the lack of intake and knowledge of nutritious food, it is something very ironic. Food Security is a condition for the fulfillment of food for the state to individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable, and affordable and does not conflict with the religion, belief, and culture of the community. live healthy, active, and productive in a sustainable manner [10]. As in

Law no. 18 of 2012 concerning Food and Government Regulation No. 17 of 2015 concerning Food Security and Nutrition mandates the Government and Regional Governments by their authority to build, compile and develop an integrated Food and Nutrition Information System. This information is very important to provide direction and recommendations for decision-makers in the formulation of programs, policies, and implementation of interventions at the central and local levels. Food security is multidimensional, so an assessment of the food security situation requires a comprehensive measure involving a series of indicators. These indicators are combined to produce a food security composite value, which is then used as the Food Security Index. Districts in the food vulnerable group as much as 17.1% (71 districts) are indicated by i) high ratio of per capita consumption to net per capita production, ii) high prevalence of stunting under five, and iii) high poverty population [10]. Thus, as many as 82.9% of districts in Indonesia can still be classified as moderate to high food security. The high prevalence of stunting in Indonesia is an ironic thing that should not happen if people can access, reach and utilize food properly and correctly.

Nutrient-rich food interventions cannot be met with a single meal. Interventions should be started when pregnant women and children eat solid foods [5]. Nutrients from various foods must be able to meet the needs of energy, protein, calcium, iron, zinc, vitamins A, B, C, D, magnesium, phosphate, potassium, and folic acid [8,18-23].

Functional food is food which because of its active component content can provide health benefits, beyond the benefits provided by the nutrients contained in it. Functional food must meet sensory, nutritional, and physiological requirements. It is believed that functional food can prevent or reduce degenerative diseases. The physiological properties of functional foods are determined by the bioactive components contained therein, for example, dietary fiber, inulin, FOS, antioxidants, PUFAs, prebiotics, and probiotics [24-27]. Functional food, naturally or has been processed, and consumed as food or drink, has sensory characteristics in the form of appearance, color, texture, and taste that are acceptable to consumers, besides that it does not provide contraindications and does not give side effects to the recommended amount of use. against the metabolism of other nutrients [26,27].

Overcoming stunting is part of the government's efforts to protect children. Currently, Indonesia already has Law no. 35 of 2014 concerning Amendments to Law no. 23 of 2002 concerning Child Protection. This law guarantees children their rights to live and develop by human dignity (Law No.35 of 2014). Stunting is a very serious problem because it is no longer just a health problem, but a multidimensional problem that is also related to access to clean water, access to food, and parenting. This is why the problem of stunting requires the cooperation of ministries, institutions, industry, and universities to work together to synergize stunting prevention [28,29]. Indonesia is rich in food sources with bioactive components which are very potential to be developed. For this reason, it is necessary to identify functional foods, in this case, local functional foods that are around and reachable by the community that are useful in preventing and overcoming stunting.

2. Objectives

The purpose of writing is to describe functional local foods that have the potential to intervene in the supply of nutritious food to prevent and overcome stunting to support government policies.

3. Methods

This research is a descriptive study based on a review of several studies of food ingredients containing essential nutrients to prevent stunting and various types of local functional foods using the meta-analysis method. Meta-analysis research is an activity of collecting, processing, and presenting data that is carried out systematically and objectively to solve a problem or test a hypothesis by investigating existing studies by describing and examining parts of each study and the relationship of each. research to obtain conclusions and an in-depth understanding of the research studied [30]. The collection and tracing of research results are carried out both online and offline in the relevant agencies.

4. Results

The results of tracing food ingredients that contain nutrients needed to prevent stunting are presented in Table 1 below:

Table 1. food ingredients that contain nutrients needed to prevent stunting

No.	Nutrients	Type of Food Material	Reference source
1	Folic acid	Spinach, asparagus, broccoli, cabbage, celery, lettuce, kale, red beets, papaya, oranges, strawberries, tomatoes, avocado, melon, bananas, peaches, whole wheat bread, potatoes, maize, sweet potatoes, lentils, peanuts, peanuts walnuts, peas, processed soy products, chicken liver, egg yolks, salmon	[18,20, 21,31]

No.	Nutrients	Type of Food Material	Reference source
2	Vitamin A (Retinol)	daffodils, spinach, taro leaf bunkil, red spinach, genjer leaves, guava leaves, cashew leaves, long bean leaves, and other forage leaves, gandaria, long beans, kale, Chinese cabbage, pumpkin, pakcoy, seaweed, mustard greens, clover, hintalo eggplant, carrots, tomatoes apple, domestic fruit, persimmon, mango, papaya, banana, sapodilla, breadfruit, peanuts, peas, yellow potato, red sweet potato, red yam, chicken meat, duck, lamb, beef liver, chicken liver, liver sausages, various types of fish (baronang, skipjack, cork, kawalinya, clams, lehoma, malugis, crab, sardines, sunu, titang, and tuna), fish eggs, salted eggs	[18, 20, 32, 33]
3	B vitamins and their derivatives	Rice, wheat, meat, poultry, eggs, liver, soy, peanuts, vegetables, milk, kombucha, whole grains, potatoes, bananas, peanuts, chilies, tempeh, yeast, yeast in beer, and molasses	[31, 33]
4	Vitamin C	oranges, guava, kiwi, broccoli, berries, chilies, kale, peas, peppers, papaya. Persimmons, tomatoes, lychees, lemons, spinach, collards, strawberries, blueberries, etc.	[31, 34]
5	Vitamin D	Mushrooms, broccoli, salmon and sardines, egg yolks, shrimp, milk, cereal, orange juice, fish oil.	[34]
6	Vitamin E	nuts, almonds, and soybeans, avocado, mango, kiwi, corn, sunflower seeds, eggs, milk, cod and salmon, shrimp, shellfish	[35]
7	Vitamin K	green leafy vegetables, okra, asparagus, cabbage, avocado, grapes, pomegranate, kiwi, blackberries	[36]
8	Zinc	Beans, lentils, beans. Flaxseeds, pumpkin, sesame seeds, peanuts, cashews, almonds, milk, cheese, dairy products, eggs, potatoes, kale, green beans, red meat, chicken	[18,19,20,22, 34,37,38]
9	Iron (Fe)	Spinach, broccoli, potatoes, sesame seeds, soybeans, kidney beans, peas, shellfish, fish, chicken liver, meat	[18,19,20,22, 21,33,34,38]
10	Magnesium	Dark chocolate, collards, spinach, radishes, bananas, whole grains, bananas, green beans, peas, soybeans, black beans, avocado	[19,34]
11	Potassium	Avocados, bananas, oranges, tomatoes, spinach, beets, potatoes, sweet potatoes, white beans	[34]
12	Calcium	spinach, kale, turnips, mustard greens, okra, broccoli, bok choy. peanuts, lentils, soybeans, almonds, chia seeds, sesame seeds, cobs, and salmon.	[34]
13	Phosphate	Sunflower seeds, nuts, wheat, soybeans, sea fish (salmon, tuna, sardines, etc.), shellfish, chicken meat	[34]
14	Energy	Carbohydrates (rice, cassava, corn, etc.)	[34]
15	Protein	Edamame, pumpkin seeds, broccoli, quinoa, soybeans, nuts, all kinds of fish, tofu, tempeh, shrimp, lean meat, milk, Greek yogurt, oats, cottage cheese, chicken, eggs	[34]

The results of tracing several studies of local functional foods to prevent stunting are presented in Table 2.

Table 2. Local functional foods to prevent stunting

No.	Name of Food	Superior Nutritional Content	Benefits	Reference source
1	Vegetable noodles, bread, mocaf cakes, meatballs made from cassava flour mocaf	Energy 350 kcal, Dry material: 87.99, Moisture content: 12.01, Ash content: 1.44, Organic material: 98.56, Crude Protein: 3.42 g; 0.6 g of fat; carbohydrates 85 g; Fe 15 mg; food fiber 20%, vitamin B1 0.02 mg; vitamin B2 0.02 mg; vitamin B3 0.7 mg; vitamin C 2.0 mg; Ca 60 mg; vitamin P 64 mg; Na 8 mg, K 403 mg, Cu 100 mcg, Cu 0.6 mg	Hormonal balance for reproductive health, fetal / toddler bone growth, brain development	[39, 40]
2	Green Seaweed Infant Biscuits (*Caulerpa lentillifera*)	high protein, Ca, K, P, Fe, Na, K, Zn, Beta carotene, B1, Vit. C	functions as an anti-bacterial, natural body immune booster (anti-oxidant), bone growth	[41]

3	MPASI porridge, nuggets, meatballs from White Oyster Mushroom as a substitute for meat.	Protein averaged 3.5-4% wet weight, or 19-35% dry weight, better than 7.3% rice, 13.2% wheat, 25.2% cow's milk.	immunomodulators to maintain the body's resistance from disease attacks.	[42, 43]
4	MPASI porridge made from banana flour, banana chips, lunkhead	Potassium: 9% of the RDA, Vitamin B6: 33% of the RDA, B12, Vitamin C: 11% of the RDA, Vit AFolate, Magnesium: 8% of the RDA, Copper: 10% of the RDA, Manganese: 14 % of the RDA, Carbohydrates: 24 grams, Fiber: 3.1 grams, Protein: 1.3 grams, Fat 0.4 grams. High sugar	A source of energy, strengthen bones, improve brain function, improve digestion, prevent anemia	[34,44, 45]
5	Kelor Vegetable, Moringa leaf porridge, Moringa leaf biscuits for solid food	high and high enough water, protein, fiber, calcium, iron, β-carotene, total carotene, thiamine, niacin, vitamin C, phosphorus, potassium, zinc, riboflavin, sugar, magnesium, manganese, selenium, pantothenate, vitamin B6, folate	Relieves nausea during pregnancy, reduces the risk of pre-eclampsia, prevents bone loss of pregnant/lactating women, helps growth and development of fetal / toddler bones/teeth	[6]
6	Crackers, meatballs, blood clam nuggets to complement the toddler's diet	Energy, Protein, Fat, Carbohydrate, Carotene, Vit. B, P, Fe, Ca	Minimizes the risk of anemia, helps fetal development, strengthens the growth of bones and teeth, increases immunity	[6]
7	Skim milk flour for pregnant women and toddlers	The content per 100 grams is energy 36 kcal, protein 3.5 g, fat 0.1 g, carbohydrate 5.1 g, calcium 123 mg, phosphorus 97 mg, iron 0.1 mg, vitamin A 0 mg, B1 0.04 mg, C 1 mg, B2, B12, D	Optimizing fetal development; immunity (Immunity)	[34]
8	Tauco Soybean for pregnant women	energy 166 kcal, ash 6.9 grams; protein 10.4 gr, carbohydrates 24.1 g, fat 4.9 g, calcium 55 mg, phosphorus 365 milligrams, iron 6 milligrams, vitamin A 23 IU, vitamin B1 0.05 mg, vitamin B2 0.2 mg, zinc 1 mg and vitamin C 0.1 mg	Increase stamina, accelerate the recovery of anemia, keep blood sugar stable, minimize the risk of vascular disease	[34]
9	MPASI porridge, white corn noodles, lunkhead corn, Maizena	Energy, protein, carbohydrates, fiber, phosphorus, iron, copper, zinc, carotene 2.20 mg; Vitamin A 1990.00 mg; Thiamin 2.06 mg; Riboflavin 0.60 mg; Niacin 6.40 mg; Pantothenic Acid 3.36 mg, Vitamin E 11.21 mg	A source of energy prevents anemia, improves the health of pregnant women, fetal growth and development, brain and bone growth, antioxidants	[34,46, 47]

5. Discussion

The prevalence of children with stunting in Indonesia in 2015-2019 is presented in Figure 1.

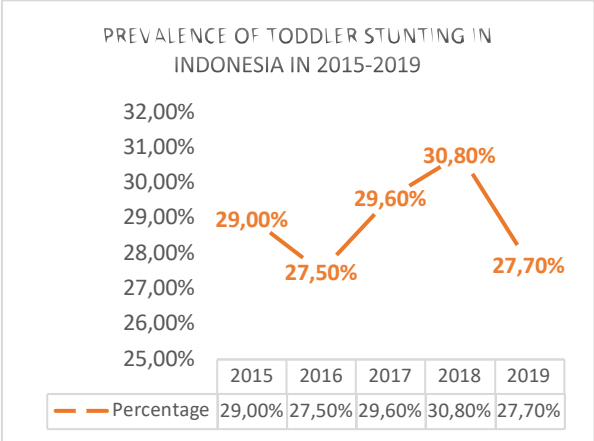

Figure 1. Stunting Prevalence in Indonesia, 2015 - 2019

Source: [1,4,7]

Based on Figure 1, the prevalence of stunting in Indonesia decreased in 2016, but increased again until 2018 and decreased again in 2019 to 27.7%. Although it has decreased, it is still above the WHO standard, namely, the maximum is 20% [4], meaning that stunting in Indonesia is still high and is a chronic incidence.

The food security index is related to food availability, affordability, safety, and food quality. Food security development has succeeded in increasing Indonesia's food security. This success has been recognized by the international community. In 2019, Indonesia ranks 62 out of 113 countries with a score of 62.6 based on the Global Food Security Index submitted by EIU, 2019 [29].

Table 3. The Score of Food Security Index in 2019

Category	Ranks	Territory	Score
Districts	1	Tabanan	90.05
	2	Gianyar	89.76
	415	Puncak	12.26
	416	Nduga	10.56
City	1	Denpasar	89.14
	2	Balikpapan	88.74
	97	Gunung Sitoli	37.46
	98	Subulussalam	17.0
Province	1	Bali	85.15
	2	DI Yogyakarta	83.63
	33	Papua Barat	30.12
	34	Papua	25.13

Source : [29]

There was an improvement in ranking compared to 2018, where Indonesia was ranked 65th with a score of 54.8 [EIU, 2018 in 29]. The food security index scores for regencies, cities, and provinces in 2019 are presented in Table 3.

Based on Table 3, the food security index score by the district is 90.05 - 10.56, city 89.14 - 17.0, and province 85.15 - 25.13. The magnitude of the difference in the index between regions shows that there is a food security gap between regions, in terms of the extent of agricultural land that has the potential to produce food in areas with a low index, there is great potential. Socialization, knowledge, and technology are needed to cultivate potential land so that food is available as well as food distribution and economic policies.

BKP [29] states that food vulnerable areas are characterized by (1). high per capita to net production per capita ratio; (2). high prevalence of stunting under five; and 3). the high number of poor people. The average number of children under five with stunting in vulnerable districts is 33.58%, not much different from food resistant districts at 33.36%. This suggests that stunting management must be more serious and more focused. According to [48], areas with 30-40% stunting are categorized as bad areas. Based on existing data, stunting cases in Indonesia are not caused by food availability and accessibility, but rather by food utilization. This is indicated by the availability of strategic food that has met needs, and the prevalence of undernourishment (PoU) index has decreased, from 10.73% in 2015 to 7.66% in 2019, where the global PoU was 10.80% in 2018. This in line with the reduction in the percentage of poverty by 0.41% from March 2018 of 9.82% to 9.41% in March 2019 [29].

Food utilization indicators measured include the percentage of children under five with stunting and life expectancy at birth and the average length of schooling for girls over 15 years. Thus reducing the prevalence of stunting in Indonesia, among others, by increasing the knowledge of mothers and fathers to increase consumption of nutritious food [3,23] for their families. Increasing knowledge can be done through socialization and community empowerment through health centers or posyandu [49], or the SUN (Scaling Up Nutrition) movement [23]. Affordable nutritious food is food that uses nutritious local food to become functional food that is easily available, easily processed, and liked by the surrounding community.

Nutritious food interventions to prevent stunting cannot be fulfilled with a single food, because every single food ingredient does not contain complete nutrients. It takes a variety of food ingredients to be able to meet the complete nutritional needs. Thus the need for knowledge of mothers and fathers about a nutritious, diverse, balanced, and safe diet (B2SA) for their families. For this reason, the government has issued the Republic of Indonesia Minister of Health Regulation No. 41 of 2014 concerning Balanced Nutrition Guidelines.

The essential nutrients needed to prevent stunting for both pregnant women and baby food include energy, protein, calcium, iron, zinc, vitamins A, B, C, D, magnesium, phosphate, potassium, and folic acid found in various food ingredients. good [8,18,19,20,21,22,23,37,50]. Sources of essential nutrients to prevent stunting are very diverse, both from plant foods and animal foods (Table 1). These foods will provide useful nutrients if they are processed properly and properly, served in a variety of ways with a balanced diet [51,52]. This diet is known as the B2SA diet.

Indonesia is rich in both vegetable and animal sources of food. Functional food is a healthy food that, apart from being

nutritious, also has a positive effect on one's health, because the food contains certain components or substances that have physiological activities that are very good for body health [26,27]. In Indonesia, well-known functional foods such as tempeh, tofu, curd, ginger, tea, milk, and others have traditionally been consumed by the public and are believed to be healthy foods that provide nutrients to maintain health.

Functional food to prevent stunting in the form of food for pregnant women and nursing mothers and solid food or drinks as complementary foods for breastfeeding for toddlers. This food can be in the form of fresh food, for example, fruits and vegetables, or processed food from both vegetable and animal sources that have the potential to be developed industrially, for example into baby porridge/biscuits, noodles, yogurt, cheese, nuggets, and others.

Studies on local functional foods to prevent stunting have also been tried a lot. Why local food? Because the food is available in the surrounding environment, is affordable and has been known and consumed by the community and maintains local culture and wisdom, as well as the community's economy. However, to better provide the nutrients needed, knowledge of processing techniques is needed, enrichment of nutrients by adding other food ingredients or substitutes, and fortification [27,53]. In Table 2, some of the results of functional food research have been developed to prevent stunting in various regions in Indonesia. Such foodstuffs include cassava flour, banana flour, cornflour, milk flour which can be processed into noodles, baby porridge, biscuits, and others; shellfish, seaweed, moringa, spinach, oyster mushrooms, apples, mangoes, carrots, nuts can be processed into dodol, nuggets, chips, biscuits, wafers, juices and others. The development of potential local functional food should be integrated in an integrated manner involving the community, food and nutrition experts, health experts, government, and industry.

6. Conclusions

The diversity of local foods, both vegetables, and animals, in Indonesia, has the potential to be developed into functional food as healthy food to prevent stunting. It takes knowledge, technology, and assistance for the community to develop it.

Stunting is a matter of public knowledge about nutrition and diet, and poverty. It is a complex problem covering multi-aspects, the encouragement and participation of all parties need to be synergized so that operational level food convergence can be obtained to achieve nutritional intake, affordability, and utilization of food to overcome stunting in Indonesia.

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