

Report on the Actual Situation of the MBG Program in Two Cities in Indonesia

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Toyo Foods Co., Ltd.

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I. General Overview

This survey was conducted by Toyo Foods Co., Ltd. (hereinafter referred to as “the Company”) with a grant from NJPPP (Nutrition Japan Public–Private Platform), with the aim of understanding the implementation status and effects of the MBG (Makan Bergizi Gratis: Free Nutritious Meals) program being implemented in Indonesia. In particular, emphasis was placed on clarifying the relationship between the school meals supply system based on the Service Unit for Nutrition Fulfillment (SPPG) and its operation at school sites, as well as the dietary behavior of children.

The survey was conducted based on survey questionnaires designed by the Company in two regions: Bogor in West Java Province and Makassar in South Sulawesi Province, with the cooperation of representative universities in each region and the approval of ethics committees (see Table 1). While both regions are under the same national program, they are suitable for comparative analysis because their geographical conditions, urban structures, operating entities, and school environments differ.

Table 1: Target Region, Survey Entity, and Survey Period

Target Region	Survey Entity	Survey Period
Bogor City	Department of Community Nutrition, IPB University; Center of Excellence of MBG	December 2025
Makassar City	Faculty of Public Health and Faculty of Agriculture, Hasanuddin University (UNHAS)	October – December 2025

The survey subjects were the SPPG and children, parents, and teachers at multiple schools in each region, and data was collected. Survey methods included on-site observation of the SPPG and interviews with stakeholders; observation of school meals distribution, consumption status, and hygiene habits at schools; interview surveys with children, parents, and teachers; and physical measurements of children (physical measurements of parents were also conducted in Bogor).

Target Schools: Schools where the MBG program delivered from the relevant SPPG has already been implemented were selected (see Table 2).

Table 2: Target Schools

Bogor	Makassar
MI Mathlaul Anwar 2	SDN Bulurokeng
MI Raudlatusshibyah	SDN Daya 1,
SDN Cemplang	SDN Tamamaung 1
	SMPN 12 Makassar

- *MI: Madrasah Ibtidaiyah (Islamic Primary School: under the Ministry of Religious Affairs)*
- *SDN: Sekolah Dasar Negeri (National Primary School: under the Ministry of Education)*
- *SMPN: Sekolah Menengah Pertama Negeri (National Junior High School: under the Ministry of Education)*

The main survey items were satisfaction with school meals, completion status, leftovers by food item, changes in eating habits, hygiene behavior, home environment, and the operational status of schools and SPPGs. In addition to analyzing regional, school, age, and gender differences based on individual data, a logistic regression analysis was conducted on the determinants of finishing vegetables (see Table 3).

Table 3: Target Area, Sample Size, Methods, and Data Items

Target Area	Sample Size (n)	Method	Data Items
Schools	3 (Bogor) 4 (Makassar)	Obtained permission from local education bureau	
Children	80 (Bogor) 80 (Makassar)	Interviews, physical measurement	Attributes, nutritional status (height/weight), taste evaluation, eating behavior, hygiene habits, overall satisfaction

Parents	20 (Bogor) 20 (Makassar)	Interviews, physical measurement (Bogor only)	Nutritional status (height/weight), household background, burden reduction effect, satisfaction, practice of food education at home
Teachers	4 (Bogor) 4 (Makassar)	Interviews	School meals operation, frequency of information transmission, measures against food waste, guidance status
SPPG	1 (Bogor) 5 (Makassar)	Interviews and direct observation	School meals operation, frequency of information transmission, measures against food waste, guidance status

This survey aims to integrally analyze the relationship between the acceptability of the MBG program and actual intake behavior, as well as the relationship between the supply system and behavioral change, beyond mere understanding of the implementation status.

Background of the MBG Program

The school-age period is an extremely important developmental stage for establishing healthy eating habits and building the foundation for lifelong health. However, a 2023 health survey in Indonesia shows that insufficient intake of vegetables and fruits remains a serious issue. Furthermore, according to the Global School-based Student Health Survey, 46.0% of students aged 13–17 consume sugar-sweetened beverages (SSB) daily, and an unhealthy food environment dominated by ultra-processed foods has become a risk to children’s long-term nutritional status and learning ability.

The MBG program is an intervention measure aimed at improving children’s nutritional intake and human capital formation. It goes beyond mere nutritional supplementation and is defined as a place for experiential learning where children learn appropriate nutritional balance, hygiene management, and social responsibility through “communal eating,” where they participate in meal distribution themselves

and eat together under the guidance of teachers, referencing the concepts of Japanese school meals and “Shokuiku” (food and nutrition education).

Survey Objectives

This evaluation survey aims to analyze the implementation status of the MBG program from multiple perspectives, with the following 7 objectives:

1. Understanding the socio-demographic characteristics and household situations of participating children.
2. Evaluating children’s perceptions regarding taste, variety, quantity, and nutritional value.
3. Evaluating children’s eating behavior, including completion rates and vegetable intake status.
4. Surveying the actual situation of hygiene and handwashing habits related to school meals.
5. Exploring parents’ perceptions, expectations, and status of involvement in the MBG program.
6. Identifying school-level implementation factors that determine children’s reactions.
7. Qualitative analysis of operational processes (menu planning, cooking, food safety, monitoring) in the SPPG.

II. Evaluation of the Implementation of Free Nutritious Meals (MBG) in Bogor City (IPB Report)

1. Survey Results

1.1 SPPG Operations and Challenges

The SPPG targeted in this survey was established in October 2025 and provides approximately 3,000 meals per day. It is operated by a foundation and consists of an SPPI (Operations Manager), a nutrition officer, an accounting officer, and approximately 50 staff members.

The menu is designed on a 20-day cycle and is created based on the standards of the National Nutrition Agency. Ingredients are procured through a daily ordering system, and a mechanism to prevent excess inventory has been adopted.

The cooking process is standardized at each stage: raw material receiving, pre-processing, cooking, portioning, delivery, collection, and washing.

Delivery starts by 7:00 AM, and used tableware is collected around 10:00 AM.

Strengths of the SPPG

- Standard Operating Procedures (SOPs) including hygiene management are in place.
- Food safety measures such as cross-contamination prevention and temperature control are thorough.
- Inventory management is performed appropriately through daily ordering.
- Delivery and collection operations are established.
- Food waste is measured and recycled.

Challenges of the SPPG

- The menu is centered on nutritional standards, and children's preferences are not sufficiently reflected.
- The mechanism for continuously reflecting feedback from schools and children is weak.
- Flexible response is difficult due to the centralized system.

- Continuous provision of nutrition and menu information is insufficient.

1.2. Survey Results Regarding Children Completion Status

The number of children who finished the entire menu was limited to 6.3%, and the completion rate was at a very low level overall. The vast majority of children left some kind of food, and children who were able to completely consume the meal were limited to a very small portion.

On the other hand, a certain number of children were confirmed to not eat at all or hardly touch the meal, indicating that there were cases falling under "insufficient intake" rather than just "partial leftovers".

Looking by food item, leftovers were biased toward specific food groups, and in particular, the leftover rate for vegetables was prominently high at 83.8%. In contrast, the leftover rates for the staple food (16.3%), animal protein (6.3%), and fruit (5.0%) were relatively low, showing that a clear difference exists in children's preferences and acceptability.

From this, it is considered that the low completion rate is not simply a matter of the quantity of the meal, but is closely related to factors concerning the quality of the school meals, such as the type of food, cooking method, seasoning, and serving temperature.

Satisfaction

"Very satisfied" was 31.3%, and "satisfied" was 62.5%, with a total of 93.8% showing a positive evaluation. "Not very satisfied" was 6.3%, and no "dissatisfied" was confirmed.

Also, the result that the satisfaction rate is at a high level of 93.8% while the completion rate remains at 6.3% shows that a prominent gap exists between children's subjective evaluation and actual intake behavior. This gap may reflect response bias due to social desirability or a situation where they "don't dislike it but can't finish it."

Furthermore, according to interviews with teachers, the main reasons for leftovers include dissatisfaction with taste or cooking methods, low preference for specific

ingredients (especially vegetables), constraints on mealtime, and some children's refusal of the school meals itself. Measures such as distributing leftover food to other children, taking it home, or distributing it to faculty and staff are being taken, but systematic measures to reduce leftovers have not been sufficiently established.

Based on the above, the low completion rate is not the result of a single factor but the result of multiple overlapping factors such as food acceptability, delivery methods, school environment, and children's preferences, and it is positioned as one of the most important challenges in future MBG program improvement.

Preferences

Students' favorite/least favorite foods: There is a tendency to prefer familiar tastes, fast food, Western-style menus, and animal proteins, and a tendency to dislike plant-based foods, vegetables, and some fish dishes.

The most popular is the "hamburger," which is the top favorite menu item (16.0%). Next, "chicken dishes" (fried chicken, sweet soy sauce sautéed chicken, chicken cutlet, etc.), "noodles" (especially chicken noodles), and fried foods are popular.

In addition, egg dishes, spaghetti, fried rice (nasi goreng), etc., are also liked. On the other hand, plant-based foods are rarely mentioned as favorite foods.

Meanwhile, the top least favorite foods are "tofu (10.5%)" and "tempeh (Indonesian fermented soybean food) (9.7%)." Vegetables in general are also very unpopular, and in particular, yardlong beans (cowpea), green beans, carrots, and leafy vegetables (spinach, water spinach, etc.) are disliked (it is reported that 83.8% of students leave vegetables in actual school meals as well).

Reasons for leaving vegetables include "disliking vegetables to begin with," "being a specific type one is not used to eating," "too much onion or tomato sauce," and "unfavorable seasoning such as bitter, bland, or sour."

Among animal proteins, "fish dishes (especially catfish)" are the most disliked. In addition, although the frequency is lower compared to meat, a certain number of students mention egg dishes (scrambled eggs, eggs with balado sauce, etc.) as disliked foods.

Note that while there are disliked menu items, more than half of the students (53.8%) answered that they “would eat even disliked foods if they knew they were nutritious,” indicating that they also have an awareness of their own health and growth (wanting to grow taller, wanting to become healthy, etc.).

Children’s Nutritional Status

Normal was approximately 65%.

Overweight and obesity were approximately 28.8%.

Thinness was approximately 6.3%.

Changes in Eating Behavior After the MBG Program

Children who answered that snacking decreased were approximately 40–50%.

Children who answered that purchasing food outdoors decreased were approximately 30–40%. On the other hand, there were also approximately 30% of children who answered that there was no change.

1.3. Survey Results Regarding Parents

Reduction of Burden

80% of parents answered that the MBG program reduced their economic and daily burdens. They evaluated that it not only saves time and effort for preparing lunch boxes but also leads to savings in children’s pocket money and snack expenses (it can be inferred that they were giving pocket money for buying snacks before the implementation of the MBG program).

Satisfaction

50% answered “satisfied” and 30% answered “somewhat satisfied,” being received positively overall. On the other hand, 20% of parents express dissatisfaction for reasons such as “nutritional bias,” “lack of menu variation,” “small quantity,” and “not to the child’s taste.”

Understanding of Home Topics and Children’s Reactions

All parents (100%) discuss school meals with their children at home, confirming whether it was tasty, what kind of menu was served, and whether they finished it without leaving anything. Through those conversations, parents recognize that "children dislike and leave vegetables" and that "they feel some menu items are not very tasty." The main sources of information regarding the school meals menu are children (55%) and the school (45%).

Requests for the MBG Program and Willingness to Pay Costs

Regarding requests for school meals, many voices call for "menu variation (65%)" and "nutritional value (60%)," followed by "seasoning for children (30%)" and "cleanliness (25%)." In response to the question of whether they have the intention to bear costs for the quality improvement of the MBG program in the future, 60% answered that they "have the intention to pay" (amounts range from less than 5,000 rupiah to more than 10,000 rupiah per meal). On the other hand, 30% answered "do not want to pay," and 10% answered "school meals are unnecessary if payment is required," indicating that there was also a segment sensitive to the incurrence of costs.

Changes in Health Aspects and Food and Nutrition Education at Home

Changes in children's health: After the introduction of school meals, 55% of parents feel that "children's weight increased," and 65% actually feel that they "became more active and healthier." In addition, 90% believe that "healthy eating habits at school promote overall healthy eating habits." Food and nutrition education at home: Only 10% of parents knew the accurate meaning of the term "shokuiku (food and nutrition education)," but 95% of parents teach children about meals and nutrition at home.

Specifically, they provide guidance on the importance of balanced meals, vegetables, and fruits, and refraining from unhealthy foods.

Physical Measurement Results of Mothers

95% (overweight 25%, obesity class I 50%, obesity class II 20%) were classified as overweight or obese, highlighting the challenge of overnutrition related to dietary life and lifestyle within the household.

Parents' Employment and Economic Status

In the survey of children (80 children), households where one parent works account for 77.4%, households where both parents do not work account for 11.3%, and households where both parents work account for 11.3%. In the survey of parents (20 parents), 52.4% are currently working, and 47.6% are not working. The distribution of monthly income (household income) of the surveyed households is as follows, with those earning less than 5-million-rupiah accounting for 75%.

- Less than 3 million rupiah: 25%
- 3 million to 5 million rupiah: 50% (the largest segment)
- More than 5 million rupiah: 25%

1.4. Survey Results Regarding Teachers

It was confirmed that teachers play an important role in the implementation of the MBG program and are involved in multiple aspects such as school meals distribution, eating guidance for children, and hygiene education.

First, regarding the distribution and transportation of school meals, although the operation differs by school, there were many cases where teachers were centrally involved. As for the transportation of school meals to classrooms, cases where teachers and children perform it jointly accounted for 50%, and cases where teachers alone or a school meals person-in-charge performs it accounted for 25% each.

From this, it was shown that flexible operation is being performed at school sites. In addition, regarding the time for providing school meals, while 75% of teachers evaluated it as "sufficient," 25% answered "insufficient," suggesting that mealtime may be a constraint in some schools.

Note that although it is not clear whether the eating time is set uniformly at each school, there are cases where it is limited to about 15 minutes, and it is difficult to say that sufficient time is always secured.

Regarding the operational status of school meals, 75% of teachers evaluated that "they are being delivered on time" and "operation is smooth," but 25% answered

that “there are problems occasionally,” and challenges in delivery stability and operational aspects also exist in some parts.

Teachers are actively encouraging children to finish their meals, and all teachers answered that they “are guiding them to eat everything.” However, despite this, the current situation where a lot of leftovers are occurring clarified that teachers’ encouragement alone is not sufficiently promoting meal completion.

Regarding the response to leftovers, measures such as distributing leftovers to other children, having them take them home, or providing them to faculty and staff are being taken. In addition, as specific proposals for reducing leftovers from teachers, the following were mentioned: bringing lunch boxes, diversifying menus, reflecting children’s preferences, and strengthening continuous food and nutrition education.

Furthermore, regarding hygiene education, all teachers are implementing handwashing guidance, and handwashing before meals was 100% thorough. On the other hand, handwashing guidance after using the toilet was limited to 50%, and variation was seen in the content of hygiene education.

In terms of information transmission, nutrition and menu information regarding the MBG program was mainly provided at the start of the program, and continuous information provision thereafter was limited. Teachers are mainly sharing information through group chats for parents, and it was confirmed that it is not being sufficiently utilized as direct nutritional education for children.

Based on the above, although teachers have an important influence on the operation of the MBG program and the behavior of children, it is suggested that current involvement is limited mainly to operational assistance and basic guidance, and has not reached more systematic involvement for encouraging changes in eating behavior.

1.5. Survey Results Regarding Hygiene

Children who had the experience of learning about handwashing were approximately 70–80%. On the other hand, there were also approximately 20–30% of children who learned it but are not practicing it. On the teacher side, handwashing guidance

before meals was implemented 100%, but handwashing guidance after using the toilet was limited to 50%.

2. Discussion, Conclusion, and Recommendations

The implementation of the MBG program in Bogor highlights the interaction of the three main participants: "parents," "children," and "teachers." By cross-checking the perspectives of these three parties, the overall picture of the strengths and challenges of the MBG program can be understood.

Parents' Perspective and Involvement

Parents are satisfied with the economic benefits of the MBG program, which reduces the burden of daily lunch preparation. However, they feel challenges regarding children refusing specific foods, leading to food loss. Information regarding menu and nutrition is mainly shared through group chats for parents, and while it strengthens community collaboration, it limits direct involvement with children. As in the case of Brazil, involving parents in menu planning will lead to increasing the acceptability of the program and reducing food loss.

Children's Reactions and the Food Loss (Leftover) Problem

Children's reactions to meals are complex. Many children eat school meals daily, but vegetables and specific proteins are often left behind. Children respond to their own preferences by sharing food with friends or taking it home. These behaviors indicate the need for a culturally sensitive menu design that balances nutrition and taste preferences. As a solution, it is important to incorporate the children's own voices into menu planning.

Lack of Communication and Food and Nutrition Education

Nutritional information is mainly received by parents and is only indirectly transmitted to children. By directly incorporating "shokuiku" (food and nutrition education) into the curriculum as in Japan, children can understand the value of school meals and cultivate long-term healthy habits. Although food and nutrition education modules for all levels of education have been developed in Indonesia, they

have not yet sufficiently permeated school sites. Additionally, leveraging the influence of the same generation, having student ambassadors promote healthy eating is also effective in reducing waste and increasing acceptability.

Role and Burden of Teachers, and Time Constraints

Teachers play an important role in the smooth distribution of meals and handwashing guidance for the MBG program. However, sufficient mealtime is not secured for some students, which could affect leftover rates and hygiene aspects. Carrying out both education and dietary guidance is increasing the workload of teachers. To reduce this burden and increase the effectiveness of the program, it is necessary to introduce support staff or student volunteers.

Overall Progress and Preparation Status of SPPG

The SPPG has already established a structured operational system covering procurement, menu planning, cooking, portioning, delivery, and waste management. As a result, basic preparations are in place for sustainable program provision and future scale-up.

Success at the School Level

The MBG program is being received favorably at school sites. Hygiene habits, including meal distribution, tray management, supervision during meals, and handwashing, are being implemented consistently according to standards. For most staff, it has not resulted in a significant increase in burden, and it is contributing to the improvement of students' lifestyle habits, reduction in snacking, and the establishment of regular mealtimes.

Identified Challenges

Identified operational challenges for the future include: 1. occasional delivery delays, 2. menu preference issues affecting food loss, and 3. variations in communication and information transmission between the SPPG and schools.

Future Outlook and Recommendations

While the MBG program is bringing meaningful benefits, room for improvement remains. It is necessary to improve menu diversity and acceptability to reduce food loss, strengthen punctuality and coordination of delivery, and expand communication among stakeholders to maintain clarity and consistency of implementation. Continuous monitoring and improvement of operational processes are essential to support the scalability of the MBG program and ensure alignment with national MBG program goals.

III. Evaluation of the Implementation of Free Nutritious Meals (MBG) in Makassar City (UNHAS Report)

1. Survey Results

1.1 Operations and Challenges of SPPG Financial Governance

Although the direct remittance mechanism from the National Nutrition Agency is highly transparent, expenditure delays occurred in the initial stages due to documentation deficiencies. Additionally, the low flexibility in budget operation and the inability to use surplus funds generated through efficiency for operating expenses are factors hindering sustainable operation.

Organization and Human Resources

While the division of roles is clear, the workload for nutritionists and accounting officers is particularly excessive, and there are cases where nutritionists handle multiple roles concurrently. Furthermore, continuous guidance to homogenize the hygiene standards of community volunteers is a challenge.

Menu Planning and Supply Chain

Attempts are being made to improve menus based on children's preferences (meat and eggs are preferred, while fish is left over), but the waste rate for fish dishes remains high at approximately 30%. Fluctuations in raw material prices and instability in supply are risks to maintaining the quality of menus.

Food Safety and Waste Management

SPPG staff recognize "cooling time after cooking" as a critical control point for preventing spoilage. When compared with data showing that 30% of parents are concerned about "food poisoning" and 15% are concerned about "food spoilage," the current hygiene management alone is insufficient for building parental trust. The introduction of HACCP (Hazard Analysis and Critical Control Point) training is urgent for stricter safety assurance.

1.2. Survey Results Regarding Children Attributes and Household Status

The average age of the target children is 11.4 years (SD 1.6), and the group is centered on upper grade levels. The average household size is 3.8 people, and at least one parent is employed in 77.4% of households. Physical measurement results recorded an average height of 132.1 cm and an average weight of 39.0 kg. Notably, parental responses suggest that 15.0% of children have a history of diagnosis with overnutrition, necessitating both countermeasures against undernutrition and prevention of overweight.

Perception of the MBG Program

Regarding children's evaluation of taste, 55.0% answered "delicious" and 36.2% answered "acceptable." Furthermore, 70.0% recognize the diversity of the menu and 76.2% recognize its high nutritional value, indicating that acceptability of the program is generally high.

Acceptability and Satisfaction with School meals

A prominent "behavioral bottleneck" was observed between perception and actual behavior. Satisfaction with school meals is evaluated in four levels: "Very satisfied," "Satisfied," "Not very satisfied," and "Not satisfied." Children who answered "Very satisfied" and "Satisfied" accounted for approximately 72% of the total. On the other hand, children who answered "Not very satisfied" and "Not satisfied" accounted for approximately 28%.

Completion Status and Leftover Tendencies

Regarding completion status, the percentage of those who always finish their school meals was limited to 27.5%, and 40.0% answered that they "only sometimes finish." The combined percentage of "always" and "often" finishing was approximately 68%. On the other hand, children who answered "sometimes finish" and "rarely finish" accounted for approximately 32%.

Regarding leftover status by food group, leftovers of staple foods and protein foods were relatively low, while vegetable leftovers were the most frequent. The percentage of those who always eat all vegetables is 32.5%, making it, along with plant-based proteins (such as tempeh), the item most likely to be discarded. Fruit leftovers remained at a low level.

Preferences Foods

Children's Preferred Foods

Children Like Animal Proteins: The most popular menu items among children were chicken, beef, and eggs. Through the introduction of the MBG program, children who previously rarely could eat chicken are now able to consume it regularly, which has led to positive reactions.

Snacks and Beverages: In daily dietary patterns outside of school meals, sugar-sweetened beverages (SSB), ultra-processed foods, snacks, and instant noodles are widely consumed. These are the primary choices for children due to their good taste, low price, and ease of access.

Foods Children Dislike (Items difficult to finish)

Vegetables: Vegetables are the component in the provided meals that is most difficult to accept and are consistently the primary cause of leftovers. The survey showed that children who finish all the vegetables provided were limited to approximately one-third (32.5%).

Fish: Menus centered on fish have a high percentage of leftovers (approximately 30%), and like vegetables, fish is cited as an ingredient where preferences vary.

It is analyzed that these preferences are influenced by habitual dietary patterns at home, cooking methods, and children's developmental stage (age). Particularly regarding vegetables, it is suggested that not only simple taste preferences but also dietary habits at home are significantly involved in actual meal completion behavior.

Relationship Between Age and Completion Status

Regarding the relationship between age and completion status, a trend was confirmed where the completion rate decreases as age increases. Especially for vegetables, while the completion rate for children aged 9 and under was 77.8%, it dropped to 43.9% for those aged 12 and over, indicating a trend where the desire to eat decreases as school grade level increases. These results indicate the possibility of an association between age and eating behavior; however, this survey is based on observational data and does not indicate a causal relationship.

1.3. Survey Results Regarding Parents

High Satisfaction and Reduction of Economic Burden

95% of parents answered "satisfied" or "somewhat satisfied" with the school meals program. Additionally, 80% evaluated it as "reducing the burden on the household," citing specific reasons such as a decrease in children's pocket money expenses (60%) and a decrease in household food costs (33.3%). Few people felt that the school meals increased the parents' own workload.

(Company Note: A previous survey conducted by this university found that households with a monthly income of less than 5 million rupiah account for 55% in this region. It can be seen that it is functioning as a social protection mechanism to reduce the economic burden on households.)

High Expectations for School Meals

Parents view school meals not as mere provision of meals, but as proper nutritional intervention. All parents (100%) expect the menu to be "high in nutritional value," and furthermore, they emphasize "menu diversity (95%)" and "cleanliness and hygiene (90%)."

Points for Improvement (Portion Size, etc.)

While satisfaction is high, the most frequently pointed out area for improvement is "portion size (70%)." Following this, they hope for improvements in "nutritional balance (20%)" and "menu diversity (10%)."

Positive Evaluation for Health and Food and Nutrition Education at Home

95% of parents believe that "school meals are helpful for children's healthy eating habits." Additionally, the percentage of households discussing school meals at home is 100%, and they actively teach children about healthy food choices and hygiene at home.

Lack of Information Sharing and Concerns Regarding Hygiene

Only 30% of parents “obtain daily menu information directly from the school,” while 70% are in a state of “hearing it from their children.” Furthermore, since some parents have concerns about food poisoning (30%) and food cleanliness/spoilage (15%), there is a need for information dissemination from the school side and the maintenance of thorough food safety standards.

1.4. Survey Results Regarding Teachers

Operational Status

In many schools, school meals are provided before 10:00 AM (75%), and all teachers (100%) are present during meals to provide guidance. On the other hand, regarding the procedures for portioning and transportation to classrooms, SPPG staff, teachers, and children are mixed, and standardized protocols are lacking.

Challenges in Information Flow

The responses stating that information transmission from the SPPG to teachers is “occasional” or “non-existent” reached a total of 75%, and the inability to grasp menu details in advance is limiting the quality of nutritional guidance by teachers.

Measures Against Food Waste

Although “educational guidance to encourage meal completion” is being conducted in 75% of schools, leftovers of vegetables and fruits have become normalized, suggesting the need for behavioral change programs that go beyond mere verbal encouragement.

1.5. Survey Results Regarding Hygiene

Comparison of Knowledge and Practice

Awareness regarding the importance of handwashing is very high at 96.2%, and the implementation rate at recommended timings is 93.8%. However, the percentage of those capable of “complete practice”—using soap and following proper procedures—drops to 72.5%, indicating a reality where knowledge does not necessarily lead to proper technique.

Guidance at School

Handwashing guidance before meals is implemented in all surveyed schools (100%), but continuous strengthening is necessary for the establishment of details such as rinsing and the use of towels.

2. Discussion, Conclusion, and Recommendations

This study provides comprehensive insights into children's perceptions, behaviors, and situational factors related to participation in the MBG program. Overall, the MBG program is widely accepted and recognized as valuable by children, parents, and schools. Many children evaluated the provided meals as delicious, diverse, and high in nutritional value, and it was confirmed that overall satisfaction with the MBG program is also high. Similarly, parents highly evaluate this program as supporting children's healthy eating habits and reducing the household economic burden.

However, while such favorable perceptions exist, an important gap is recognized on the behavioral side. Among children, the percentage of those who finish their meals remains at less than one-third, and children who regularly consume vegetables are also limited to approximately one-third. These results show that the acceptability of the MBG program does not necessarily lead to appropriate nutritional intake behavior.

Furthermore, differences in eating behavior by age were also confirmed. While younger children have a stronger tendency to finish their meals and consume vegetables, a trend is seen where that percentage decreases as age increases. This suggests that not only the evaluation of meal quality but also developmental stages and behavioral factors are influencing eating behavior.

Moreover, it was shown that the MBG program has the potential to possess broad health promotion functions. Although children recognize the importance of handwashing, the percentage practicing correct handwashing methods is limited. That is to say, a gap exists between knowledge and practice, and it is necessary to strengthen the establishment of hygiene behavior within the framework of the MBG program.

Parental involvement is an important strength of the MBG program. All parents discuss the MBG program within the home, and many provide guidance to children regarding meals and nutrition. However, the level of parents' understanding regarding nutrition varies, and a strengthening of information provision from the school regarding menu content and nutritional goals is required.

The implementation of the MBG program at the school level is generally proceeding smoothly, and it was confirmed that mealtime is sufficiently secured and teachers supervise children during meals. However, since variation is seen in the flow of information transmission and teachers' understanding, it is necessary to improve communication between schools and the SPPG and increase the consistency of implementation.

At the SPPG level, operational continuity and transparency are secured through centralized funding, clear organizational structures, and digital financial monitoring. On the other hand, challenges such as the increased workload of key staff, constraints on the flexibility of budget operation, instability of the supply chain, inconsistency in the implementation of food safety standards, and variation in food waste management are pointed out.

In summary, the MBG program is evaluated as a highly acceptable, operable, and socially valuable initiative. However, it is difficult to say that its nutritional and behavioral potential is being fully exerted. Moving forward, it is necessary to improve the quality of the MBG program through the introduction of behavioral change strategies, strengthening of nutrition and hygiene education, promotion of human resource development, and strengthening of the implementation system. Through this, it is expected to achieve a reduction in food waste while contributing maximally to children's health, learning outcomes, and furthermore, the development of long-term human capital.

Specific Proposals for Improvement

Strengthening of Food Education and Nutritional Education in the MBG Program

Incorporate age-appropriate nutritional education that emphasizes the importance of balanced meals and vegetable intake into school meals. Introduce experiential

learning such as discussing menu components, origins of ingredients, and health benefits during meals.

Strengthening of Behavioral Approaches to Encourage Meal Completion and Vegetable Intake

In response to the challenge that the percentage of those who finish their meals or eat vegetables every time is low, incorporate into the program design measures such as ideas for gradually familiarizing them with vegetables, cooking methods for children, positive examples by teachers, and appropriate verbal encouragement during meals.

Adjustment of Appropriate Portion Sizes and Menu Composition

Since many children and parents feel that the amount of school meals is small, improve the sense of fullness and completion rates by regularly evaluating portion sizes according to children's ages and required energy levels and adjusting to nutritionally balanced menu compositions.

Thoroughness of Hygiene Education and Practice

Although awareness of handwashing is high, there are cases where correct handwashing is not practiced; therefore, make correct handwashing procedures thorough through demonstrations, visual reminders, and teacher supervision.

Strengthening Information Sharing and Collaboration with Parents

While interest at home is high, information regarding the menu and nutritional goals is not sufficiently reaching them; therefore, provide clear and consistent information from the school to parents and strengthen collaboration with eating habits at home.

Improvement of Coordination and Capacity Development at the School Level

In order to eliminate variations in the level of understanding and implementation status of the MBG program among schools, implement clear information transmission, formulation of standardized guidelines, and capacity development (training) for teachers and school staff.

Adoption of an Integrated Program Model

Referencing international best practices such as the Japanese school meals and “shokuiku” (food and nutrition education) system, position it not as a mere nutritional intervention, but as a comprehensive platform integrating nutrition, hygiene, and social learning.

Strengthening of SPPG Implementation Capacity and Food Safety Systems

Increase the number of support staff to reduce the high burden on key staff, and implement continuous training on food safety and hygiene, such as HACCP. Furthermore, strengthen on-site supervision and monitoring.

Improvement of SPPG Operational Efficiency, Menu Acceptability, and Sustainability

Streamline the fund allocation process and aim for supply chain stabilization through local production for local consumption and diversification of suppliers. Also, optimize menu planning by utilizing data such as measurements of leftovers, and reduce food waste.

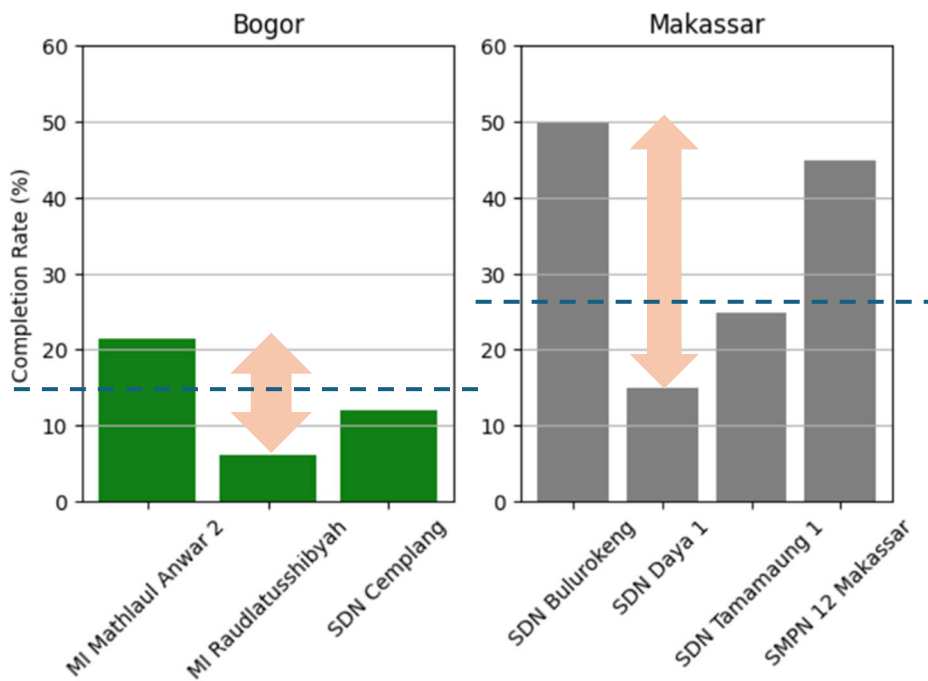
IV. Integrated Data Analysis

Up to this point, analyses for each region of Bogor and Makassar have been conducted, but below, data from both regions will be integrated, and by focusing on regional differences, factors influencing the vegetable completion rate will be examined.

Discussion Regarding the Vegetable Completion Rate

Regional Differences and School Differences

Figure 1: Comparison of Vegetable Completion Rates by Region and School



In the comparison between regions, while vegetable completion rates in Bogor are distributed at a low level overall, there are schools in Makassar that show higher completion rates, and a clear difference of approximately double was recognized between the two regions (see Figure 1).

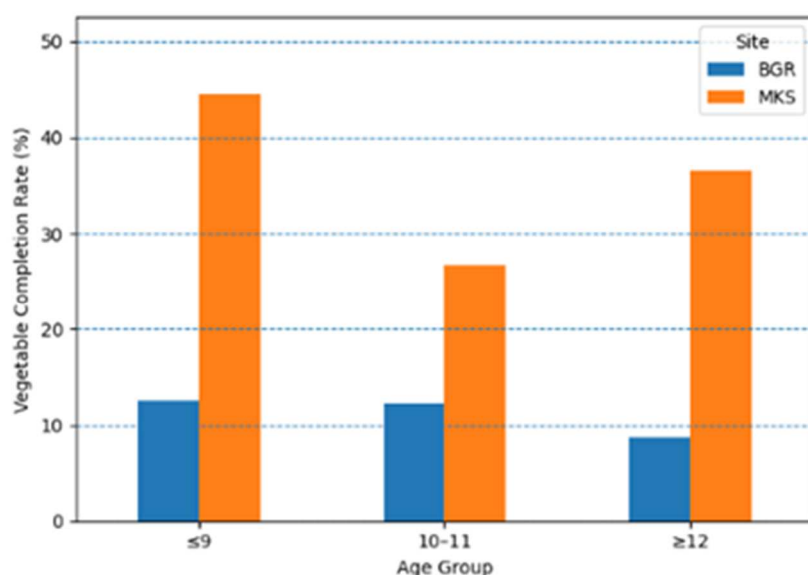
On the other hand, even within the same region, large variations in completion rates were confirmed between schools. Especially in Makassar, although they are in the same region, completion rates differed significantly from 15% to 50%.

In the same region, since the same meals are provided from the same SPPG, it is highly likely that this difference is caused not by the meal content itself, but by differences in portioning methods, guidance, the meal environment, teacher involvement, etc., at schools.

This suggests that children’s eating behavior is not determined solely by the meal content, but is greatly influenced by school-level operation and educational involvement.

Age Differences

Figure 2: Comparison of Vegetable Completion Rates by Region and Age



When analyzing the relationship between age and completion status, a trend was seen in Makassar where the completion rate, especially the vegetable completion rate, decreases for upper-grade children compared to lower-grade children (see Figure 2). That is to say, an association in the direction of increasing leftovers as age increases was suggested. Regarding this result, the significance of the association with age and region is scheduled to be verified using statistical methods in the future.

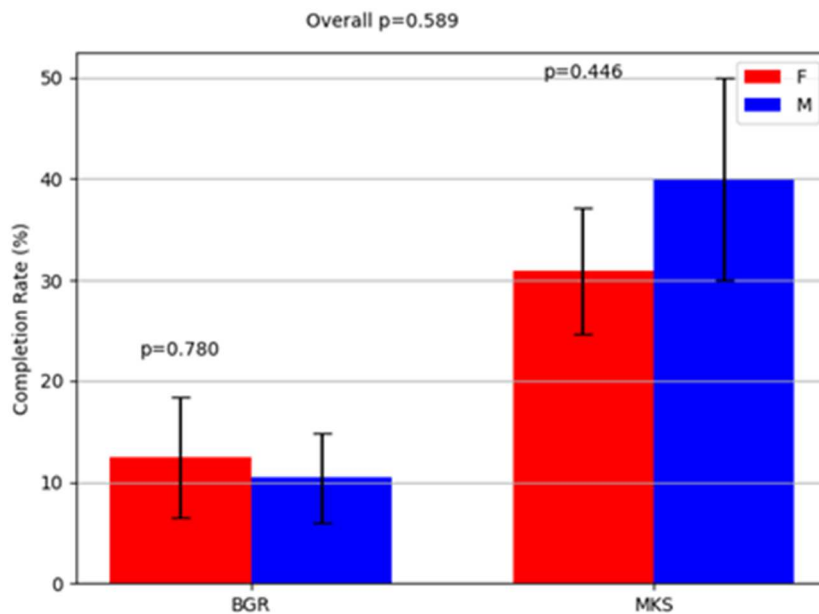
On the other hand, in Bogor, a similar clear trend by age was not confirmed, and no prominent difference in completion rates was recognized between lower grades and upper grades.

Integrating these results, the relationship between age and completion status may differ by region, and it cannot be said that a consistent correlation exists between age and completion rate, at least through the overall data of this survey.

Therefore, it is considered possible that age is functioning as a mediating factor that exerts influence in combination with other factors such as the school environment, meal content, and social background, rather than as a factor that determines eating behavior on its own.

Gender Differences

Figure 3: Comparison of Vegetable Completion Rates by Gender



As a result of analyzing gender differences, in Makassar, no large difference was recognized in completion rates between genders, and both showed similar trends. Regarding the vegetable completion rate as well, no consistent significant difference between genders was confirmed. Similarly, in Bogor, no clear difference was seen in completion rates between males and females, and the trend of many vegetable leftovers was common to both genders (see Figure 3).

Furthermore, even when data from both regions was integrated and analyzed, although differences in completion rates between genders are seen, no statistically

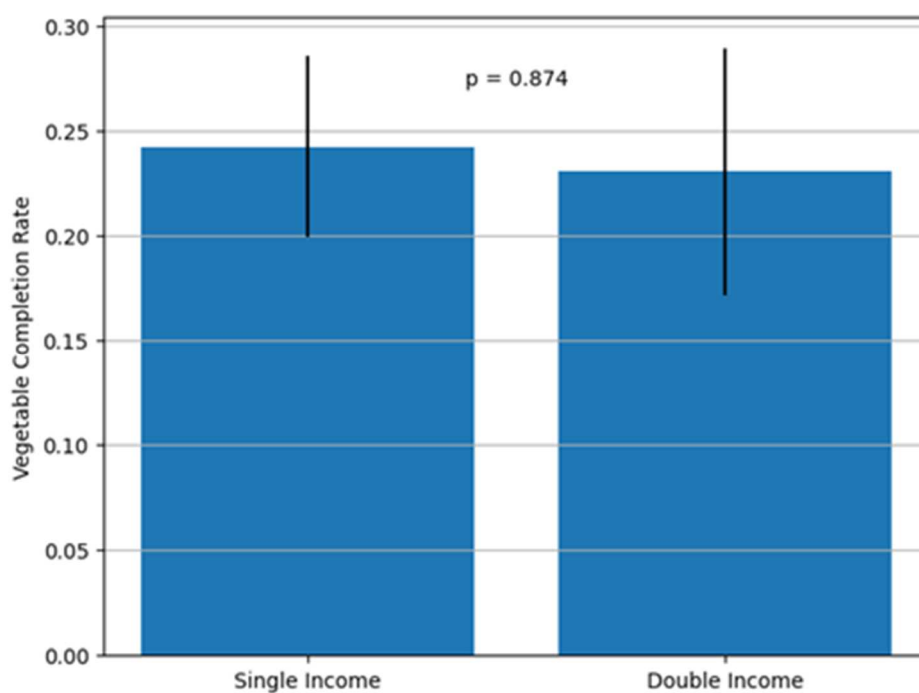
significant difference was confirmed in any region (Bogor: $p=0.780$, Makassar: $p=0.446$, Overall: $p=0.589$).

In leftover patterns by food group as well, no consistent influence by gender was recognized.

Based on the above, in this survey, it is difficult to consider gender as a major determinant for children's completion status and eating behavior, and it is suggested that factors such as the school environment, age, and regional characteristics may have a larger influence.

Household Factors

Figure 4: Comparison of Vegetable Completion Rates by Household Environment



The relationship between household employment status (single income vs. double income) and the vegetable completion rate is shown. No difference was recognized in completion rates between the two groups (24.2% vs. 23.1%), and no statistically significant difference was confirmed ($p = 0.874$) (see Figure 4).

This result suggests that children's vegetable intake behavior is not explained by socio-economic factors such as household employment status, but rather depends on structural factors such as the delivery environment of the MBG program and operation at school.

From the provisional analysis at this point, no significant differences by individual attributes such as age, gender, and household employment status were confirmed, and regional differences are suggested as a major factor. That is to say, the vegetable completion rate is not sufficiently explained by individual characteristics alone, and it is possible that the influence of structural factors such as the method of school meals provision, cooking, and the operational system is large.

In this analysis, a multivariate examination regarding the determinants of the vegetable completion rate is also being attempted, but detailed results are scheduled to be reported separately on the premise of publication as an international academic paper.

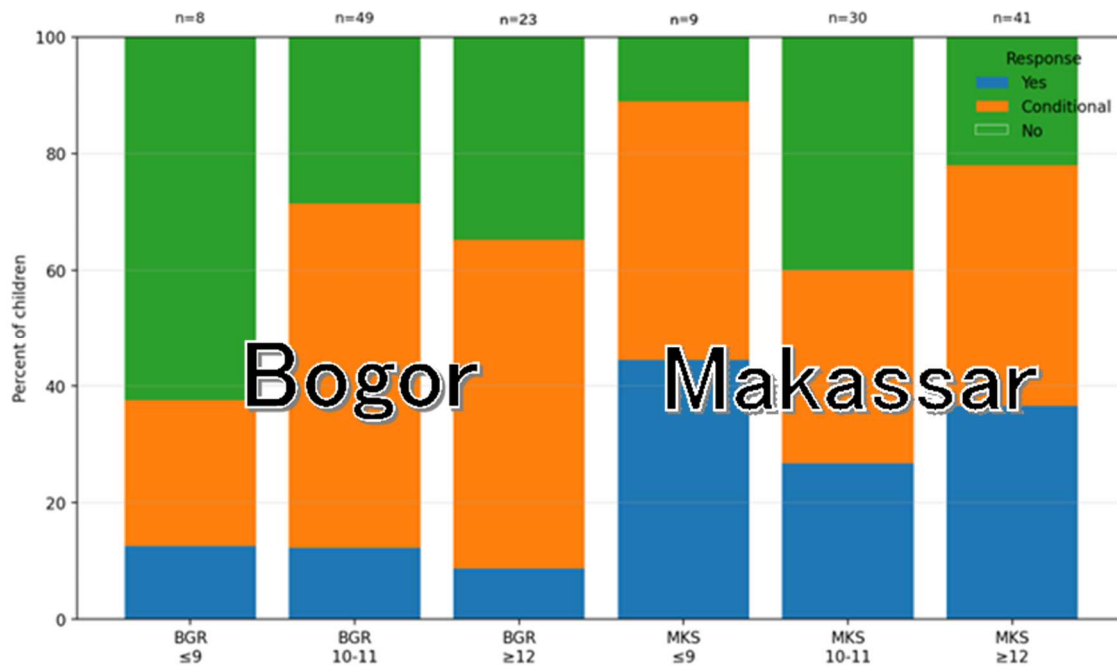
Additional Discussion

The above analysis was conducted by defining vegetable intake behavior with a dichotomy of "completion" and "other," but the question items also included options such as "finish depending on the type of vegetable" and "finish depending on the cooking method," so analysis using a trichotomy is also possible by grouping these as "conditional."

As a result, although it was preliminary, it was possible to clarify qualitative differences in children's behavior that could not be fully captured by the conventional dichotomy.

By focusing on the importance of the intermediate category "conditional," it was found that children do not reject vegetables uniformly, but change their intake behavior according to the type of vegetable, menu composition, cooking method, etc. Figure 5 shows this in relation to region and age.

Figure 5: Comparison of Vegetable Completion Rates by Region and Age



In the contrast between the two cities, looking only at completion rates, it is clear that Makassar is higher in all ages, and “dislike of vegetables” in Bogor is especially prominent among young children. However, when “conditional” is included, the difference between the two cities narrows.

Looking at the relationship with age, a trend of eating behavior changing as children grow was confirmed. While relatively simple acceptance (Yes or No) is common in young children, a trend was seen where the percentage of “conditional” increases as age increases. This is considered to reflect that children form food preferences and increase their ability to consume selectively as they develop. That is to say, eating behavior is shifting from a simple binary structure of “eat / do not eat” to a more advanced decision-making process of “select according to conditions.”

However, this change by age is not uniform, and it is important that the way it manifests differs greatly by region. In Bogor, while “conditional” increases as age rises, “Yes” and “No” are also maintained at a certain percentage, and eating behavior keeps a diverse state. In contrast, in Makassar, as age rises, “conditional”

becomes the primary category, and "No" (total rejection) tends to relatively decrease. That is to say, in Makassar, it is highly likely that children are not simply rejecting vegetables, but are shifting to a behavioral pattern of "eating but choosing."

This result causes a reconsideration of the conventional interpretation of "disliking vegetables." That is to say, it is considered that the essence of the problem is not aversion to vegetables itself, but selection behavior depending on the acceptability of the provided school meals. Especially, it is highly likely that factors such as seasoning, cooking methods, combinations of ingredients, and appearance are producing "conditional" reactions.

From this perspective, this analysis result does not negate the finding shown by the survey and analysis by UNHAS that "the completion rate decreases as age increases," but it greatly expands its interpretation. That is to say, differences by age should be understood not as a mere decrease, but as a manifestation of increased selectivity accompanying development in a form that more strongly reflects the quality of the food environment. In fact, in this survey, the age trend of the completion rate is not monotonic, and a change in behavior in the form of an increase in "conditional" is observed.

As a policy implication, this research strongly suggests the importance of menu design that is accepted by all age groups in the improvement of school meals and the MBG program, rather than just securing nutritional quantity. Especially, in order to decrease "conditional" reactions and increase "Yes," optimization of types of vegetables, cooking methods, seasoning, and provision methods is indispensable. Also, it can be considered important to lead children's selection behavior in a more desirable direction through a "shokuiku (food and nutrition education)" approach.

V. Integrated Discussion

Through this survey, it was confirmed that the MBG program has obtained high acceptability from children, parents, and schools, and is a highly socially valuable measure. In particular, from the high satisfaction level and evaluation by parents, it is clear that this program is contributing to the support of healthy eating habits and the reduction of household expenses.

On the other hand, completion rates remain at a low level, and challenges remain in actual intake behavior, such as the prominence of vegetable leftovers. Also, the result that intake behavior is not accompanying the high satisfaction level shows that a structural gap exists between the acceptability of school meals and behavior.

From the results of regional comparison and regression analysis, it became clear that children's eating behavior is more strongly influenced by supply-side and environmental factors—such as the method of provision, cooking content, provision environment, operation at school, and teacher involvement—than by individual attributes such as age, gender, and the home environment. That is to say, providing meals that meet nutritional standards alone is not sufficient for improving actual intake behavior.

Also, while the SPPG is functioning as an efficient and standardized supply system, the mechanism for sufficiently reflecting children's preferences and feedback from the site is weak, and from the perspective of encouraging behavioral change, there is much room for improvement.

VI. Summary

Based on the above, in the future advancement of the MBG program, a transition from "school meals to supply" to "school meals that make them eat" is indispensable. To that end, an integrated approach is required, including the introduction of mechanisms to encourage behavioral change, strengthening of teacher involvement, improvement of the school environment, and the rigorousness of SPPG hygiene management and strengthening of feedback mechanisms.

The MBG program has the potential to contribute significantly to children's health, learning outcomes, and furthermore, the formation of long-term human capital if appropriate improvements are made. Therefore, it is considered important to proceed with institutional design and operational improvement in a form that integrates nutrition, education, and behavioral science.

Therefore, as fields where Japan's public-private partnership is highly likely to succeed, strengthening the management and operation capacity of the SPPG to ensure the quality and safety of the MBG program, and the construction of a "shokuiku (food and nutrition education)" system beyond that, can be mentioned.

Especially, according to the technical guidelines JUKNIS revised from 2026 (see Appendix 1), related operations and responsibilities are expected to become even more advanced, and it can be said that improvement of process control and human resource development are indispensable. Specific recommendations for that are listed below.

VII. Recommendations

1. Phase 1: Establishment of Food Hygiene and Safety Management (Highest Priority)

- 1.1 The foundation of the SPPG is "safe and accident-free school meals provision."
- 1.2 Transition from individual-dependent operation to standardized system operation.
- 1.3 Consistent management based on SOP (Receiving → Storage → Cooking → Portioning → Delivery → Collection → Washing → Storage) .
- 1.4 Thorough hygiene management based on HACCP. Temperature control, cross-contamination prevention, personal hygiene, cooking control, sample preservation.
- 1.5 Ensuring traceability. Quality inspection, FIFO/FEFO, daily reports.
- 1.6 Clarification of organizational structure. Division of roles for SPPI, nutrition, food hygiene, and finance.
- 1.7 Design of a clear interface with schools (tasting, quantity confirmation, etc.).

Goal: "A state where safe and stable school meals are provided continuously."

2. Phase 2: Improvement of Menus and Cooking to Reduce Leftovers (Especially Vegetables)

- 2.1 The current maximum challenge is "the high rate of vegetable leftovers."
- 2.2 While education is important, before that, the influence of menu design and cooking is large.
- 2.3 Directions for improvement:
 - Optimization of seasoning and cooking methods.
 - Easy-to-eat shapes and cutting methods.
 - Step-by-step introduction (small quantity → getting used to it).

- Balance design of the entire menu.

2.4 Utilization of leftover data (measurement → improvement cycle).

2.5 Linking with waste management (improvement of cost and sustainability).

Goal: "While proceeding in parallel with education, first prepare 'designs that can be eaten'."

3. Phase 3: Gradual Addition of Food Education (FNE) Functions

3.1 Premise: Introduce after Phase 1 and 2 are established.

3.2 Initially, start with lightweight information provision. Sharing of menu information and nutritional information.

3.3 Food and nutrition education is not an independent activity but is integrated with operation.

3.4 Behavioral change type approach: "Teaching" → "Making them eat naturally."

3.5 Division of roles:

- SPPG: Design and information provision.
- School: Practice.
- Parents: Ripple effect on the home.

Objective: "Continuous change in eating behavior."

4 Overall Structure (Summary)

Phase 1: Safety (It's okay to eat)

Phase 2: Acceptability (Want to eat / Can eat)

Phase 3: Establishment (It becomes a habit)

By improving in this order, reliability of the system, effectiveness of nutritional intake, and behavioral change can be realized step-by-step.

Conclusion

The MBG program that Indonesia started implementing in 2025 can be said to be a grand and ambitious social policy with a scale and speed unprecedented in world history, establishing 30,000 SPPGs nationwide within three years and delivering

nutritious lunches free of charge to 83 million schoolchildren, junior and senior high school students, pregnant women, and lactating women.

On the other hand, Japan has accumulated institutional and technical know-how and experience through approximately one century of twists and turns, and has established school meals and “shokuiku (food and nutrition education)” program that is noted globally to this day. Looking from Japan, some aspects may appear overly hasty and high-risk. However, the philosophy underpinning this rapidly growing emerging nation is directly linked to the long-term national vision of realizing “Golden Indonesia” through regional agricultural and economic development as well as human resource development. This determination is reflected in the scale of investment, which allocates nearly 10% of the national budget to the initiative.

Although they have such contrasting aspects, it is hoped that a new culture of international cooperation and public-private partnership will emerge through collaboration between the two countries. Sharing common food cultures—including rice as a staple food and the widespread use of fermented foods and umami (savor taste)—the two nations have a strong foundation for working together toward the well-being of future generations and national development.

(Note: This report is basic material for the promotion of Japan’s public-private partnership and policy review, and is not intended for peer review or publication as an academic paper.)

Appendix 1. Regarding the New Technical Guidelines (JUKNIS 2026)

“JUKNIS 2026” is the “Technical Guidelines for the Governance of the MBG Program Implementation for Fiscal Year 2026” issued by the National Nutrition Agency (BGN) in January 2026. This guideline was revised from the previous guideline (BANPER 2025) in order to strengthen program management, improve accountability, and ensure consistency with national priorities.

In terms of food safety management, improvements in the institutional aspect such as standardization are expected, while at the same time, the response of equipment and human resources at the SPPG and school sites may become complicated. Main changes and stipulated contents are classified into the following 10 items.

1. Change of Guideline Name and Funding Scheme

The term “Government Assistance” was removed from the name. This is to accommodate not only government assistance but also the introduction of “special funding schemes.”

2. Change of Funding Application and Payment Mechanisms

It was completely changed from biweekly proposal submission to an “auto-charge (automatic replenishment) method” based on daily expenditure reports. The maximum balance of the SPPG’s virtual account is 500 million rupiah, and it is automatically replenished when it falls below 150 million rupiah.

3. Change of Job Titles and Terminology

“Nutritionist” was changed to “Nutrition Supervisor,” “Accountant” to “Financial Supervisor,” and “Hygiene Manager” to “Hygiene Supervisor.” Also, the term referring to digestive system problems caused by school meals was changed from “Abnormal Situation (KLB)” to “Significant Event (KM).”

4. Addition of Legal Grounds

Laws such as the National Education System Law, the Islamic Boarding School (Pesantren) Law, and the Mother and Child Welfare Law, as well as Presidential Decrees, were added as legal grounds.

5. Addition of Definitions and Terms

Definitions of new terms such as KPPG (Nutrition Fulfillment Service Bureau), formal/informal education, pesantren, and school-age children (6–18 years old) were added.

6. Change and Expansion of Target Groups

“Educators and educational staff,” who were previously excluded, were officially added as target groups for school meals. The target age for infants was adjusted from “1–5 years old” to “6–59 months,” and furthermore, “school-age children not attending school (ATS)” were also added as targets.

7. Adjustment of Program Goals for Fiscal Year 2026

The number of SPPGs was raised from 32,000 facilities to 33,670 facilities (25,400 in urban areas, 8,270 in remote areas). Also, the determination of daily, biweekly, and monthly reporting periods and the payment mechanism for facility incentives were newly introduced.

8. Change of Regional Cost Index

Previously applied only to some regions where the average price exceeded 13,000 rupiah, it came to be applied more comprehensively based on a “Regional Cost Index (IKW) table” reflecting regional characteristics.

9. Burden Categorization of Facility Repair Costs

Previously, the full amount was the burden of the foundation (the operating entity), but it was adjusted so that the foundation bears it only for the first month, and after that, it is divided between the foundation’s burden or expenditure from operating costs according to the classification of damage.

10. Other Additional Provisions

Addition of a glossary of food ingredients, provisions for vehicle rental, daily incentives for heads of schools with fewer than 100 people, strengthening of the dispute resolution process in cooperation agreements (PKS) (expanded to a 3–

stage process), etc. were included. Furthermore, incentives for volunteers on holidays, operational procedures at the Posyandu (community health center) level, checklists for food tasting tests, etc. were also added.

Appendix 2: Survey Questionnaires

1. Questionnaire for Students

For Students <English >

■ 1. Basic information

1.1 Name (optional)	
1.2 school name	
1.3 sex	<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> No answer
1.4 age	age
1.5 height	(cm)
1.6 body weight	(oz)
1.7 Number of family members	<input type="checkbox"/> 1 person <input type="checkbox"/> 2 people <input type="checkbox"/> 3-4 people <input type="checkbox"/> 5-6 people <input type="checkbox"/> More than 7 people
1.8 Are both parents working?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other()

■ 2. About school lunches

2.1 Do you find the school lunch tasty?	<input type="checkbox"/> I think so <input type="checkbox"/> I rather think so <input type="checkbox"/> I don't really think so <input type="checkbox"/> I don't think so
2.2 Do you eat all the vegetables without leaving any behind?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Depends on vegetable <input type="checkbox"/> Depends on menus
2.3 What are your favorite and least favorite menus? Please answer 3 menus for each.	Favorite menu ()()() Least favorite menu ()()()
2.4 Are the menus varied?	<input type="checkbox"/> I think so <input type="checkbox"/> I rather think so <input type="checkbox"/> I don't really think so <input type="checkbox"/> I don't think so
2.5 Is the portion size too much, too little, or just right?	<input type="checkbox"/> too much <input type="checkbox"/> too little <input type="checkbox"/> just right
2.6 Do you finish everything? If not, what do you leave and why?	<input type="checkbox"/> finish everything <input type="checkbox"/> leave vegetable <input type="checkbox"/> leave meat <input type="checkbox"/> leave staple foods <input type="checkbox"/> leave others() Reason(Free comment):
2.7 Do you think the school lunches are nutritious? Why or why not?	<input type="checkbox"/> I think so <input type="checkbox"/> I rather think so <input type="checkbox"/> I don't really think so <input type="checkbox"/> I don't think so <input type="checkbox"/> I don't know Reason(Free comment):
2.8 Would you eat disliked foods if they are nutritious?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Depends on vegetables <input type="checkbox"/> I don't know
2.9 Do you prefer school lunches or meals at home? Please answer the reason too.	<input type="checkbox"/> I prefer school lunches <input type="checkbox"/> I prefer meals at home <input type="checkbox"/> I like both equally <input type="checkbox"/> I don't like either Reason(Free comment):
2.10 Do you enjoy eating together with others? Why?	<input type="checkbox"/> Yes, very much <input type="checkbox"/> Yes, somewhat <input type="checkbox"/> Not really <input type="checkbox"/> No, I prefer eating alone Reason(Free comment):
2.11 Is there anything about your health or diet that you would like to improve? Please answer the reason too.	<input type="checkbox"/> Yes <input type="checkbox"/> No Reason(Free comment):
2.12 Is there anything about your diet that you would like to improve? Please answer the reason too.	<input type="checkbox"/> Yes <input type="checkbox"/> No Reason(Free comment):
2.13 Do you have enough time for meal breaks for eating school meals?	<input type="checkbox"/> Enough <input type="checkbox"/> Not enough
2.14 Have you noticed any changes in yourself or others since you started having school lunch?	<input type="checkbox"/> changes in eating habits <input type="checkbox"/> less snacking <input type="checkbox"/> fewer outside food purchases <input type="checkbox"/> any changes noticed <input type="checkbox"/> Others ()
2.15 Overall, how satisfied are you with the school lunch? Is there anything you wish could be improved (e.g., "I wish the lunch were more ___")?	<input type="checkbox"/> Strongly satisfied <input type="checkbox"/> Satisfied <input type="checkbox"/> Not really satisfied <input type="checkbox"/> Not satisfied (Free comment): "I wish the lunch were more()".
2.16 Why do you think school lunches were introduced?	<input type="checkbox"/> For health <input type="checkbox"/> For growth <input type="checkbox"/> No particular purpose <input type="checkbox"/> Not sure <input type="checkbox"/> Others()

■ 3. About washing hands

5.11 Have you learned how to wash your hands?	<input type="checkbox"/> I have learned something and I remember it <input type="checkbox"/> I have learned something but I don't remember it <input type="checkbox"/> I have never learned anything
5.12 Do you think it's important to wash your hands before eating?	<input type="checkbox"/> I think <input type="checkbox"/> I rather think <input type="checkbox"/> I don't think so <input type="checkbox"/> Others ()
5.13 Please choose when do you wash your hands from the list on the right. (Select all that apply)	<input type="checkbox"/> When returning home <input type="checkbox"/> After using the toilet <input type="checkbox"/> Before eating <input type="checkbox"/> Before cooking <input type="checkbox"/> Others ()
5.14 Please tell me the purpose of washing your hands. (Select all that apply)	<input type="checkbox"/> Remove dirt <input type="checkbox"/> Infection prevention <input type="checkbox"/> Habit <input type="checkbox"/> No purpose <input type="checkbox"/> I don't know <input type="checkbox"/> Others ()
5.15 Please choose your hand washing method from the list on the right. (Select all that apply)	<input type="checkbox"/> Wash with running water <input type="checkbox"/> Wash with detergent such as soap <input type="checkbox"/> Rinse the foam thoroughly with running water <input type="checkbox"/> Wipe your hands with a clean towel, etc. <input type="checkbox"/> Other ()

2. Questionnaire for Parents

This is a survey regarding dietary habits at home.*This is an item that parents or guardians are requested to respond to.

■ 1. Basic information

1.1	Name (optional)	
1.2	school name	
1.3	sex	<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> No answer
1.4	age	age
1.5	height	(cm)
1.6	body weight	(kg)
1.7	Number of family members	<input type="checkbox"/> 1 person <input type="checkbox"/> 2 people <input type="checkbox"/> 3-4 people <input type="checkbox"/> 5-6 people <input type="checkbox"/> More than 7 people
1.8	(If I may ask) Do you both work?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other()
1.9	Household annual income (monthly income)	<input type="checkbox"/> Less than 3,000,000Rp <input type="checkbox"/> 3,000,000-5,000,000Rp
		<input type="checkbox"/> 5,000,000-10,000,000Rp <input type="checkbox"/> 10,000,000Rp-

■ 2. About School Lunches

2.1	Do you talk about school lunches at home?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
2.2	If yes, what kinds of things do you talk about? For example: whether school lunches are tasty, fun, or if there are many foods you don't like, etc."	Free comment:
2.3	Has the introduction of school lunches helped reduce the burden on families at home?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
2.4	If yes, in what ways has it helped reduce the burden? For example, less effort in cooking or lower food costs.	Free comment:
2.5	Since school lunches started, has it increased the workload or burden on parents at home?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
2.6	If yes, in what ways has it increased the workload or burden at home?	Free comment:
2.7	Are you aware of the daily school lunch menu?	<input type="checkbox"/> I know because the school informs us. <input type="checkbox"/> I know from my child. <input type="checkbox"/> I don't know so I want to know <input type="checkbox"/> I don't know but I don't need to know
2.8	What do you expect for school lunch? (Select all that apply)	<input type="checkbox"/> Nutrition <input type="checkbox"/> Hygiene <input type="checkbox"/> Variety of menu <input type="checkbox"/> Allergy management <input type="checkbox"/> Others
2.9	Are you satisfied with the current school lunches?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
2.10	If NO, what makes you unsatisfied?	<input type="checkbox"/> Portion size <input type="checkbox"/> Nutritional balance <input type="checkbox"/> Concerns about hygiene <input type="checkbox"/> Others
2.11	Would it be possible for families to contribute financially if it means improving the current school lunches?	<input type="checkbox"/> Can afford if under 5,000 rupiah per meal <input type="checkbox"/> Can afford if the cost is 5,000-10,000 rupiah per meal <input type="checkbox"/> Not willing to pay <input type="checkbox"/> Prefer not to have school lunch if it requires

■ 3. About Food Education

3.1	Do you know the word and meaning of "food education". (Food education is the process of fostering individuals who can acquire knowledge about food, develop the ability to make informed food choices, and practice a healthy diet, in order to promote physical and mental health and cultivate well-rounded human development.)	<input type="checkbox"/> I know the words and their meanings <input type="checkbox"/> I know the words but don't know their meanings <input type="checkbox"/> I don't know the words or their meanings <input type="checkbox"/> Others
3.2	Have you ever had the opportunity to learn about nutrition/food education at school?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
3.3	Have you taught children about "food education" (about food and nutrition) at home?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
3.4	Do you talk about diet and nutrition at home?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
3.5	If so, what kind of topics do you discuss?	Reason (Free comment) :
3.6	What are children's impressions of school lunches?	Reason (Free comment) :

■ 4. About Children's nutrition and health.

4.1	Do you believe that the school lunches are helping your child have a healthy diet?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other ()
4.2	Since the school lunches started, has your child ever been diagnosed by a doctor as undernourished or overnourished?	<input type="checkbox"/> Overnutrition <input type="checkbox"/> Undernutrition <input type="checkbox"/> I have never been told this. <input type="checkbox"/> Others ()
4.3	Since the school lunches started, has your child experienced any of the symptoms listed on the right?	<input type="checkbox"/> Excessive weight gain <input type="checkbox"/> Weight loss <input type="checkbox"/> Easily fatigued <input type="checkbox"/> Others ()
4.4	Do you worry about your child's health?	Reason (Free comment) :
4.5	How often does your child exercise?	<input type="checkbox"/> Every day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> 3-5 times a week <input type="checkbox"/> I rarely do it

4. Questionnaire for Food Preparation Staff (Page 1)

SPPG Points to Confirm

Points to confirm	Details	Purpose
Health management for food preparation staff		
1 Are you living a regular and healthy lifestyle?	Check whether sufficient sleep, proper diet, and regular exercise are maintained.	Sleeping well, eating properly, exercising regularly, and living a stress-free life can boost your immune system and help suppress and eliminate pathogens.
2 Do you eat raw meat or bivalves?	Check whether you are eating.	Beef should be avoided due to the risk of enterohemorrhagic E. coli, chicken because of Campylobacter and Salmonella, and bivalve shellfish because they carry a high risk of norovirus infection.
3 Are your hands rough?	Check your hands for any noticeable rough spots or cuts, and record them.	Avoid beef to reduce the risk of E. coli, chicken for Campylobacter and Salmonella, and bivalve shellfish because of the high risk of norovirus.
4 Do you have nail polish, a manicure, or artificial nails?	Ensure that you do not have nail polish, a manicure, or artificial nails.	This is because bacteria easily attach, and when they come off, foreign substances get mixed in.
5 Are the hairs on your arms properly managed?	Is it long-sleeved and elastic at the cuffs?	You should wear a cooking coat with elastic cuffs or long plastic gloves to prevent body hair from getting into the food.
6 Are you wearing a mask?	Ensure that your mask is worn properly, covering both your mouth and nose.	The nostrils and mouth harbor many bacteria and viruses.
7 Are you wearing a cap?	Is it worn correctly, and does it fit properly without protruding?	Prevent contamination from hair by wearing it snugly, and make sure to cover the hair at the nape of your neck.
8 Are cooking shoes worn properly?	Are you able to change shoes for each work area? What type of shoes do you wear?	The shoes should be brightly colored, non-slip, short, and easy to put on and take off. They must be changed for each work area. Contaminated soles can carry food and bacteria from the floor, potentially transferring harmful microorganisms and food residues from one area to another and spreading contamination.
9 Are cooking clothes worn appropriately?	Check whether an apron is available, its material, and whether it is replaced in the work area.	Cooking aprons are made of fabric rather than rubber and are worn over lightweight clothing. Workers handle them carefully to avoid putting a burden on the body or getting wet. Like shoes, aprons should be changed when moving between work areas.
10 What will you do if you have a fever?	Do you take your temperature every morning and record it?	Conduct morning checks to prevent direct or indirect transmission of infections to students through food and other means.
11 What will you do if you have diarrhea, abdominal pain, vomiting, or fever?	Do you check and record it every morning?	Typical symptoms of infectious gastroenteritis include diarrhea and vomiting. Norovirus can be excreted in the stool for about 10 days. If a test is positive, you will not be allowed to cook (work suspension). Extra caution is needed if family members show symptoms such as diarrhea.
12 What should you do if you have a possible infection or lesion on your finger?	Do you check and record it every morning?	Staphylococcus aureus is present in large numbers. Do not handle food directly if contaminated.
13 How should disinfection be carried out when a patient appears?	How do you disinfect?	If a person infected with norovirus is identified, disinfect dedicated toilets, waiting areas, and cooking spaces with chlorine. Alcohol-based agents should be used for influenza and other diseases.
14 Is there a health check?	Is it done or not?	In Japan, a health check is required once a year.
15 Is the stool examination conducted twice a month?	Is it conducted or not?	several days or more than two weeks before symptoms appear. Therefore, stool testing twice a month can help determine whether you have a pathogenic microbial infection. When norovirus is prevalent, it should also be included in the test.
es and		
16 Are the facility and its surroundings cleaned regularly?	Is it cleaned or not?	If puddles and garbage are left unattended, they can attract sanitary pests.
17 Are the windows and entrances open? Are there any signs of dust, mice, or insects?	Open or not open	Because dust, animals, and insects can enter, the risk of contamination and hygiene issues increases.
18 Is the drainage system managed appropriately?	Checking cleanliness and any damage.	Clean to prevent the inflow of solids and ensure proper drainage. Make sure drainage ditches are not damaged, and repair them promptly if they are.
19 Is the toilet clean?	Checking cleanliness and any damage.	Keep clean and disinfect regularly. If there are individuals carrying norovirus or similar pathogens, regular cleaning and disinfection are expected to help prevent the spread of infection.
20 Is the water quality satisfactory and safe?	Do you conduct water quality inspections, manage the water supply system, and perform daily water quality checks?	Inspect whether water quality checks, management of water supply facilities, and cleanliness of the surrounding area are properly carried out. Confirm that water from the supply faucet is sanitized, hygienic, and safe. Measurement of residual chlorine at the start and end of operations.
Inside the kitchen		
21 Has the zoning of work areas been clearly established?	Check if zoning is done	Delivered food may carry foreign substances such as mud and dust, as well as harmful microorganisms. If washed in the contaminated work area, it can be transferred to the non-contaminated area. To prevent contamination from spreading, contaminated and non-contaminated areas are separated by walls and workbenches to control the movement of people and trolleys.
22 Are dry use and dry operation properly implemented?	Is it done or not done	Keeping the floor dry prevents secondary contamination from splashing water and reduces humidity, which helps limit the growth of foodborne bacteria. Equipment that allows for dry operation even in wet systems is installed to maintain a dry floor.

Questionnaire for Food Preparation Staff (Page 2)

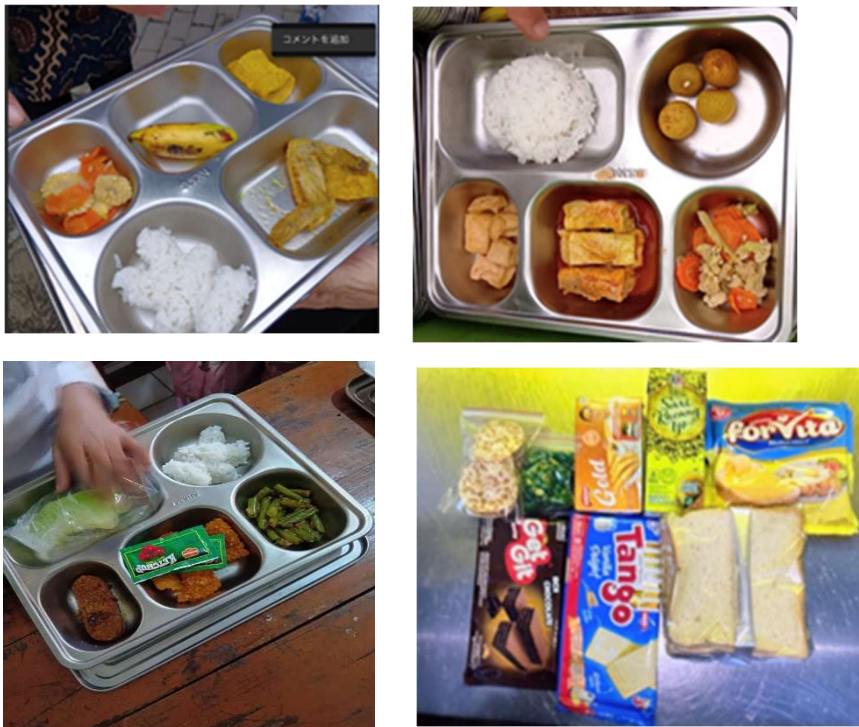
23	Are sufficient handwashing facilities available and properly maintained?	Inspect the handwashing facilities, noting the type of soap provided (solid or liquid) and whether nail brushes and paper towels are available and used.	It is necessary to improve conditions, such as ensuring that hands can be washed with hot water. Staff should also learn the purpose and importance of handwashing and how to use a brush for 4-5 people at a time. Liquid soap is recommended to prevent contamination from multiple users. Use paper towels to further reduce remaining microorganisms, and disinfect hands with alcohol.
24	Is an acceptance inspection room available for incoming food? Are records kept during inspection (such as delivery time and product temperature)?	Is there an acceptance inspection room? If not, how is the food inspected?	Inspection of food delivered from outside carries the highest risk of contamination in the work area, so it is necessary to set up a dedicated inspection room.
25	Is the workflow properly organized?	Check whether the work flow is organized	To prevent contamination at intersections, the workflow should be arranged in a single direction.
26	Are food and cooking containers stored at least 60 cm above the floor?	Inspect the height at which work is performed and confirm if there are established guidelines.	When the floor is constantly wet, bacteria and mold can develop. In heavy splashing from a height of 1 meter, bacterial contamination can reach up to 60 cm.
27	Is a toilet available for cooking staff?	Check whether it is exclusively for cooking staff or shared with students.	If a toilet is shared with students, cooking staff may become infected through it. To prevent contamination of doorknobs and other surfaces via hands after using the toilet, handwashing facilities are installed inside the private toilet rooms.
28	Are the floors, walls, ventilation fans, screen doors, hoods, and lighting fixtures properly cleaned and maintained?	Inspect the thoroughness and frequency of cleaning activities.	To maintain hygiene and prevent contamination.
29	Are the refrigerator, pantry, seasoning cabinet, and acceptance inspection room being cleaned properly?	Inspecting the thoroughness and frequency of cleaning activities.	For hygiene, it must be kept clean.
Non-contaminated areas			
30	Are air showers and adhesive tapes being used properly to remove debris and hair?	Used or not	Use air showers and adhesive tape on clothing to remove debris and hair, preventing contamination by foreign matter.
31	Are gloves properly worn and disinfected using an alcohol spray? Are the rules regarding glove use clearly defined (e.g., when handling containers or raw meat)?	Are you wearing gloves and disinfecting them properly?	This is because gloves must be worn and hands disinfected with alcohol or other methods.
Regarding cooking			
32	Are raw vegetables and fruits washed properly? Are sodium hypochlorite, electrolyzed water, or chlorite spraying used?	Is it being cleaned, or by another method?	When serving raw vegetables and fruits, normal washing is not enough to disinfect them. In Japan, sodium hypochlorite, electrolyzed water, chlorite sprays, and similar methods are used.
33	Is heating being properly conducted? Are core temperatures being measured? Are records being kept?	Check how many times the food is heated, whether there are established guidelines, and whether the temperature is measured using a thermometer.	When finishing cooking, select ingredients that are least likely to retain heat and measure the core temperature at least at three points. The core temperature should reach 75°C for at least 1 minute or an equivalent. For bivalves and other items that may be contaminated with norovirus, check that the temperature reaches 85-90°C for more than 90 seconds.
34	Is the finished product properly cooled, and is a vacuum cooler used? Are records being kept?	Inspect whether the food is being cooled properly and by what method.	When cooling food after cooking, minimize the time it spends in the optimal temperature range for bacterial growth (approximately 20-50°C). Use a cooler or divide the food into small portions in hygienic containers in a clean area to reduce the core temperature to around 20°C within 30 minutes, or to around 10°C within 60 minutes.
others			
35	Is there a procedure in place to inspect the storage and preservation of food? Are records being kept?	Check whether it is being carried out, and how it is conducted, including record-keeping.	To smoothly and reliably investigate the cause of food poisoning (including suspected foods), raw materials and cooked foods should be frozen for a certain period.
36	Are waste and wastewater properly managed and disposed of?	Describe how the waste and wastewater are managed and disposed of.	
38	Is the health of cooking (serving) staff and their household members being properly managed and monitored?	Has the issue (such as infections or diseases) been properly reported to the relevant authorities?	If a colleague or family member is infected with norovirus, they should be temporarily tested for the virus. In that case, a sensitive test such as RT-PCR should be performed.
39	Are the cooking utensils properly cleaned, and stored?	Describe how it is cleaned.	Many cases of food poisoning are caused by insufficient cleaning and disinfection of machinery and equipment.
40	Is there a checklist for equipment (mainly knives)?	Check whether it is available or not.	Inspecting knives and slicer blades before and after use ensures that no fragments (e.g., metal pieces) are mixed into the food. Keeping records of who used which cutting tool and when enables quick and reliable traceability, helping identify causes and prevent recurrence.
41	Are cutting boards and knives separated according to their use (e.g., for raw vegetables and fruits, for fish and meat, for pre-cooked vegetables)?	Check whether they are separated or not.	The level of contamination varies depending on the type of ingredient, and using the same utensils for ingredients with different contamination levels can lead to cross-contamination. To prevent this, utensils are separated according to their intended use. In order of contamination risk: Fish and seafood (including processed products) > Raw ingredients to be cooked (vegetables, tofu, etc.) > Raw vegetables (e.g., cherry tomatoes) and fruits
42	Are dishes, including lunch boxes and cutlery, properly cleaned, sanitized and stored?	Describe how it is done.	Proper cleaning and storage of dishes prevent bacterial growth.
43	Are the work schedules and workflow diagrams being created?	Check whether work schedules and workflow diagrams have been prepared.	To ensure hygienic and efficient cooking, cross-contamination should be prevented by clearly showing the tasks of the person in charge in the non-contaminated work areas. A workflow diagram helps separate highly contaminated and uncontaminated foods, preventing cross-contamination.

Appendix 3: On-site Photos

1. SPPG (Omelets prepared in advance, etc.)



2. Lunch (Processed foods delivered in bags to pregnant women and preschool children)



3. School (Handwashing, Lunch, Finding children buying food on the way home)



4. Survey scenes (As a result of conducting physical measurements of parents in Bogor as well, a tendency toward adult obesity was seen)

