



Product Evaluation of the Implementation of the Free Nutritious Meal Program for Elementary School Students in Demak Regency: A Qualitative Approach

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<p>Track Record Article</p> <p>Revised: 01 February 2026 Accepted: 07 March 2026 Published: 31 March 2026</p> <p>How to cite : Amini, M. N., Sriatmi, A., & Kartini, A. (2026). Product Evaluation of the Implementation of the Free Nutritious Meal Program for Elementary School Students in Demak Regency: A Qualitative Approach. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 8(1), 511–522.</p>	<p style="text-align: center;">Abstract</p> <p><i>The Free Nutritious Meal Program is a national initiative aimed at improving the nutritional intake of school-aged children to support optimal growth and academic achievement. This study aims to evaluate the product component of the Free Nutritious Meal Program implementation in Demak Regency using the CIPP evaluation model. A descriptive qualitative design was employed. Data were collected through in-depth interviews and direct observations conducted in two beneficiary elementary schools and the Nutrition Fulfillment Service Unit (SPPG) responsible for food distribution. Seven informants were involved, consisting of one SPPI representative, four elementary school students as program beneficiaries, and two teachers as triangulation informants, selected using purposive sampling based on direct involvement in program implementation. The product evaluation indicators included menu diversity, food acceptance, and food freshness (edibility). Observations focused on students' food consumption behavior, particularly whether meals were finished or left uneaten. The findings revealed limited menu diversity, especially in vegetable variation and cooking methods, with menu repetition occurring approximately once a week. In terms of food acceptance, students tended to prefer savory and familiar local dishes, while certain menus were less favored. Regarding food freshness, meals were generally safe to consume, but their visual appearance was perceived as less fresh and less appealing at the time of serving. These findings indicate the need to improve menu variation, sensory quality, and food presentation. Strengthening menu planning and quality control in accordance with national nutrition guidelines is recommended to enhance the effectiveness and sustainability of the program</i></p> <p>Keywords: <i>Free nutritious meal program, product evaluation, CIPP model, elementary school, Demak Regency</i></p>
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INTRODUCTION

The health and nutritional status of elementary school-aged children plays a crucial role in supporting the learning process, cognitive development, and the development of quality human resources. National data from the Ministry of Health (2023) indicate that nutritional problems among elementary school-aged children in Indonesia remain relatively high, including anemia, undernutrition, and overnutrition. Based on national health statistics, the prevalence of thinness (BMI-for-age < -2 SD) among children aged 5–12 years remains a public health concern. Furthermore, a study by Ernawati et al. (2023) found that undernutrition can hinder physical growth, cognitive development, and academic achievement. Nutritional problems in elementary school-aged children are not only reflected in anthropometric

nutritional status but can also be identified through consumption behaviors related to breakfast habits, school snacking patterns, food safety and hygiene, and access to balanced, nutritious food at home and school (Aulia, 2022). Elementary school-aged children who do not regularly eat breakfast are more likely to consume low-nutrition snacks, which put them at risk of energy and micronutrient deficiencies, impacting learning, concentration, endurance, and academic achievement (Wardoyo et al., 2025).

In response to the nutritional issues and food insecurity experienced by elementary school children, the Indonesian government launched the Free Nutritious Meals Program (MBG) as a strategic intervention to improve students' daily nutritional intake. Several studies have shown that school meal programs have the potential to improve students' nutritional status and learning capacity (Wang, 2025). The Free Nutritious Meals Program (MBG) in elementary schools has shown positive impacts on students' health status and learning motivation, as well as improved learning concentration, especially when implemented with teacher involvement and support for nutrition education (Wardoyo et al., 2025). Most previous research has focused on the program's general impact (student nutritional status/attendance), while empirical studies specifically evaluating product components at the local implementation level, particularly regarding menu diversity, acceptability, plate waste, and food freshness, are still limited. This indicates a research gap between program objectives and the quality of program outputs at the field level (Mukti et al., 2024).

Demak Regency is a semi-urban region in Central Java, characterized by coastal and rural areas, diverse socioeconomic backgrounds, and nutritional challenges for school-age children (Prabowo et al., 2025). According to the end-line survey on the nutritional status of elementary school-aged children in Central Java Province, approximately 19% of children aged 5–12 experience certain nutritional problems, including undernutrition and overnutrition (Wang, 2025). In Demak Regency itself, the rate of inadequate food consumption reached 7.59% in 2024, indicating persistent limitations in energy and nutrient intake. The MBG program in Demak Regency was officially launched on February 24, 2025, targeting 3,381 elementary school students. It is implemented through the Nutrition Fulfillment Service Unit (SPPG) in collaboration with the National Nutrition Agency (BGN).

Observations at elementary schools in Demak Regency indicate that student consumption of MBG meals is suboptimal. This is reflected in the persistent presence of plate waste, variations in food consumption among students, and reports from teachers and SPPG administrators that certain menu items are often left unfinished. This indicates a potential mismatch between the menu provided and students' taste preferences, eating habits, and meal

distribution times. Therefore, a more systematic evaluation of the quality of the MBG program's output (product) (Rofita et al., 2025) is needed.

This study uses the CIPP (Context, Input, Process, Product) evaluation model, focusing primarily on the product component. The context, input, and process components serve as supporting elements to explain factors influencing the quality of the program's products (Febria et al., 2023). The product component is operationalized through three main indicators: first, acceptability, measured by food consumption levels, plate waste, and students' responses to the taste, aroma, texture, and appearance of the food. Second, menu diversity is measured by the variety of food types in the daily menu (carbohydrates, animal/plant side dishes, vegetables, and fruit) and by menu variations between days, in accordance with the principles of balanced nutrition. Third, food freshness is measured through the time between processing and consumption, the temperature of the food when received by students, the physical condition of the food, and compliance with SOPs for food storage and distribution (Sari et al., 2026).

With this approach, this study is expected to fill a research gap in evaluating the outputs of the MBG program and to provide evidence-based recommendations for improving the quality of program implementation in Demak Regency.

METHODS

This study employed a descriptive qualitative approach using the CIPP evaluation model, with a specific focus on the product component of the Free Nutritious Meal Program (MBG) implementation in Demak Regency. The product component was selected because it reflects tangible outcomes directly experienced by program beneficiaries. The study was conducted from May to November 2025. The selected sites included SPPG Demak 1 as the food service provider and two beneficiary schools, SD N Demak 1 and SD N Demak 2. Data were collected through direct observation and in-depth interviews. Observations focused on students' food consumption behavior, particularly whether meals were finished or left uneaten. Interviews explored perceptions related to menu diversity, food acceptance, and food freshness.

Research informants consist of 7 people; among them are 1 SPPI from SPPG Demak 1, 2 students and 1 teacher from SD N Demak 1, and 2 students and 1 teacher from SD N Demak 2. Key informants consisted of SPPI staff (head of SPPG) and elementary school students who directly participated in the program. Triangulation informants included teachers responsible for supervising meal distribution. Student informants were selected based on

observed consumption behavior, representing both students who consistently finished their meals and those who frequently left meals unfinished.

Qualitative data were analyzed according to the results of observations and interviews. Data triangulation based on source triangulation (Wang, 2025). This study adhered to ethical principles for research involving human participants. Ethical approval was obtained from the relevant institutional review board. Permissions were granted by the education authorities and school principals. Informed consent was obtained from adult participants, while parental consent and verbal assent were obtained for student participants. Confidentiality and anonymity were maintained throughout the study.

Data Analysis

Qualitative data obtained from in-depth interviews and field observations were analyzed using thematic analysis. The analysis process consisted of several stages: data familiarization through repeated reading of interview transcripts and observation notes; initial coding to identify meaningful units related to menu diversity, food acceptance, and food freshness; categorization of codes into themes aligned with the product indicators of the CIPP model; and interpretation of themes to identify patterns and relationships among findings (Sitasari et al., 2025). Data analysis was conducted iteratively throughout the data collection process to ensure consistency and depth of interpretation. The credibility of the findings was enhanced through source triangulation involving students, teachers, and SPPI representatives.

Ethical Considerations

This study was conducted in accordance with ethical principles for research involving human participants. Ethical approval was obtained from the relevant institutional review board. Permission to conduct the study was granted by the local education authorities and school principals. Informed consent was obtained from teachers and SPPI representatives, while parental consent and verbal assent were obtained for student participants. All informants were assured of confidentiality and anonymity, and no identifying information was included in the research report.

RESULTS

Table 1. Characteristics of Research Informants

No	Informant Code	Role in the MBG Program	Institution/School	Role in the Study	Selection Criteria
1	I1	SPPI (Head of SPPG)	SPPG Demak 1	Key informant	Directly involved in the management and distribution of the MBG program
2	I2	Elementary school student	SDN Demak 1	Key informant	Student who consistently finished the meals (finished meal)
3	I3	Elementary school student	SDN Demak 1	Key informant	Student who frequently left meals unfinished (leftovers)
4	I4	Teacher	SDN Demak 1	Triangulation informant	Teacher responsible for supervising MBG meal distribution at school
5	I5	Elementary school student	SDN Demak 2	Key informant	Student who consistently finished the meals (finished meal)
6	I6	Elementary school student	SDN Demak 2	Key informant	Student who frequently left meals unfinished (leftover)
7	I7	Teacher	SDN Demak 2	Triangulation informant	Teacher responsible for supervising MBG meal distribution at school

This study was conducted in Demak Regency, Central Java, one of the early implementers of the Free Nutritious Meal Program (MBG), which began in February 2025. The program was implemented through SPPG Demak 1, with SD Negeri Demak 1 and SD Negeri Demak 2 as beneficiary schools. Both schools had full program coverage, with all students receiving MBG meals daily and one teacher assigned as program coordinator. Respondents were selected from Grade 6 students, as they were considered able to clearly express their perceptions of food quality and acceptance.

At SD Negeri Demak 1 (36 students), observations identified 3 students who finished their meals and 5 students who did not finish their food at all. At SD Negeri Demak 2 (39 students), 4 students finished their meals, while 3 did not finish theirs. From each school, one student who finished the meal and one who did not were interviewed to represent contrasting consumption behaviors. These respondents were considered representative because they directly experienced daily meal provision and reflected varying levels of food acceptance.

1. Menu Diversity

Observations at the SPPG Demak 1 kitchen showed that menus were prepared weekly and generally followed BGN guidelines, consisting of animal-based foods (chicken, eggs, fish), plant-based proteins (tofu, tempeh), vegetables, and fruit. However, field observations revealed limited variation in vegetable types and cooking methods. Vegetables were predominantly prepared by stir-frying, including mustard greens, long beans, broccoli, and carrots. In several instances, long beans were served for three consecutive days, although they were combined with different ingredients. Menu repetition was observed to occur approximately once per week, particularly for vegetable dishes.

These findings indicate that although food group composition met basic nutritional guidelines, limited variation in vegetable types and cooking methods reduced menu attractiveness and potentially weakened the program's role in promoting dietary diversity.

Key Informant (Student):

"The vegetables are often the same, sautéed green beans or mustard greens. Sometimes I get bored, so I don't finish them." (I3)

"If the menu includes different chicken or eggs, it's delicious. But the vegetables are often the same." (I6)

Triangulation Informant (Teacher):

"The menu is in accordance with nutritional guidelines, but the variety of vegetable dishes is still limited. Children get bored quickly if the types and cooking methods are similar." (I4)

"We see repeated vegetable menus quite often, for example, green beans for several days in a row even with different side dishes." (I7)

Key Informant (SPPI/Head of SPPG):

"Menu planning adheres to BGN guidelines, but limited ingredients and kitchen capacity mean that the variety of vegetables and cooking methods is not optimal. This is a note for improving menu rotation." (I1)

2. Food Acceptance

Observations across the two schools showed that student acceptance varied by menu type. Students generally preferred savory and familiar local foods, such as fried chicken, balado eggs, fried rice, yellow rice, and soto. In contrast, lower acceptance was observed on days when menus included stir-fried vegetables, milkfish, or galantine. Several students showed reluctance to consume these meals, with some closing the food container shortly after opening it.

Teachers confirmed that odor upon opening the food container often influenced students' willingness to eat. Observations indicated that food was prepared early in the

morning and *stored* in sealed containers until distribution at around 9:00 a.m., which intensified the aroma of certain ingredients, particularly fish and leafy vegetables.

This pattern demonstrates that students' food acceptance was strongly influenced by sensory characteristics and familiarity, suggesting that acceptance is context-dependent rather than solely determined by individual preferences.

A key informant stated:

“Fried chicken, balado eggs are usually sold out because they taste delicious. But stir-fried vegetables or milkfish, sometimes I don't eat them because they don't smell good.” (I2)

Another key informant stated:

“When I open the ompreng, the smell is quite strong, like the vegetables are old. So I don't want to eat it.” (I3)

This finding was reinforced by triangulation with teachers. One teacher stated:

“Children usually get excited immediately if the menu is chicken or eggs. But if the menu is stir-fried vegetables or fish, many complain about the smell and end up not eating it.” (I4)

Another teacher also emphasized the influence of aroma on food acceptance:

“As soon as the ompreng is opened, the aroma immediately wafts out. If the smell is strong, the children immediately comment, and some close it again without eating.” (I7)

According to interviews with key informants (SPPI/Head of SPPG), it was discovered that storage conditions also influence the aroma of the food when students receive it:

“The food is cooked from morning, around dawn until morning, then immediately packaged. Due to the distribution distance and waiting time, the aroma is stronger when opened at school, especially for fish and leafy vegetables.” (I1)

3. Food Freshness (Visual and Sensory Quality)

Field observations showed that the food served was generally still edible and showed no signs of spoilage. However, issues related to the visual freshness and appeal of the food were consistently identified. Vegetables often appeared wilted, pale, and unappetizing at mealtimes, especially mustard greens, green beans, and bean sprouts.

One key informant (a student) stated:

“The vegetables look limp and pale in color, so I don't eat them.” (I3)

Another key informant also stated:

“If the vegetables look wilted, I don't finish them because they don't look fresh.” (I6)

This finding was corroborated by triangulation with teachers. One teacher stated:

“They don't smell bad, but the vegetables look wilted, and unappealing to the children.” (I4)

Another teacher added:

“The children often comment that the vegetables don't look fresh, that their color is faded, so many don't eat them.” (I7)

According to interviews with key informants (SPPI/Head of SPPG), it was discovered that the waiting time between cooking and consumption is a factor that influences the sensory quality of food.

"The food is cooked in the morning, then packaged and waits for distribution to schools. This waiting process does make the vegetables look wilted when they reach the students."
(II)

Observationally, the time lag between cooking and consumption at school leads to a decline in sensory quality, especially for leafy vegetables. This suggests that food freshness in the MBG Program should be understood not only from a food safety perspective but also from a visual and sensory perspective, as food appearance significantly influences students' appetite and acceptance.

Triangulation Findings

Source triangulation among students, teachers, and the key informant (SPPI/Head of SPPG) showed consistent findings across menu diversity, food acceptability, and visual–sensory freshness. Students reported boredom with repetitive vegetable menus, unpleasant odors in some dishes (especially fish and stir-fried vegetables), and wilted vegetable appearance. Teachers confirmed higher plate waste with these menus and noted that the odor upon opening the containers reduced students' willingness to eat. The SPPI acknowledged operational constraints (limited ingredients, kitchen capacity, and time lags between cooking and distribution) that affect menu variation and sensory quality. These findings indicate that low acceptability is influenced not only by student preferences but also by implementation factors at the SPPG level (Wardoyo et al., 2025).

DISCUSSION

Although the MBG Program in Demak Regency meets basic nutritional standards, its effectiveness is constrained by limited menu diversity, low acceptability, and reduced visual and sensory freshness. These issues are relevant to Indonesia's broader challenges in school-aged children's nutrition, where consumption behavior and food preferences influence intake beyond nutrient adequacy (Ernawati et al., 2023). The presence of plate waste aligns with evidence that sensory quality and menu familiarity strongly affect children's consumption in school feeding programs. The impact of cooking–distribution delays further highlights the importance of process factors in shaping product quality, consistent with the CIPP framework (Nurin et al., 2025).

The findings of this study on the implementation of the Free Nutritious Meal Program (MBG) in Demak Regency indicate that the effectiveness of the program is not solely determined by the adequacy of nutritional composition, but also by implementation factors that

influence students' acceptance of the meals. The main findings include menu diversity, food acceptance, and sensory quality, which are interrelated in shaping students' consumption behavior.

Menu Diversity

The results show that the menu provided in the MBG program has generally followed nutritional guidelines established by the Food and Agriculture Organization, consisting of animal protein, plant-based protein, vegetables, and fruits. This indicates that, in terms of nutritional composition, the meals meet the basic principles of a balanced diet.

However, limited variation in menu items, particularly in vegetable types and cooking methods, emerged as a significant issue. The repeated use of similar vegetables such as green beans and the dominance of stir-frying techniques contributed to students' boredom and reduced appetite. This finding is consistent with principles in Nutrition Science, which emphasize that dietary diversity plays an essential role in improving appetite and ensuring adequate nutrient intake, especially among school-aged children.

Furthermore, research by Brian Wansink highlights that low menu variation is associated with increased plate waste. Therefore, although the meals meet nutritional standards, the lack of diversity limits their effectiveness in encouraging food consumption among students. (Riswidita et al., 2022)

Food Acceptance

The study found that students' food acceptance varies depending on the type of menu, particularly in terms of taste, aroma, and familiarity. Students showed a clear preference for familiar and savory foods such as fried chicken, balado eggs, and fried rice, while dishes such as milkfish and stir-fried vegetables were less accepted.

This finding aligns with the food preference theory proposed by Leann Birch, which explains that children's food preferences are strongly influenced by prior exposure and familiarity. Children tend to prefer foods they are accustomed to and reject unfamiliar ones.

In addition, aroma was found to significantly influence students' willingness to consume the meals. Some students refused to eat food immediately after opening the container due to strong or unpleasant smells. This is consistent with sensory evaluation theory by Harry T. Lawless and Hildegard Heymann, which states that sensory attributes such as aroma, taste, color, and texture play a crucial role in determining food acceptance. (Nusi et al., 2025)

Thus, food acceptance in the MBG program is not only shaped by individual preferences but also by the sensory quality of the meals resulting from preparation and distribution processes.

Food Freshness (Sensory and Visual Quality)

The findings indicate that although the food served was generally safe for consumption, there was a noticeable decline in visual and sensory quality, particularly in vegetables that appeared wilted and less appealing. This condition negatively affected students' willingness to consume the meals.

From the perspective of Food Science, food quality is not only determined by safety but also by sensory characteristics such as color, texture, and appearance. A decline in visual quality can reduce perceived freshness and appetite.

Research by Brian Wansink also emphasizes that visual appeal significantly influences eating behavior, as individuals often make consumption decisions based on appearance before tasting the food. (Brosch, 2021)

The reduction in sensory quality observed in this study is closely related to the time lag between cooking and consumption. Meals are prepared early in the morning, packaged, and distributed several hours later, leading to quality deterioration—especially in leafy vegetables, which are highly perishable. This phenomenon is consistent with food quality deterioration theory, which explains that storage time and conditions can affect food appearance, texture, and aroma.

Policy Implications

Menu planning should increase the variety of vegetables and cooking methods, while considering local preferences, to improve acceptability and reduce plate waste. Cooking distribution schedules should be optimized to preserve sensory quality (Ferrero et al., 2023). Routine feedback from students and teachers should inform menu improvements. Nutrition education can help increase acceptance of less familiar but nutritious foods.

Study Limitations

The study was limited to two schools, restricting generalizability. The evaluation focused mainly on the product component of CIPP, with limited analysis of context, input, and process. Acceptability was assessed qualitatively without quantitative plate waste or intake measures. Long-term nutritional and academic impacts were not evaluated.

CONCLUSIONS

The Free Nutritional Meal Program (MBG) in Demak Regency has generally met the basic nutritional requirements set by the National Education Agency (BGN). However, the quality of the program's products at the local implementation level still faces challenges in terms of menu diversity, student acceptability, and visual and sensory freshness. The lack of

variety in the vegetable menu, monotonous processing methods, strong aromas in some dishes, and the presence of less-than-fresh vegetables reduce student consumption and lead to food waste. Triangulation findings indicate that low acceptability is not solely influenced by individual student preferences but is also closely related to operational factors at the SPPG level, particularly the time lag between cooking and distribution, limited raw materials, and kitchen capacity. This confirms that the effectiveness of the MBG Program products is significantly influenced by field implementation factors.

To improve the effectiveness of the MBG Program, menu planning needs to be strengthened by expanding the variety of vegetables and processing methods, ensuring greater alignment with local student taste preferences to increase acceptability and reduce food waste. Furthermore, cooking, storage, and distribution timings need to be optimized to maintain the visual and aromatic quality of food until consumption. Regular feedback from students and teachers should be integrated into program monitoring to serve as a basis for continuous menu improvement at the SPPG level. Strengthening nutrition education in schools is also crucial to increasing students' acceptance of less familiar healthy menus, thereby achieving the goal of improving food quality more effectively through the MBG Program.

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