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Strengthening the Free Nutritious Meal Program

School-Level Evidence on Nutrition Literacy as an Emerging Mechanism

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Abstract: The Free Nutritious Meal Program (MBG) is a policy intervention aimed at meeting nutritional needs, including those of schoolchildren. However, its implementation practices at the school suggest a pedagogical dimension that could strengthen the program's objectives by fostering consumption habits and awareness. This study aims to analyze how nutrition literacy functions as a reinforcing mechanism of MBG at the primary school level. The research employs a qualitative approach with a case study design in a public primary school in East Java, using semi-structured interviews with six teachers and 27 students, observations of MBG practices, and document analysis. Data analysis employed thematic analysis to identify patterns of practice, socio-pedagogical relations, and mechanisms emerging from everyday interactions. The results showed that nutrition literacy has developed implicitly through shared eating experiences, teacher-student interactions, and the habituation of consumption, yet remains excluded from the formal curriculum. The strengthening of MBG does not occur solely through policy design, but also through relational dynamics among teachers, students, and food consumption experiences that shape school-level mechanisms. These findings affirm that schools function as nodes for translating the policy into students' concrete learning experiences, thereby positioning nutrition literacy as an emergent mechanism and practical medium for reinforcing the MBG program rather than merely a knowledge output. This study provides empirical contributions regarding the importance of a school practice-based approach in formulating strategies to strengthen MBG.

Keywords: Free Nutritious Meal Program; Nutrition Literacy; Pedagogical Practices; School-Level Mechanism.

1. Introduction

The Free Nutritious Meal Program (MBG) is positioned as a strategic step in human resource development toward the vision of Indonesia Emas 2045, as it improves schoolchildren's nutritional status, thereby impacting their health and cognitive development (Prasetyo et al., 2025; Sarjito, 2024). Beyond its nutritional objective, the program situates schools at the intersection of public health policy and everyday educational practice, where meal distribution interacts with learning routines, social interactions, and students' behavioral habits. Within this intersection, school practices become an important site where policy intentions are interpreted and enacted in daily activities. Several studies have shown that MBG enhances motivation, concentration, and readiness to learn (Arifin et al., 2025; Pancani & Ningsih, 2025; Sudadio et al., 2025). However, these studies largely focus on outcomes of nutritional provision rather than examining how everyday school practices shape the educational dimensions embedded within the program.

Normatively, MBG is not solely designed as a nutritional intervention, but also mandates nutrition education and changes in consumption behavior. This is reflected in the National Nutrition Agency's General Guidelines for the System and Governance of the MBG program and the Nutrition Education Module within the MBG program, which emphasize the integration of nutrition education and food literacy, regular delivery of nutrition messages, and school involvement as a channel for conveying healthy living values (Badan Gizi Nasional, 2025; Kemendikdasmen, 2025). These documents also emphasize educational goals as an inherent part of the program, including increasing student attendance and academic achievement, while strengthening knowledge of balanced nutrition. Thus, beyond its distribution function, MBG implicitly contains pedagogical expectations that rely on how schools translate policy guidelines into everyday practices.

In practice, implementing MBG in schools is not merely an administrative activity. Shared mealtimes, menu choices, informal conversations among students, and teacher guidance demonstrate that the school meal program operates within an educational ecosystem rich in social and pedagogical meaning (Forbes et al., 2025; Long & Hung, 2024; Ülker et al., 2024). These routine interactions resemble informal learning processes that may function as a hidden curriculum, in which values and habits are transmitted implicitly through daily routines rather than through formal instruction (Mao et al., 2025; Ng et al., 2024). Consequently, school meal practices can be understood as socio-pedagogical spaces through which students gradually construct meaning, preferences, and awareness related to food and health.

Thus, MBG effectiveness is determined not only by menu quality and accurate distribution, but also by integrating consumption experiences into daily practices. At this point, it is important to distinguish between nutritional knowledge as mastery of basic information, nutrition education as the pedagogical process of delivering material, and nutrition literacy as the capacity to understand, assess, and habituate to consumption choices in context and sustainably (Silva, 2023; Unal et al., 2025). Within school contexts, nutrition literacy can be observed through practices such as students' understanding of menu choices, discussions about food during shared meals, and the gradual formation of healthier consumption habits. This literacy dimension has the potential to bridge policy mandates with long-term behavioral development.

Within this framework, nutrition literacy is a key concept that distinguishes between simply conveying information and developing the capacity to make decisions about consumption. Nutrition literacy involves three main domains:

functional (understanding basic information), interactive (communicating and adapting information), and critical (assessing and questioning nutrition information in social and cultural contexts) (McNamara et al., 2021; Nuampa et al., 2025). This perspective positions nutrition literacy as an adaptive capacity that develops through social experiences and concrete decision-making, not simply through exposure to formal information. From a situated learning perspective, such literacy emerges through participation in everyday activities in which students interact with peers, teachers, and food-related practices. The involvement of teachers, families, and communities is crucial for nutrition literacy, enabling children to form healthy eating habits from an early age (Fransisca, 2024; Hawkins et al., 2021).

Although the normative framework has accommodated the educational dimension of nutrition, the MBG literature in Indonesia is still dominated by administrative, logistical, and macro-evaluative studies that position schools more as policy recipients than as interactive spaces that actively mediate program objectives (Agustini et al., 2025; Erlinawati, 2025; Marnia et al., 2024; Pambudi, 2024). Secondary data-based studies and conceptual analyses are also more numerous than empirical explorations of daily practices at the school level (Sarjito, 2024; Shiddiq & Effendi, 2025). Empirical studies are emerging but generally focus on impact evaluation (Supnawadi et al., 2025; Tangkudung, 2025). While these studies provide important insights into program performance, they offer a limited explanation of how policy objectives are translated into everyday socio-pedagogical practices within schools. Consequently, the processes through which students' consumption experiences, teacher guidance, and collective routines interact to shape nutrition literacy remain insufficiently understood.

This gap highlights the need to examine MBG not only as a policy intervention but also as a process of policy enactment within school environments. From this perspective, policies are not implemented linearly but are interpreted and translated through the interactions of actors, institutional routines, and local contexts. Understanding these micro-level processes is crucial for identifying how program strengthening actually occurs in practice. Policy effectiveness is often determined by the relational dynamics and collective experiences formed among teachers, students, and the learning environment (Cairney & Toomey, 2024; Rachmadio & Nugraha, 2025). Nutrition literacy has the potential to become a medium for habituation and negotiation of the meaning of consumption, influencing how students view food and health.

Based on this framework, this study offers a novel approach by positioning nutrition literacy as a program-strengthening mechanism that emerges in daily school practices. The study's objective is to analyze how nutrition literacy functions as a school-level mechanism in strengthening MBG through shared meal practices, socio-pedagogical relationships, and students' consumption experiences. Specifically, the study examines how routine mealtime interactions, teacher facilitation, and peer engagement serve as mechanisms that link policy intentions to students lived experiences. This study's contribution lies in empirically mapping the micro-mechanisms that bridge the normative policy framework with actual learning experiences in schools, thereby enriching the discourse on educational food policy, which has so far focused more on logistical and macro-evaluative dimensions.

2. Methods

This study employs a qualitative, school-level case study design to gain an in-depth understanding of how the Free Nutritious Meal Program (MBG) operates within

everyday school practices and how nutrition literacy reinforces MBG implementation at the micro level. The case study design enables a focused exploration of a specific institutional context to trace relational dynamics, pedagogical practices, and interaction patterns that shape program effectiveness, prioritizing contextual and conceptual understanding over statistical generalization. Research took place at SD Negeri Bubulan II, Bojonegoro, East Java, between January and February 2026. This site was selected because of the routine implementation of MBG at the school, enabling exploration of actual practices, implementation variations, and social interactions surrounding school food consumption as the primary unit of analysis.

Participants comprised six teachers and 27 students selected through purposive sampling using predefined criteria relevant to the study objectives. Teachers were selected because they were actively involved in implementing the MBG program, including roles in meal distribution, supervising students during mealtime, and providing nutrition-related guidance. Teacher interviews focused on pedagogical roles, decision-making regarding consumption practices and nutrition education, the integration of mealtime activities with learning, and perceptions of the program's function. Students were selected from those who regularly participated in the MBG activities and represented varied responses to the provided meals, such as acceptance, preference, or hesitation to consume, to capture diverse experiences of the program. Student interviews highlighted experiences receiving and consuming food, understanding menu choices, social interactions during MBG, and perceived changes in habits. This purposive composition enabled the study to capture variations in experiences among program facilitators and recipients, as well as the dynamics of everyday practices surrounding MBG implementation at the school level.

Data collection techniques included semi-structured interviews, direct observation of MBG practices, and documentation studies. Interviews used open-ended questions to elicit in-depth experiences and perceptions. Observations focused on food distribution, teacher-student interactions, consumption habits, and informal nutrition literacy practices. Documentation included menus, implementation schedules, school archives, and relevant policy documents and nutrition education modules. These three techniques complemented each other to capture both actual practices and their institutional context.

Data analysis used thematic analysis following the Braun and Clarke framework, with manual coding through the following stages: (1) data familiarization; (2) initial code formation related to MBG practices, nutrition literacy, and actor interactions; (3) grouping codes into categories; (4) developing conceptual themes; and (5) synthesizing themes to map school-level mechanisms and directions for strengthening MBG. The process was conducted iteratively to maintain traceability between raw data and thematic construction.

Data validity was maintained through triangulation of sources and techniques by comparing teacher-student information, confirming interviews through observation, and checking document consistency. Double-checked interpretations were conducted throughout the analysis to ensure accuracy. Ethical considerations were implemented through informed consent, anonymization, and institutional permission from the school to ensure participant confidentiality and academic integrity.

3. Results and Discussion

3.1. Empirical Context of MBG Implementation at the School Level

While MBG implementation at the school level appears to be a linear administrative activity, in practice it involves more complex socio-pedagogical dynamics. MBG does not function solely as a nutrition program; rather, it creates a micro-ecosystem that shapes how students interact with food, teachers, and school norms. This finding aligns with the program's normative framework, which positions MBG not only as a food intervention but also as a medium for education and behavior change toward healthy and sustainable eating patterns. However, the educational dimension tends to operate implicitly within everyday routines rather than through formally articulated pedagogical structures.

Operationally, schools integrate MBG into scheduled routines such as break times or learning transitions. Teachers rarely refer explicitly to formal mandates, yet they remain involved through supervision, guidance, and spontaneous explanations. One teacher stated:

> "So far, it has been a personal initiative; there is no agreement or direction from the principal (Teacher 3)."

> "Sometimes, when students do not finish their meal, I spontaneously explain (Teacher 2)."

These responses indicate that nutrition education guidelines have not fully become operational references in daily practice. Instead, pedagogical actions emerge situationally from teachers' professional judgement. In this sense, teachers function as mediators who translate policy intentions into micro-level interactions, illustrating how policy enactment occurs through the interpretive practices of local actors rather than through regulatory texts alone. This is consistent with empirical findings on policy enactment, in which teachers translate policy into classroom routines, tactics, and interactions through classroom observations and method selection (Silseth et al., 2023; Skerritt et al., 2023).

From the students' perspective, MBG generates recurring sensory and social experiences. Eating together becomes a collective event that encourages conversation and negotiation of taste. One student stated:

> "I try each item one by one, and if it is tasty, I eat it; if not, I don't eat it (Student 6)."

This interaction illustrates how MBG becomes a meeting point between domestic eating habits and the institutional food environment. Rather than replacing family influence, the school context expands students' exposure to new foods and shared consumption norms. These experiences suggest that everyday meal practices can operate as an initial site where preferences and attitudes toward nutritious food begin to form, positioning MBG as an informal sensory learning environment.

The empirical context also reveals that the teacher's role extends beyond technical supervision. The presence of teachers during mealtimes tends to legitimize certain consumption norms and encourage dialogue about food choices, whereas their absence often leads to more individualized eating practices. This pattern

indicates that relational interaction rather than procedural structures primarily shapes the pedagogical dimension of MBG. Consequently, the effectiveness of nutrition-related learning during MBG depends less on formal instruction and more on the quality of everyday engagement between teachers and students.

At the institutional level, schools generally position MBG as part of their compliance with national policy. However, compliance does not necessarily produce a uniform interpretation of the guidelines. Schools operate as interpretive sites where national policies are translated into local practices (Lundqvist & Westerlund, 2024). Variations in supervision, dialogue, and integration with other school activities suggest that the guidelines function primarily as a broad framework rather than as a detailed operational script. These differences reflect the degree to which school actors internalize the program's objectives.

Taken together, these findings indicate that MBG gradually transforms from a nutrition fulfillment initiative into a pedagogical policy space through the accumulation of routine practices. This dynamic resembles the operation of a hidden curriculum, in which learning emerges from social experience rather than explicit instructional goals (Mao et al., 2025; Ng et al., 2024). Within this context, MBG implicitly shapes eating habits and collective norms while also creating opportunities to develop basic nutrition literacy. However, because these processes rely largely on individual initiative rather than systematic integration, the pedagogical potential of MBG remains uneven. Thus, MBG implementation reflects two interconnected layers: a relatively stable policy framework and a fluid socio-pedagogical space shaped by the interpretations and interactions of school actors.

3.2. Participation Nutrition Literacy Practices in MBG

Observations of MBG practices in schools indicate that nutrition literacy is rarely articulated as an explicit instructional objective. Instead, it emerges through students' participation in shared mealtime routines where food, interaction, and school norms intersect. Knowledge about menu items, consumption habits, and attitudes toward food develops through repeated engagement rather than through formal teaching sessions. In this context, nutrition literacy should not be understood merely as the transmission of nutritional information, but as a situated capacity to interpret and practice food choices within everyday school experiences. This pattern reflects the broader orientation of MBG, which normatively includes educational and behavioral change dimensions, yet in practice operates primarily through habituation and routine interaction.

Table 1 illustrates several practical pathways for implementing nutrition literacy practices in the MBG setting. These practices suggest that nutrition literacy formation is distributed across multiple actors and interactions rather than confined to formal instruction. The dominant patterns observed are functional and habituative dimensions, where students learn to recognize food items and gradually develop a willingness to try them. Reflective and critical dimensions, such as evaluating nutritional value or discussing food choices more analytically, remain less visible in everyday practice. In line with the nutritional literacy framework, functional literacy is often supported by reliable sources of information, making it easier to learn and apply in everyday life. In contrast, critical literacy demands more complex analytical skills (Nuampa et al., 2025). This indicates that MBG currently operates primarily as a space for exposure and habit formation rather than as a structured environment for critical reflection on nutrition.

Table 1. Synthesis of Nutrition Literacy Practices in the MBG Implementation at the School Level

Practice Dimensions	Dominant Activity	Main Actor	Emerging Literacy Characters
Situational dialogue	Answering student questions and providing simple explanations about the menu	Teacher	Functional (recognizing, naming)
Sensory experience	Tasting new menu items and comparing flavors	Student	Habitual (being used to trying)
Peer conversation	Discussing among students about taste, menu items, and eating habits	Student	Social (preference negotiation)
Learning integration	Linking the MBG menu to health-themed learning activities	Teacher	Contextual

Teacher narratives further illustrate how nutrition literacy develops through micro-level pedagogical moments embedded in daily routines. One teacher explained:

> "Sometimes I explain about the food, its nutritional content: carbohydrates, protein, and so on ... (Teacher 3)."

These responses demonstrate that nutrition-related explanations emerge as situational interventions rather than planned instructional activities. From an analytical perspective, such moments function as informal pedagogical mediation, where teachers translate the immediate eating experience into basic nutritional understanding. The pedagogical value of MBG, therefore, lies less in structured curriculum delivery and more in these recurring interactions that connect food consumption with meaning-making, reflecting how nutrition literacy can develop through practice-based engagement rather than formal instruction (Silva, 2023; Unal et al., 2025).

From the students' perspective, nutrition literacy development is evident in changes in attitudes toward food. Students reported increased willingness to try unfamiliar menu items and reduced resistance toward certain foods, particularly vegetables. These responses indicate that nutrition literacy in this context involves cognitive recognition and social-affective processes such as curiosity, peer influence, and collective encouragement (McNamara et al., 2021). Shared mealtime interactions, therefore, function as a social environment that shapes students' willingness to experiment with food, thereby contributing to the formation of consumption habits over time. Such dynamics are consistent with the social learning perspective that emphasizes the role of social experience in shaping behavioral change (Khushk et al., 2022).

Despite these positive dynamics, the structure of practice reveals an imbalance between experiential learning and systematic educational integration. Connections between MBG practices and formal academic learning are sporadic and depend largely on individual teachers' initiative. As a result, nutrition literacy remains an emergent outcome rather than an institutionalized component of school learning. This gap suggests that while MBG provides a fertile environment for literacy development, its pedagogical potential is not yet fully organized within a coherent educational framework. Normatively, however, opportunities for integration exist through intracurricular, co-curricular, and extracurricular activities that could more deliberately connect meal experiences with structured learning.

Theoretically, these findings align with the concepts of situated learning and communities of practice, in which knowledge develops through participation in repeated social activities rather than through abstract instruction (Hannington & Govender, 2024; Pereira, 2023). MBG can therefore be interpreted as a shared community of eating practices in which students gradually acquire basic nutritional

understanding through collective routines. However, the literacy that emerges tends to remain at the level of habituative engagement rather than reflective-critical analysis. This reveals a productive paradox: nutrition literacy within MBG is not always formally designed as a learning objective, yet it exerts tangible influence on students' food-related attitudes and behaviors. In this sense, MBG operates less as a conventional nutrition education program and more as a socio-pedagogical ecosystem that shapes students' understanding of food through repeated collective experiences.

3.3. Relational Patterns of Strengthening MBG through Nutrition Literacy at the School Level

If the empirical findings indicate the presence of a latent pedagogical space and nutrition literacy practices develop primarily through habituation, then the sustainability of MBG's impact depends largely on the relational patterns embedded in school practices. Strengthening the program does not occur mainly through the addition of formal instructional materials, but through the quality and consistency of interactions surrounding communal mealtime practices. In this context, nutrition literacy functions not merely as the acquisition of knowledge but as a relational mechanism that connects experience, interaction, and habituation to students' consumption behavior. This interpretation aligns with MBG policy's broader orientation, which positions nutrition education and behavioral change as integrated dimensions of program implementation rather than isolated instructional components (Badan Gizi Nasional, 2025).

Interview data suggest that when teacher–student interactions become dialogic, MBG shifts from a routine compliance activity into a meaningful learning space. Teachers who ask students why food remains unfinished or encourage them to try unfamiliar menu items create opportunities for reflective engagement rather than simple supervision. One teacher stated:

> "If we often tell students, every time there is a new menu, they will want to try it. However, if we do not explain it, they usually will not (Teacher 4)."

This interaction illustrates how nutrition literacy is negotiated through interpersonal relationships rather than transmitted as static information. The teacher–student relationship, therefore, serves as a form of pedagogical legitimacy, in which behavioral influence arises from trust and relational proximity. Such dynamics reflect broader perspectives on policy enactment and classroom mediation, in which educational policies gain practical meaning through the interpretive actions of local actors (Silseth et al., 2023; Skerritt et al., 2023). In this sense, strengthening MBG occurs when nutrition-related messages are embedded within repeated relational interactions rather than delivered through isolated instructional sessions.

The relational dimension also appears in how students interact with food itself. Food within the MBG context is not experienced as a neutral nutritional object but as a socially interpreted entity that evokes preferences, taste identities, and collective evaluation. When students discuss menu items, compare them with meals from home, or comment on taste and texture, they are constructing symbolic relationships with food.

> "I am happy because I got the MBG. I can eat with friends (Student 16)."

> "When they eat together, I see some students become more united and able to share (Teacher 2)."

These responses indicate that food-related attitudes emerge within a social environment rather than solely through individual cognition. From a learning perspective, such interactions resemble social modelling processes in which behavioral change occurs through observation and collective participation (Khushk et al., 2022; Mukhalalati et al., 2022). The communal nature of mealtimes, therefore, creates conditions in which experimentation with unfamiliar foods is socially supported, gradually shaping students' acceptance of balanced nutritional practices. In this respect, MBG contributes to the formation of consumption norms that extend beyond the immediate act of eating.

Another relational layer concerns the relationship between schools and the broader policy framework governing MBG. Schools do not merely act as logistical distribution points; they also function as interpretive institutions that determine the pedagogical intensity of program implementation. When nutrition literacy is incorporated into the broader school culture, MBG gains a more sustainable educational dimension. Conversely, when the program is framed primarily as a technical obligation of food distribution, literacy-related practices tend to remain incidental. One teacher described this situation:

> "At school, the teacher's job is to distribute food, but there really needs to be real education for the children, not just providing food, but also providing knowledge about nutritious food (Teacher 5)."

This observation highlights how institutional interpretation influences program outcomes. Research on policy implementation similarly emphasizes that the impact of educational initiatives depends heavily on how local actors interpret and integrate them within institutional routines (Lundqvist & Westerlund, 2024). Thus, the sustainability of nutrition literacy practices within MBG depends less on the existence of policy documents than on how schools translate these guidelines into everyday educational practices.

Analytically, these relational dynamics can be conceptualized as a reinforcing mechanism operating through three interconnected channels: teacher pedagogical legitimacy, students' collective eating experiences, and institutional support from the school environment. These elements do not function independently but form a mutually reinforcing network. Teachers provide interpretive guidance that connects food with meaning, students contribute social dynamics that shape behavioral acceptance, and schools provide the institutional conditions that sustain these interactions. Nutrition literacy operates as the mediating element linking these channels, offering teachers a framework for explanation, students a context for experiential learning, and schools a conceptual basis for integrating MBG within their broader educational mission. The synthesis of these relational dynamics is illustrated in Figure 1.

From this perspective, strengthening MBG through nutrition literacy cannot be reduced to adding curricular content. Rather, it should be understood as a relational process that simultaneously produces meaning, habits, and shared norms. The program's effectiveness, therefore, depends less on intensifying instructional interventions and more on sustaining meaningful interactions around communal eating practices. This interpretation positions MBG as a policy whose transformative

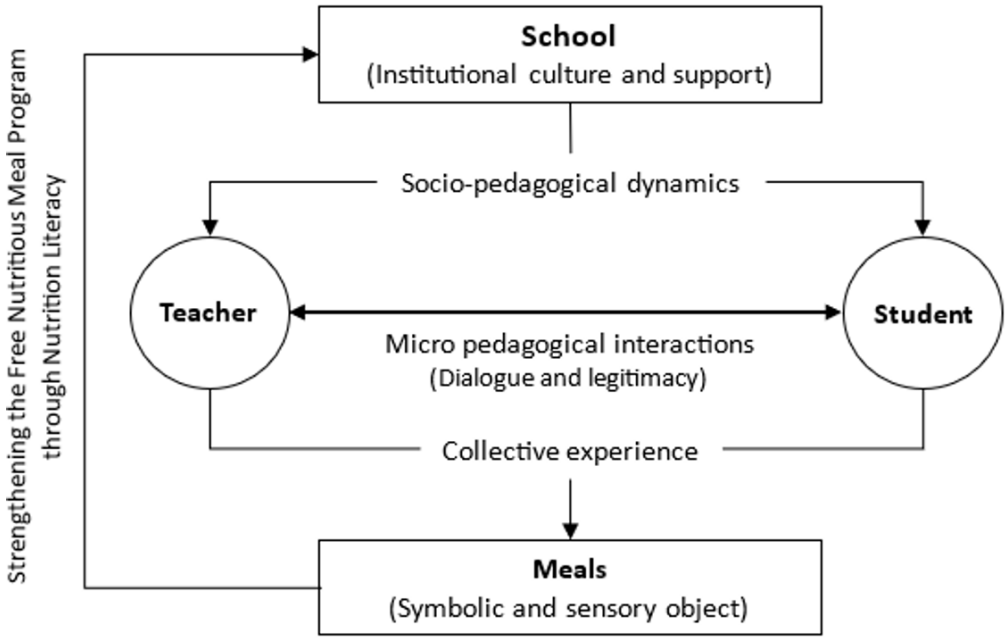

Figure 1. Relational patterns in strengthening MBG through nutrition literacy

capacity emerges not only from program design or food provision, but also from the network of social relationships through which it is enacted at the school level. Through these relational processes, MBG gradually contributes to the formation of more sustainable and health-oriented consumption behaviors among students.

3.4. School-Level Mechanisms in Strengthening MBG

The findings suggest that nutrition literacy practices and relational interactions observed in MBG implementation do not occur in isolation but rather form a relatively coherent configuration. This configuration indicates the presence of a school-level mechanism, understood as a recurring operational pattern that connects actors, everyday processes, and gradual behavioral outcomes. In this sense, strengthening MBG at the school level does not emerge from sporadic initiatives but from repeated socio-pedagogical practices embedded in daily school routines. Such mechanisms represent a micro-level enactment of the program's normative mandate, in which nutrition education and behavioral change become implicit dimensions of implementation, even when they are not formally organized as structured learning activities.

A synthesis of the empirical findings indicates that this mechanism operates through three interrelated components: actors, processes, and intermediate outcomes. Teachers function as pedagogical mediators who interpret and communicate nutrition-related meanings; students participate as active agents who experience and negotiate food practices; and schools provide the institutional environment that enables the continuity of these interactions. The processes connecting these actors include consumption monitoring, brief explanatory dialogues, shared habituation during mealtimes, and occasional links to classroom learning. Rather than producing formal curricular outputs, these processes generate intermediate outcomes such as the gradual stabilization of eating habits, increased familiarity with menu variations, and emerging awareness of the role of nutrition in daily life.

"I learned that healthy and nutritious meals are very important for our bodies (Student 10)."

"The change I felt was that I started to like eating vegetables and fruit because they are very healthy (Student 3)."

From an evaluative perspective, this pattern reflects a context–mechanism–outcome relationship, where behavioral outcomes emerge from the interaction between the school context and the actions of participating actors. In this configuration, the provision of food serves as the immediate trigger, while the surrounding social interactions generate the socio-pedagogical mechanism that produces behavioral change. Such dynamics correspond with broader perspectives in nutrition literacy research, which emphasize that sustainable dietary behavior is shaped not only by knowledge transmission but also by repeated engagement with food environments and social practices (Silva, 2023; Unal et al., 2025). Thus, the MBG program creates a practice-based environment where literacy, behavior, and institutional routines gradually converge.

Another important characteristic of this mechanism is its latent and adaptive nature. The mechanism does not necessarily appear as a formally codified procedure but functions through collective awareness and repeated habits embedded in everyday school life. Adaptability becomes evident when teachers adjust their dialogue strategies in response to students' responses or when schools connect MBG activities to broader themes such as hygiene, discipline, or health awareness without explicit program instructions. Such flexibility reflects how educational policies are often enacted through locally interpreted practices rather than through rigid implementation models (Lundqvist & Westerlund, 2024; Skerritt et al., 2023). Consequently, the school-level mechanism should be understood not as a closed operational structure but as a flexible network of practices oriented toward the gradual formation of conscious consumption habits through nutrition literacy.

Conceptually, these dynamics illustrate embedded pedagogy, in which learning processes emerge through routine participation in everyday activities rather than through explicit curricular labeling. Unlike formal instruction that relies on clearly defined learning indicators, embedded pedagogical mechanisms generate educational effects through the continuity of experience and interaction. In the MBG context, the act of eating together becomes more than a biological activity; it functions as a socially mediated learning moment in which values related to health,

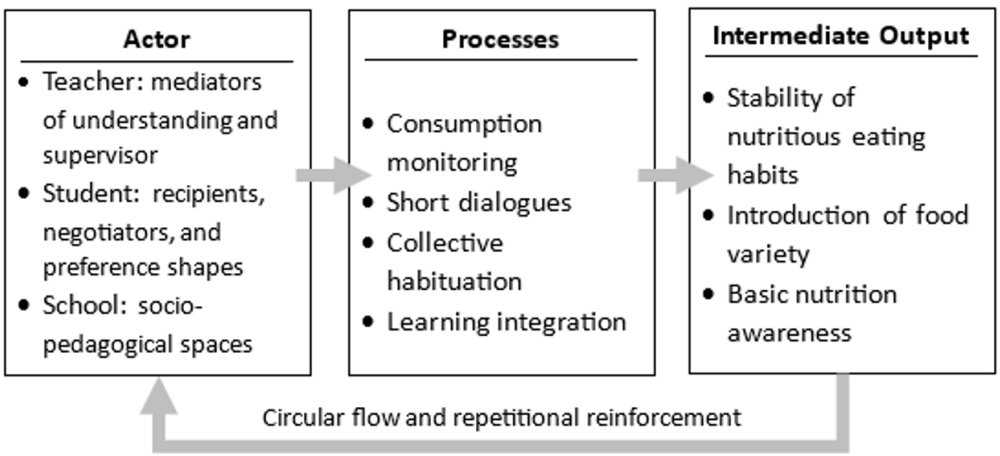

Figure 2. School-Level Mechanisms for Strengthening MBG with Nutrition Literacy

food choices, and collective behavior are implicitly constructed. A visualization of this synthesis of school-level mechanisms is presented in Figure 2.

The existence of such mechanisms explains why MBG's influence can persist even when explicit educational sessions are limited. Its reinforcing capacity lies primarily in recurrence and relational continuity, rather than in the intensity of instructional interventions. As long as teachers, students, and institutional practices continue to interact within a relatively stable framework of shared routines, intermediate outcomes, such as improved food acceptance and increased awareness of nutritional value, can gradually accumulate. When one component weakens, the mechanism does not necessarily collapse; however, its reinforcing effect on behavioral change becomes less pronounced.

Overall, the identification of school-level mechanisms highlights that the effectiveness of nutrition policies cannot be explained solely by macro-level program design or the distribution of meal packages. Instead, policy outcomes are also shaped by micro-level operational patterns embedded in everyday educational practice. From this perspective, MBG demonstrates how a public nutrition policy can achieve sustainability by integrating social interaction, collective habituation, and repeated sensory experience. These mechanisms constitute a latent but influential operational model through which the program gradually contributes to the formation of students' nutritional awareness and healthier consumption habits.

3.5. Variation in Practice and Implementation Limitations

Although the previous sections demonstrate relatively consistent school-level mechanisms, empirical evidence also shows that strengthening MBG through nutrition literacy is not uniformly enacted across school contexts. Variations emerge in the intensity of teacher involvement, institutional coordination, and students' responses to shared eating practices. These variations suggest that the mechanisms identified earlier remain contextually embedded rather than fully institutionalized, meaning that their continuity depends largely on local interpretation and actor engagement. Similar patterns are often observed in policy implementation studies, where program outcomes vary because actors interpret policy guidelines differently within their institutional environments (Lundqvist & Westerlund, 2024; Skerritt et al., 2023).

One prominent source of variation lies in the reliance on individual teacher initiative. Dialogues about nutrition, reinforcement of eating habits, and incidental links to classroom learning frequently depend on teachers' availability and personal commitment. One teacher stated:

> "When I have free time, I usually help distribute, but in class, I relate it to the physical education subject (Teacher 2)."

This response indicates that the continuity of nutrition literacy practices often depends more on individual effort than on stable institutional arrangements. In this situation, literacy practices become vulnerable: they can develop rapidly when a proactive actor is present but may weaken when that actor is absent. From an implementation perspective, this condition illustrates that translating policy guidelines into everyday pedagogical routines remains uneven, reflecting a gap between formal program design and operational enactment at the school level.

Variation is also evident among students, whose responses to MBG are shaped by taste preferences, family eating patterns, and prior experiences with certain foods.

Not all students immediately accept menu items, and some continue to resist specific foods. One student stated:

> "Sometimes I eat it, sometimes I give it to my friend (Student 8)."

This statement illustrates that the development of nutrition literacy does not necessarily produce linear behavioral change. Sensory experience, domestic habits, and cultural food preferences remain influential factors that schools cannot fully control. Research on nutrition literacy similarly emphasizes that food-related behaviors are shaped by broader social environments rather than solely by knowledge acquisition (Silva, 2023; Unal et al., 2025). Consequently, MBG operates within a negotiated space where institutional norms intersect with individual preferences and household food cultures.

Another limitation concerns the absence of widely shared pedagogical operational standards that explicitly connect MBG implementation with nutrition literacy objectives. While reference documents and guidelines exist, their practical interpretation varies significantly across schools. As a result, literacy-related practices often remain implicit and dependent on individual actors' interpretations rather than on clearly institutionalized routines. This condition creates a paradox: the program's pedagogical potential is both normatively supported and empirically observable, yet it is not consistently activated because of the gap between policy documents and everyday practice. Such dynamics are frequently highlighted in studies of policy enactment, where formal regulations alone cannot guarantee consistent outcomes without local interpretive alignment (Silseth et al., 2023).

Analytically, these variations indicate that the school-level mechanisms identified earlier operate within a semi-institutional phase. They already demonstrate recognizable patterns and normative support but lack the operational stability required for consistent implementation across contexts. In practical terms, MBG has generated observable micro-level behavioral shifts among students, yet the distribution of these impacts remains uneven. The strength of the program, therefore, depends not only on policy design but also on the quality of policy dissemination and the capacity of school actors to interpret and operationalize guidelines within their institutional routines.

Understanding these variations allows the MBG position to be interpreted more proportionally. The program cannot be assumed to automatically produce equitable nutrition literacy outcomes, yet it cannot be reduced to a purely logistical food-distribution initiative. Instead, MBG represents a policy with demonstrable transformative potential that requires stronger dissemination processes and clearer operational translation to ensure that its educational dimension is more consistently realized across school contexts.

3.6. Strategic Direction and Policy Implications

The integration of findings from empirical context, literacy practices, relational dynamics, school-level mechanisms, and implementation variations suggests that strengthening MBG does not require fundamental policy redesign. Instead, the primary need is to recognize and reinforce the latent mechanisms already operating within schools. Existing practices, institutional routines, and normative guidelines provide a sufficient foundation for program development. The main challenges lie in uneven internalization, limited dissemination, and incomplete translation of policy guidance into everyday school practices. Consequently, the strategic direction

involves light institutionalization, where existing practices are stabilized and supported without significantly expanding bureaucratic structures.

At the school level, strengthening strategies can be embedded within existing educational activities rather than introduced as additional curricular burdens. Teachers do not need to assume the role of formal nutrition instructors; however, they require clear legitimacy and concise operational guidance to sustain everyday practices such as micro-dialogues, collective supervision of meals, and simple connections between menus and health concepts. One teacher stated:

> "I agree with making it a routine to eat together so that it is easier to control the class and we can provide guidance together (Teacher 6)."

This observation indicates that the primary barrier is not teacher capacity but the lack of simple, institutionally recognized operational frameworks. Practical recommendations at this level, therefore, include concise micro-guidelines, examples of contextualized good practices, and internal school policies that legitimize existing routines without increasing instructional hours.

At the institutional level, an important strategic implication is positioning MBG within the school's broader health-promoting culture rather than merely an administrative obligation. When nutrition literacy is embedded in existing norms related to hygiene, discipline, and healthy lifestyles, it becomes more sustainable. This perspective aligns with the whole-school approach to health promotion, which emphasizes integrating health practices into the overall educational environment rather than treating them as isolated interventions (Balasooriya Lekamge et al., 2025). Within this framework, MBG reinforcement can be achieved through structured communal mealtimes, light supervisory roles for teachers, and alignment with existing health and wellbeing programs.

At the policy level, the primary implication is not the introduction of new regulatory frameworks but the refinement of implementation orientation. Current program discourse often emphasizes food distribution logistics and nutritional standards, while the educational dimension receives less operational attention. Strengthening the policy, therefore, requires practical educational scaffolding that is easily replicable within school contexts. Examples include short dialogue prompts for teachers, simple explanations linking menus to basic health concepts, visual communication materials, and examples of effective school practices. These tools can support translating policy goals into everyday interactions without imposing additional administrative burdens on schools.

Operationally, the findings point toward three interconnected recommendations. First, strengthening policy literacy at the school level is essential so that teachers and administrators understand both the existence and the educational purpose of MBG guidelines. Second, disseminating flexible micro-implementation tools can help schools integrate nutrition literacy practices into daily routines without requiring extensive curricular restructuring. Third, a lightweight feedback mechanism based on brief reflections and documentation of good practices can help share experiences across schools without creating complex reporting requirements. These measures serve to bridge macro-level policy design and micro-level school practices while maintaining administrative efficiency.

In practical terms, strengthening MBG at the school level depends primarily on the consistency of everyday practices rather than on introducing new formal structures. Teachers can reinforce nutrition literacy through short but repeated

dialogues, collective supervision during meals, and simple explanations that connect menu items to health concepts. School leaders play an important role in legitimizing these practices through light internal policies, such as scheduled communal mealtimes or rotating supervision responsibilities. When aligned with existing initiatives on cleanliness, discipline, and healthy living, nutrition literacy becomes a reinforcing layer of the school culture rather than a separate programmatic requirement.

Analytically, this strategic direction positions MBG within a hybrid policy domain bridging public health and education. The program does not require radical redefinition but should be recognized as possessing inherent pedagogical potential. By strengthening dissemination processes, clarifying implementation orientation, and providing minimal operational support, MBG can achieve broader and more sustainable educational impact without expanding bureaucratic structures. This approach allows the program to maintain a balance between effectiveness and institutional feasibility while preserving the organic dynamics through which nutrition literacy practices emerge within everyday school interactions.

3.7. Limitations and Future Research

This research contributes conceptually by positioning the MBG program as a pedagogical space at the school level, where program strengthening operates through nutrition literacy embedded in everyday school practices. In this study, “program strengthening” is understood as the process by which the MBG program moves beyond food provision to cultivate students’ nutritional awareness and habits through relational mechanisms—such as teacher guidance during meals, peer interaction, and routine eating practices that serve as informal learning processes. Through these mechanisms, nutrition literacy is not transmitted solely through formal instruction but is gradually constructed through repeated social practices within the school environment.

However, the research has several limitations: (1) the study is confined to a single school context, making its findings more analytical than statistically generalizable; (2) the data is based on interviews and observations, meaning that changes in nutritional behavior have not been measured over time or quantitatively; and (3) the accessibility and utilization of nutrition education tools have not been systematically evaluated, resulting in findings that are more descriptive of how practices function rather than the extent of tool usage.

Future research directions could be pursued through: (1) Comparative studies across schools to map variations in the mechanisms and relationships between tool availability and utilization; (2) Mixed methods studies that combine qualitative data on practices with quantitative measurements of behavior change and nutrition literacy indicators; (3) Longitudinal research to track the sustainability of the MBG impact; and (4) Exploring strategies for disseminating and aligning nutrition literacy with mealtime routines and school habits without eliminating the flexibility of practice.

4. Conclusion

This study confirms that the Free Nutritional Meal program (MBG) at the school level functions not only as a nutritional intervention but also as an implicit pedagogical space where nutrition literacy develops through everyday practices such as social interactions, consumption experiences, and situational dialogue. Although nutrition education guidelines and modules provide an important normative framework at the

policy level, the findings indicate that the strengthening of MBG is largely determined by how these tools are recognized, accessed, and operationalized within teacher-student relational practices and the daily culture of schools. In this context, nutrition literacy emerges through habituation, social participation, and collective mealtime routines, with varying levels of manifestation across classes and actors. These variations illustrate how everyday school practices serve as mechanisms through which the MBG program gains pedagogical meaning and sustained influence on students' nutritional awareness and habits.

Theoretically, this study contributes to the literature on school-level mechanisms and policy enactment by demonstrating that the effectiveness of a public nutrition program is shaped not solely by policy design, but by how policy is interpreted and activated through recurring micro-practices within educational settings. By positioning nutrition literacy as an emergent mechanism rather than a purely instructional outcome, the study extends existing discussion on nutrition literacy and situated learning in schools. It shows that literacy practices may develop through experiential engagement, peer interaction, and routine participation, thereby linking policy enactment processes with the everyday pedagogical ecology of schools.

From a policy perspective, the findings suggest that strengthening MBG does not require major policy reconstruction but rather a sharper orientation toward implementation practices at the school level. Greater impact can be achieved by reinforcing guideline dissemination, providing simple micro-implementation supports for teachers, and aligning program routines with existing school cultures. In this configuration, schools function not merely as points of program distribution but as active nodes where policy is interpreted, translated, and stabilized through everyday practices. Strengthening these relational and practical dimensions allows MBG to operate simultaneously as a public health intervention and an educational process that gradually institutionalizes healthier consumption norms among students.

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