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# School Meal Programs and Educational Outcomes: A Literature Synthesis of Mechanisms, Determinants, and Implications for Indonesia's Free Nutritious Meals Program

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***Keyword:***
*School meal program; Free Nutritious Meals Program; Educational outcomes; policy implementation.*

**Abstract:** School meal programs are cross-sector public interventions intended to improve nutrition and support educational participation and learning. This study synthesizes evidence on their effects on educational outcomes and identifies conditions shaping effectiveness, with implications for Indonesia's Free Nutritious Meals Program (MBG). A narrative literature review examined journal articles, international reports, meta-analyses, and academic publications concerning school meals, school participation, attention, concentration, cognitive performance, engagement, motivation, and academic achievement. Relevant sources were identified, selected, classified, and analyzed thematically. The synthesis indicates that school meal programs generally improve enrollment, attendance, retention, learning readiness, attention, concentration, classroom engagement, and, under supportive conditions, cognitive and academic outcomes. Effects vary according to nutritional quality, implementation consistency, program duration, student vulnerability, school environment, family support, socioeconomic context, and governance capacity. The evidence supports a sequential mechanism: improved nutritional intake reduces hunger, strengthens learning readiness, improves participation and classroom processes, and may contribute gradually to academic achievement. Accordingly, MBG evaluation should combine administrative delivery indicators with measures of implementation quality, educational participation, learning processes, and longer-term outcomes. The study offers a conceptual framework for cross-sector policy implementation and evaluation in education and nutrition

## INTRODUCTION

School meal programs are a form of public policy intervention that integrates objectives related to education, health, nutrition, social protection, and human resource development. In many countries, these programs have evolved from efforts merely to address hunger at school into strategic instruments for expanding access to education, improving the quality of learning, and reducing social inequalities among school-age children (Bundy et al., 2018). By providing nutritious meals during school hours, governments seek to create conditions that enable students to participate in learning more optimally.

Globally, school meal programs are among the largest social protection programs, reaching hundreds of millions of children every day. International organizations regard these programs as long-term investments in human capital development because they not only improve nutritional status but may also support cognitive development, school participation, and student learning outcomes ((FAO) et al., 2023; Bundy et al., 2018). In addition to benefiting students, school meal programs can strengthen household food security, support local agriculture, and improve community welfare through sustainable food supply chains.

The relationship between school meal programs and education is based on the assumption that adequate nutrition is an important prerequisite for effective learning. Children who attend class while hungry tend to experience lower attention, concentration, and endurance during learning activities than children who receive adequate food intake. Therefore, the provision of

meals at school is expected to create a more conducive learning environment in which students can participate more actively in the learning process (Adelman et al., 2008; Jukes et al., 2008).

Nevertheless, empirical evidence on the effects of school meal programs on educational outcomes remains mixed. A meta-analysis by Wang (Wang et al., 2021) found that school meal programs have positive effects on several educational indicators, particularly student attendance. However, effects on academic achievement and cognitive performance vary according to program characteristics, intervention duration, food quality, and the socioeconomic context in which the program is implemented. These findings indicate that the success of school meal programs cannot be assessed through a single educational indicator but should be understood as a process involving multiple dimensions of student development.

Similarly, evidence on universal free school meal policies is not entirely consistent. Cohen (Cohen et al., 2021) reported that nearly all studies found increased student participation in school meal programs after universal policies were introduced. However, evidence regarding effects on attendance, academic achievement, diet quality, and other educational indicators still varies across studies. These differences indicate that greater access to food does not necessarily translate directly into improvements across all educational outcomes.

Studies focusing on Sub-Saharan African countries show a similar pattern. School meal programs are generally positively associated with increased enrollment, attendance, and several indicators of academic performance. However, the magnitude of these effects differs according to program type, student characteristics, implementation quality, and the socioeconomic conditions of the implementation area. Thus, program effectiveness is determined not only by the availability of food at school, but also by how the program is designed and implemented within the local context.

The diversity of these findings demonstrates the multidimensional nature of educational outcomes associated with school meal programs. School attendance, attention, concentration, learning engagement, motivation, cognitive performance, and academic achievement are interrelated indicators, yet they should not be treated as identical constructs. Much of the previous literature has tended to focus on only one or two indicators, providing an incomplete picture of the relationships among educational outcomes. This creates a need for a review that integrates diverse empirical findings to develop a more comprehensive understanding of how school meal programs contribute to the educational process.

In Indonesia, discussion of the educational effects of the Free Nutritious Meals Program (MBG) is increasingly important. As a national program intended to improve the quality of human resources, MBG is expected not only to improve students' nutritional status but also to support better learning quality and educational outcomes. To date, however, studies that specifically integrate scientific evidence on the relationship between school meal programs and multiple educational outcomes remain relatively limited. Therefore, this literature review critically examines findings on the effects of school meal programs on educational outcomes, identifies factors that shape program effectiveness, and formulates implications that can inform the development and evaluation of Indonesia's MBG program.

## RESEARCH METHODS

This study employs a narrative literature review approach to identify, examine, compare, and synthesize scientific findings on the effects of school meal programs on educational outcomes. Unlike a systematic literature review, which follows highly structured selection and reporting protocols, a narrative literature review allows researchers greater flexibility to integrate relevant findings in order to explain the development of knowledge, identify patterns across studies, and formulate conceptual implications and future research agendas (Ferrari, 2015; Grant & Booth, 2009; Snyder, 2019)

The literature used in this review was drawn from reputable scientific publications addressing the relationship between school meal programs and various educational outcomes. References were searched through international databases, including Scopus, Web of Science, PubMed, ScienceDirect, SpringerLink, Taylor & Francis, Wiley Online Library, and Google Scholar, to identify relevant and frequently cited studies in education, public health, and public policy.

Search combinations included the keywords school meal program, school feeding, school breakfast program, universal school meals, educational outcomes, academic achievement, school attendance, student engagement, learning motivation, learning readiness, attention, concentration, and cognitive performance.

Sources were selected according to several considerations. First, articles had to be directly related to the implementation of school meal programs or food provision programs for students. Second, articles had to examine at least one educational outcome, such as school attendance, retention, attention, concentration, learning behavior, student engagement, learning motivation, cognitive performance, or academic achievement. Third, priority was given to publications in reputable international journals, review articles, meta-analyses, and reports from highly credible international organizations. To maintain the currency of the review, most references were published within the past fifteen years, although several classic publications were retained because they provide important conceptual foundations.

The analysis was conducted through narrative synthesis by comparing findings across studies, identifying similarities and differences, and grouping the literature into major themes according to the educational outcomes examined. This approach enables the authors not only to summarize previous findings but also to interpret relationships across studies, explain factors affecting program effectiveness, and identify research gaps that require further attention. Accordingly, this article does not seek to produce quantitative effect estimates as in a meta-analysis; rather, it provides a comprehensive conceptual understanding of how school meal programs contribute to various educational outcomes and the implications for implementing Indonesia's Free Nutritious Meals Program (Snyder, 2019).

## RESULTS AND DISCUSSION

### Characteristics of the Reviewed Literature

A review of the publications shows that research on school meal programs has developed rapidly over the past two decades. Earlier studies focused primarily on public health concerns, particularly reducing hunger and malnutrition and improving the health status of school-age children. As the human development paradigm evolved, research attention increasingly shifted toward the contribution of school meal programs to educational outcomes, including school attendance, attention during learning, cognitive performance, learning motivation, and academic achievement (Bundy et al., 2018; Kristjansson et al., 2007).

This shift in focus indicates that school meal programs are no longer understood merely as food assistance, but as part of public policy supporting sustainable human development. International organizations such as FAO, the World Food Programme (WFP), UNICEF, and the School Meals Coalition view school meal programs as social investments capable of generating cross-sector benefits, ranging from improved health, education, and social protection to stronger local economies through the use of domestically produced agricultural products ((FAO) et al., 2023; Bundy et al., 2018).

The literature analyzed in this review covers diverse regions of the world, including the United States, Canada, Australia, the United Kingdom, Denmark, Norway, India, Ethiopia, Kenya, Nigeria, Ghana, Brazil, and several other developing countries. Differences in regional characteristics have produced variation in school meal program designs, including school breakfast programs, school lunch programs, school feeding programmes, and universal free school meals. Such variation is one factor explaining differences in research findings on educational outcomes (Cohen et al., 2021; Spill et al., 2024).

Methodologically, most studies use quantitative approaches, including observational designs, quasi-experiments, randomized controlled trials, and longitudinal studies. Some studies also use qualitative approaches to explore the perceptions of students, teachers, parents, and school managers regarding the implementation of school meal programs. In recent years, systematic reviews and meta-analyses have increasingly been used to synthesize empirical evidence across countries, producing a more comprehensive understanding of program effectiveness (Kristjansson et al., 2007; Wang et al., 2021).

**Table I. Characteristics of the Reviewed Literature**

| Aspect | Synthesis Result |
|---|---|
| Publication period | Predominantly publications from 2007–2024 |
| Study regions | United States, Europe, Australia, Africa, Asia |
| Program types | School Breakfast Program, School Lunch Program, School Feeding Programme, Universal School Meals |
| Research methods | Observational, quasi-experimental, RCT, longitudinal, systematic review, meta-analysis |
| Main focus | Nutrition, educational participation, cognitive performance, learning motivation, academic achievement |

Developments in research methodology also reflect a shift in the evaluation paradigm for school meal programs. Earlier studies generally used easily observed indicators such as attendance rates and nutritional status. More recent research has introduced more complex indicators, including attention during learning, student engagement, learning motivation, self-regulation, and students' psychological well-being (Martin et al., 2024; Moller et al., 2021). This shift suggests that the benefits of school meal programs are increasingly understood as a process involving multiple dimensions of student development rather than simply improvements in academic achievement.

Even so, research findings continue to show substantial variation. Some studies identify strong associations between school meal programs and improved educational outcomes, whereas others report relatively small or statistically insignificant effects (Spill et al., 2024; Wang et al., 2021). These differences should not necessarily be viewed as contradictions; rather, they reflect the complexity of program implementation, which is shaped by food quality, intervention duration, student characteristics, socioeconomic conditions, and the capacity of implementing institutions.

These findings indicate that the effectiveness of school meal programs cannot be explained by a single indicator or a single discipline. A nutritional perspective explains how food affects students' physiological conditions, while an educational perspective explains changes in learning behavior and academic outcomes. A public administration perspective, meanwhile, provides insight into how governance, interorganizational coordination, organizational capacity, and implementation quality determine whether programs successfully generate public benefits (Hill & Hupe, 2022; Osborne, 2021).

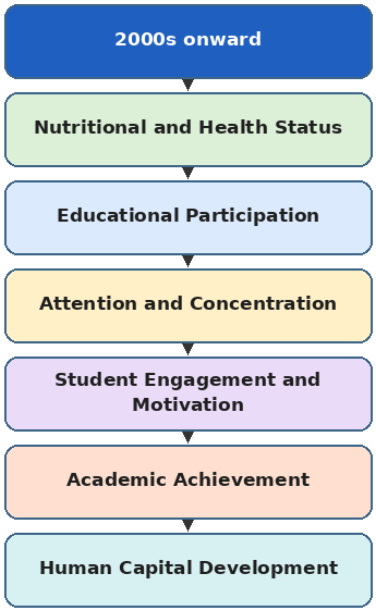



Figure 1. Evolution of Research Focus on School Meal Programs

*Source: Authors' synthesis based on the reviewed literature.*

The synthesis shows that research on school meal programs has evolved from an approach oriented toward health outputs to a more comprehensive perspective that positions school meal programs as an instrument of human capital development. Evaluating program effectiveness therefore can no longer rely only on nutritional status or the number of beneficiaries; it must also consider how the program influences learning processes and educational outcomes over time. This synthesis provides the foundation for examining the relationship between school meal programs and specific educational outcomes in the following sections.

**School Meal Programs and Educational Participation**

One of the most consistent findings in the literature is that school meal programs contribute to increased educational participation. Compared with other educational outcomes, such as cognitive performance or academic achievement, effects on educational participation are relatively easier to observe because they are reflected in increased school enrollment, attendance, and retention, as well as reduced dropout rates. Studies in both developed and developing countries indicate that food provision at school can reduce economic and social barriers that limit students' access to education (Bundy et al., 2018; Kristjansson et al., 2007; Wang et al., 2021).

The synthesis indicates two main pathways through which school meal programs increase educational participation. The first is an economic pathway: providing meals at school reduces household expenditures. For low-income families, school meals reduce the cost of children's daily food consumption, increasing parents' incentives to enroll their children and keep them in school. The second is a physiological pathway: reduced hunger allows students to participate more fully in learning activities throughout the school day. These pathways complement one another and help explain why improved educational participation is among the most consistent findings across studies (Adelman et al., 2008; Bundy et al., 2018; Wall et al., 2022).

The consistency of these findings is evident across different implementation contexts. In Sub-Saharan Africa, school meal programs are generally associated with higher new-student enrollment and lower absenteeism, particularly in food-insecure areas. In high-income countries such as the United States and the United Kingdom, benefits are more often reflected in increased participation in school meal services and sustained school attendance, although effects on academic indicators remain variable (Cohen et al., 2021; Spill et al., 2024; Wall et al., 2022).These

findings demonstrate that despite differences in socioeconomic context, school meal programs continue to play an important role in sustaining educational participation.

**Table II. Synthesis of Findings on the Effects of School Meal Programs on Educational Participation**

| Educational Outcome | Overall Trend in Findings | Key References |
|---|---|---|
| School enrollment | School meal programs contribute to higher enrollment, particularly in areas with high levels of food insecurity and poverty. | Bundy et al. (2018); Wall et al. (2022) |
| School attendance | Most studies identify improved student attendance as the most consistent effect of school meal program implementation. | Kristjansson et al. (2007); Wang et al. (2021) |
| School retention | School meal programs help students remain enrolled, particularly among vulnerable groups and low-income families. | Adelman et al. (2008); Wall et al. (2022) |
| Dropout | School meal program implementation tends to be associated with lower dropout rates by supporting sustained educational participation. | Bundy et al. (2018); Wang et al. (2021) |

Although most studies report positive associations, the magnitude of the effect on educational participation is not uniform. The literature indicates that program effectiveness is influenced by regional characteristics, poverty levels, implementation quality, and the sustainability of program funding. In areas with high food insecurity, program effects tend to be greater than in areas where food access is already relatively adequate. This indicates that the benefits of school meal programs are strongly shaped by the context in which the policy is implemented (Aurino et al., 2020; Wall et al., 2022).

Furthermore, several studies emphasize that improved educational participation is an early educational outcome that provides the foundation for later outcomes. Better attendance increases students' opportunities to participate fully in the learning process. In other words, increased attendance does not automatically result in higher academic achievement, but it is an important prerequisite for learning to occur effectively (Jukes et al., 2008; Wang et al., 2021).

From a public administration perspective, these findings show that school meal programs serve functions beyond the provision of food services. They operate as policy instruments that can strengthen public access to education by reducing economic barriers and supporting sustained school participation. Accordingly, indicators of educational participation, including attendance, retention, and dropout rates, should be considered key indicators in evaluating the implementation of Indonesia's Free Nutritious Meals Program (MBG), because they are more sensitive to early policy effects than academic achievement, which generally requires a longer period to change.

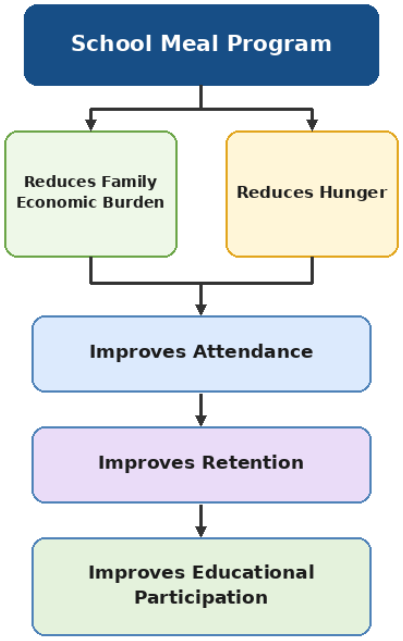



Figure 2. Mechanisms Linking School Meal Programs to Educational Participation

*Source: Authors' synthesis based on the reviewed literature.*

The synthesis of multiple studies indicates that the effect of school meal programs on educational participation is among the strongest and most consistent findings in the literature. This suggests that the principal benefit of the program in the early stages of implementation is not an immediate increase in academic scores, but rather the creation of conditions that enable students to attend school, remain enrolled, and participate in learning more consistently. The finding also reinforces the importance of evaluating education policy through changes in participation behavior as a foundation for improving the quality of learning at subsequent stages.

**School Meal Programs, Attention, Concentration, and Cognitive Performance**

In addition to increasing educational participation, the literature indicates that school meal programs contribute to the quality of the learning process by improving attention, concentration, and cognitive performance. Unlike participation indicators that can be observed directly through school administrative data, these three indicators reflect internal processes that influence students' ability to receive, process, and understand learning materials. Attention, concentration, and cognitive performance are therefore often positioned as intermediate educational outcomes linking adequate nutrition to improved learning outcomes (Jukes et al., 2008; Wang et al., 2021).

The synthesis shows that adequate energy intake before or during learning contributes to improved readiness to participate in educational activities. Students who receive sufficient food intake tend to sustain attention for longer periods, demonstrate better concentration, and experience fewer learning disruptions caused by hunger. These conditions create a more conducive learning environment and increase students' opportunities to understand material presented by teachers (Kristjansson et al., 2007; Sørensen et al., 2015; Wang et al., 2021).

However, effects on cognitive functioning are not consistently observed. Some studies report significant improvements in attention, working memory, and executive function after students receive school meals, whereas others find relatively small changes. These differences indicate that cognitive performance is influenced not only by nutritional adequacy, but also by students' age, health status, teaching quality, and the characteristics of the school environment. School meals are therefore one factor supporting learning, rather than the sole determinant of students' cognitive performance (Kristjansson et al., 2007; Wang et al., 2021).

Differences in study results are also related to variation in the instruments used to measure cognitive performance. Some studies use attention tests, others use memory tests, and still others

measure executive function or problem-solving ability. This diversity of indicators means that findings are not always directly comparable across studies. Moreover, many studies evaluate program effects over relatively short periods, meaning that cumulative changes in cognitive performance may not yet be fully observable (Jukes et al., 2008).

**Table III. Synthesis of Findings on Attention, Concentration, and Cognitive Performance**

| Aspect Examined | Overall Trend in Findings | Key References |
|---|---|---|
| Attention during learning | Most studies show that school meal programs improve students' attention during learning, particularly by reducing learning disruptions caused by hunger. | Kristjansson et al. (2007); Sørensen et al. (2015) |
| Concentration | School meal programs tend to improve students' ability to sustain concentration, particularly among students who previously experienced inadequate energy intake or hunger during lessons. | Wang et al. (2021); Jukes et al. (2008) |
| Working memory and executive function | Findings remain variable. Effects on working memory and executive function depend on intervention type, program duration, student characteristics, and the measurement instruments used. | Wang et al. (2021) |
| Overall cognitive performance | Overall, research suggests a positive tendency in cognitive performance, although the magnitude of the effect is not fully consistent because of contextual and methodological factors. | Kristjansson et al. (2007); Wang et al. (2021) |

These findings suggest that attention and concentration are more responsive indicators of school meal programs than overall cognitive performance. This is understandable because attention and concentration are directly related to students' physiological condition during learning, whereas cognitive performance develops through more complex processes and is influenced by other factors, including teaching quality, learning stimulation at home, and prior learning experiences (Jukes et al., 2008).

From a learning perspective, attention and concentration function as prerequisites for an effective learning process. Students who can maintain focus on instructional material are more likely to understand information, complete tasks, and participate actively in classroom activities. Improvements in attention and concentration can therefore be viewed as an initial mechanism bridging adequate nutrition and improved learning quality.

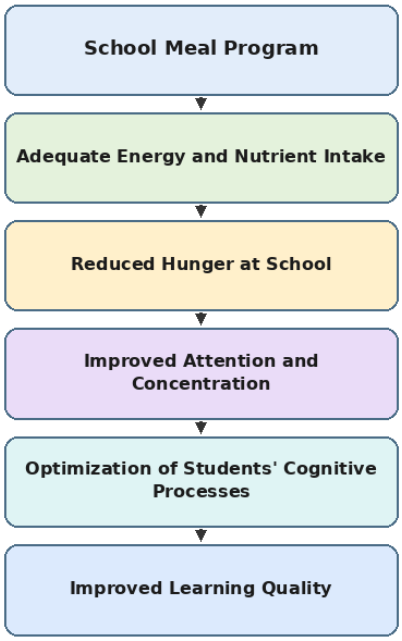



Figure 3. Position of Attention, Concentration, and Cognitive Performance in the Learning Process

*Source: Authors' synthesis based on the reviewed literature.*

The synthesis indicates that the contribution of school meal programs to learning is more clearly reflected in improvements in attention and concentration than in overall cognitive performance. This suggests that the educational benefits of school meal programs develop gradually. Physiological improvements resulting from adequate nutrition first increase learning readiness, then improve the quality of the learning process, and only later contribute to academic outcomes over a longer period. Attention and concentration can therefore be positioned as important indicators for evaluating the effectiveness of both school meal programs and Indonesia's Free Nutritious Meals Program (MBG).

**School Meal Programs, Engagement, and Learning Motivation**

Learning motivation is an educational outcome receiving increasing attention in research on school meal programs. Unlike school attendance or academic achievement, which can be measured relatively easily through administrative data or learning assessments, learning motivation is a psychological construct reflecting students' internal drive to engage, persist, and work toward learning goals. Consequently, research on the relationship between school meal programs and learning motivation remains less extensive than research on nutritional status, school attendance, or academic achievement (Martin et al., 2024; Moller et al., 2021).

The synthesis shows that most studies do not measure learning motivation directly, but instead assess indicators representing the process through which motivation develops, such as learning readiness, attention during instruction, engagement in classroom activities, participation in discussions, persistence in completing tasks, and interaction with teachers and peers. These findings suggest that the benefits of school meal programs for learning motivation operate more through improvements in the quality of learning processes than through direct increases in motivation (Jukes et al., 2008; Martin et al., 2024).

The literature consistently shows that students whose nutritional needs are met during the school day tend to demonstrate greater learning engagement. This engagement is reflected in stronger attention to learning materials, more active participation in discussions, better ability to maintain focus, and greater willingness to complete academic tasks. These patterns indicate that meeting physiological needs provides a foundation that enables students to participate more fully in learning (Illøkken et al., 2021; Moller et al., 2021).

Conversely, studies also show that students who experience hunger during school hours are more vulnerable to reduced attention, fatigue, impaired concentration, and lower engagement in learning activities. As a result, their opportunities to obtain meaningful learning experiences are reduced. At this stage, therefore, the main benefit of school meal programs is not simply to increase learning motivation, but to create learning conditions in which motivation can develop through more positive educational experiences (Jukes et al., 2008; Martin et al., 2024).

These findings indicate that the relationship between school meal programs and learning motivation is indirect. Learning motivation develops through a sequence beginning with adequate nutrition, followed by improved learning readiness, stronger attention and concentration, and greater student engagement in learning. Increased motivation therefore cannot be expected from food provision alone; it also requires a conducive learning environment, good teaching quality, and positive interaction between teachers and students.

**Table IV. Literature Synthesis on the Effects of School Meal Programs on Student Engagement and Learning Motivation**

| Aspect | Synthesis Finding | Key References |
|---|---|---|
| Learning readiness | Meeting nutritional needs through school meal programs tends to improve students' readiness to learn, reflected in better physical condition and fewer learning disruptions caused by hunger. | Jukes et al. (2008); Martin et al. (2024) |
| Student engagement | Most studies show that school meal programs contribute to greater student engagement through improved attention, classroom participation, and more active interaction during learning. | Moller et al. (2021); Illøkken et al. (2021) |
| Learning motivation | Direct empirical evidence on learning motivation remains limited. However, studies indicate an indirect positive relationship through improvements in learning readiness, attention, and student engagement. | Martin et al. (2024); Wang et al. (2021) |
| Learning behavior | School meal programs tend to be associated with greater persistence, academic participation, discipline in attending lessons, and engagement in classroom learning activities. | Illøkken et al. (2021); Barnabas et al. (2024) |

The synthesis also indicates that learning motivation cannot be separated from the quality of students' learning experiences at school. School meal programs function as one supporting factor in creating more conducive learning conditions, but success in increasing motivation remains influenced by teaching quality, school climate, teacher-student relationships, and family support. School meal programs are therefore better understood as part of an educational ecosystem that supports the development of learning motivation rather than as interventions that directly produce motivational change.

These findings have important implications for the evaluation of Indonesia's Free Nutritious Meals Program (MBG). Program success has often been assessed primarily through food distribution, compliance with nutritional standards, or the number of beneficiaries. Based on the literature synthesis, MBG evaluation should also incorporate learning-process indicators such as learning readiness, student engagement, attention during instruction, and learning motivation. These indicators would provide a more comprehensive picture of the program's contribution to improving educational quality.

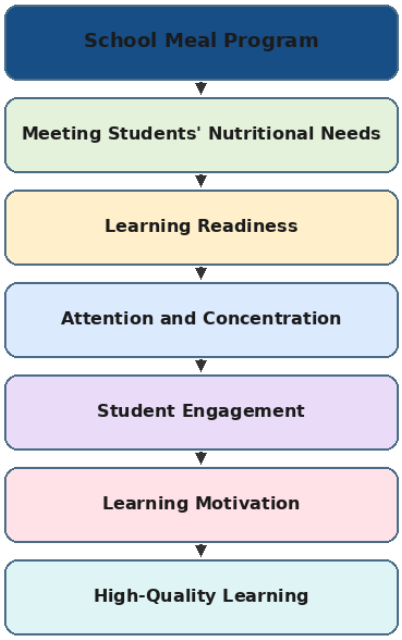



Figure 4. Mechanism Through Which School Meal Programs Support Learning Motivation

*Source: Authors' synthesis based on the reviewed literature.*

The literature synthesis suggests that learning motivation is an educational outcome that develops through a gradual process. School meal programs contribute by creating conditions that support students' readiness and engagement in learning. Increased learning motivation is therefore better understood as the result of interaction among adequate nutrition, implementation quality, and a supportive learning environment rather than as a direct consequence of providing food at school.

**School Meal Programs and Academic Achievement**

Academic achievement is among the most frequently used indicators for evaluating the effectiveness of school meal programs. Across studies, academic achievement is measured through examination grades, subject performance, standardized test scores, or academic achievement indices. Compared with educational participation or attention during learning, however, the relationship between school meal programs and academic achievement shows greater variability. This reflects the fact that academic achievement is influenced by multiple interacting factors, making the effects of school meal programs difficult to observe directly (Kristjansson et al., 2007; Wang et al., 2021).

The synthesis shows that most studies report a generally positive association between school meal programs and academic achievement. Students with access to nutritious meals at school tend to have a greater likelihood of achieving better learning outcomes than students without comparable interventions. However, the magnitude of the effect varies according to program characteristics, implementation quality, intervention duration, and students' socioeconomic conditions (Bundy et al., 2018; Spill et al., 2024).

These differences indicate that academic achievement is not a direct consequence of providing food at school. Research suggests that improvements in academic performance more often emerge after changes occur in learning-process indicators, including better attendance, improved attention and concentration, and increased engagement and learning motivation. In other words, school meal programs contribute to academic achievement through a sequence of gradual mechanisms rather than through a simple direct causal relationship (Jukes et al., 2008; Martin et al., 2024).

The literature also indicates that effects on academic achievement tend to be greater among students who previously experienced food insecurity or undernutrition. For these groups,

meeting daily energy needs produces more visible improvements in learning readiness and may therefore improve learning outcomes. By contrast, among students with relatively adequate nutritional status, additional food at school often produces no significant change in academic achievement. This shows that program effectiveness is strongly influenced by beneficiaries' baseline conditions (Aurino et al., 2020; Wang et al., 2021).

In addition to student characteristics, the quality of the learning process is an important determinant of whether the program improves academic achievement. Providing nutritious food does not automatically produce higher educational attainment when it is not accompanied by good teaching, adequate learning facilities, teacher competence, and a supportive learning environment. Accordingly, several studies emphasize that school meal programs should be positioned as part of an integrated strategy to improve educational quality rather than as stand-alone interventions (Bundy et al., 2018; Cohen et al., 2021).

**Table V. Synthesis of Findings on School Meal Programs and Academic Achievement**

| Aspect | Synthesis Result | Key References |
|---|---|---|
| Academic achievement | Most studies indicate that school meal programs contribute to improved academic achievement, although effect size varies according to student characteristics, implementation quality, and socioeconomic context. | Kristjansson et al. (2007); Wang et al. (2021) |
| Standardized test scores | Positive effects on standardized test scores are reported in some studies, especially where programs are implemented consistently; however, findings are not fully consistent across contexts. | Spill et al. (2024); Bundy et al. (2018) |
| Long-term impact | Effects on academic achievement tend to become more visible when school meal programs are implemented continuously over a longer period. Short-term implementation generally produces changes mainly in learning-process indicators. | Bundy et al. (2018); Aurino et al. (2020) |
| Factors influencing effectiveness | Effects on academic achievement are shaped by students' nutritional status, school learning quality, family socioeconomic conditions, and the quality of program implementation and governance. | Cohen et al. (2021); Wang et al. (2021) |

These findings show that academic achievement is the most complex indicator for evaluating the success of school meal programs. Unlike attendance or attention, which may change over a relatively short period, academic achievement is the accumulated result of learning experiences that develop continuously. Changes in academic outcomes therefore generally become observable only after a program has been implemented consistently for a sufficiently long period.

From an educational perspective, this pattern indicates that school meal programs operate through an indirect pathway. Programs improve students' physical readiness, strengthen the quality of the learning process, increase engagement and motivation, and gradually contribute to academic achievement. Academic performance should therefore not be used as the sole indicator of implementation success because it is influenced by many factors beyond the school meal intervention itself.

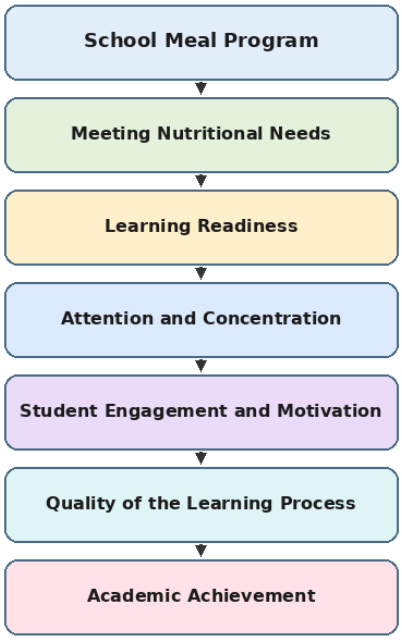



Figure 5. Pathway Linking School Meal Programs to Academic Achievement

*Source: Authors' synthesis based on the reviewed literature.*

The literature synthesis indicates that academic achievement is a final outcome of a sequence of changes occurring during the implementation of school meal programs. Policy evaluation should therefore not focus solely on changes in academic scores, but should also consider the process indicators that precede them. A comprehensive evaluation approach provides a more accurate picture of program effectiveness while helping policymakers identify implementation aspects that need to be strengthened in order to achieve sustainable human resource development goals.

**Factors Influencing the Effectiveness of School Meal Programs**

The synthesis of multiple studies indicates that the effectiveness of school meal programs is determined not only by whether a program exists, but also by the quality of implementation and the context in which it operates. Although most studies report positive effects on various educational outcomes, the magnitude of the effect differs across countries and schools. These differences demonstrate that program success results from interaction among multiple factors, including intervention quality, student characteristics, institutional capacity, and support from the social environment (Bundy et al., 2018; Wang et al., 2021).

One of the most important factors is the nutritional quality of the meals provided. The literature shows that educational benefits depend not only on food availability but also on energy, protein, vitamin, and mineral content, as well as food safety. Programs that consistently provide balanced nutritious meals tend to produce better outcomes than programs focused merely on the number of meals served. Menu variety, taste, and students' acceptance of the food also influence consumption levels and therefore the effectiveness of the intervention ((FAO) et al., 2023; Bundy et al., 2018)

A second factor is consistency of program implementation. Studies show that changes in educational outcomes require sustained implementation. Programs affected by distribution disruptions, delayed meal provision, or fluctuating menu quality tend to produce weaker effects than programs delivered routinely according to consistent service standards. This indicates that program success depends not only on policy design but also on the ability of implementing organizations to maintain implementation quality (Kristjansson et al., 2007; Wang et al., 2021).

Student characteristics are also important in determining the magnitude of program benefits. The literature shows that students from low-income families or areas with high food

insecurity tend to benefit more than students who already have access to nutritious food. Among vulnerable groups, school meal programs not only meet nutritional needs but also reduce families' economic burden, increasing children's opportunities to remain in school and participate optimally in learning (Adelman et al., 2008; Aurino et al., 2020).

Beyond individual factors, the school environment also plays a significant role. Schools with good management, supportive leadership, teacher involvement, and adequate facilities are generally better able to integrate school meal programs into the learning process. Under these conditions, school meals are not treated as an additional activity, but become part of an educational ecosystem that supports a healthy and conducive learning environment (Bundy et al., 2018; Cohen et al., 2021).

Governance and institutional coordination have also emerged as increasingly important themes in the literature. Implementing school meal programs involves multiple actors, including central and local governments, schools, food providers, health workers, and communities. Program effectiveness is therefore strongly influenced by clear divisions of responsibility, coordination mechanisms, supervision systems, and interorganizational accountability. From a public administration perspective, the quality of governance is a key prerequisite for successful implementation of public service policy (Hill & Hupe, 2022; Osborne, 2021).

**Table VI. Literature Synthesis on Factors Influencing the Effectiveness of School Meal Programs**

| Factor | Synthesis Result | Key References |
|---|---|---|
| Nutritional quality | Nutritional quality is a major determinant of program effectiveness. Energy, protein, micronutrient content, food safety, and menu variety contribute to learning readiness and the educational benefits received by students. | Bundy et al. (2018); FAO, WFP, & School Meals Coalition (2023) |
| Implementation consistency | Continuous and consistent implementation determines whether effects on educational outcomes can be sustained. Distribution disruptions and inconsistent delivery can reduce program effectiveness. | Kristjansson et al. (2007); Wang et al. (2021) |
| Student characteristics | Benefits depend on students' characteristics, particularly nutritional status, age, health condition, and socioeconomic background. Effects are generally greater among food-insecure students and those from low-income families. | Adelman et al. (2008); Aurino et al. (2020) |
| School environment | A supportive school environment, including school leadership, teacher involvement, learning facilities, and a positive school culture, strengthens integration between school meal programs and learning and therefore increases program effectiveness. | Cohen et al. (2021); Bundy et al. (2018) |
| Governance and coordination | Successful implementation depends on governance quality, cross-sector coordination, supervision systems, accountability, and the capacity of implementing organizations to manage the program effectively and sustainably. | Osborne (2021); Hill & Hupe (2022) |

The synthesis further shows that school meal program effectiveness depends on the interconnection among these factors. A program with high-quality meals may not produce optimal educational benefits if implementation is inconsistent or the school environment is not supportive. Conversely, schools with strong governance are better able to optimize program

benefits through effective coordination, adequate supervision, and active participation by teachers and communities.

These findings demonstrate that the success of school meal programs cannot be explained by a single variable. Program effectiveness results from interaction among intervention quality, the capacity of implementing organizations, beneficiary characteristics, and the social environment in which policy is implemented. Evaluation of school meal programs should therefore adopt a systemic approach capable of capturing the relationships among the factors that shape implementation success.

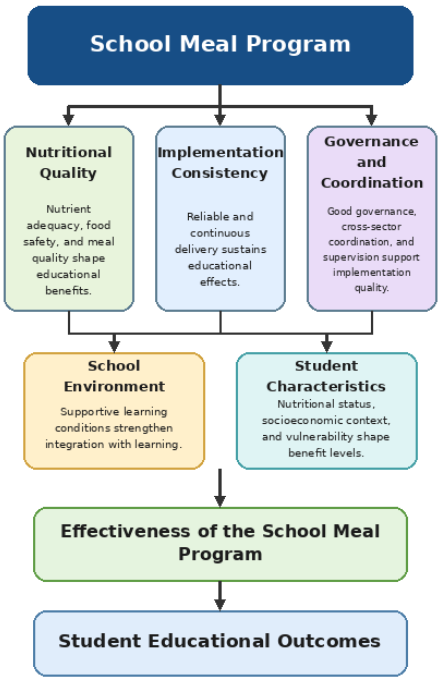



Figure 6. Model of Factors Influencing the Effectiveness of School Meal Programs

*Source: Authors' synthesis based on the reviewed literature.*

The literature synthesis indicates that the success of school meal programs results from synergy between policy quality and implementation quality. Improving effectiveness therefore requires more than refining nutritional standards or increasing budgets; it also requires stronger institutional capacity, cross-sector coordination, supervision systems, and participation by all stakeholders. This finding provides an important foundation for developing Indonesia's Free Nutritious Meals Program (MBG) so that it is oriented not only toward food distribution but also toward strengthening implementation governance as a central prerequisite for policy success.

**Literature Synthesis and Implications for the Free Nutritious Meals Program (MBG)**

The synthesis of the reviewed studies shows that the effects of school meal programs on educational outcomes are neither linear nor direct. Instead, educational benefits emerge through a sequence of interconnected mechanisms beginning with the fulfillment of students' nutritional needs and improved physiological condition, followed by stronger learning readiness, better attention and concentration, increased engagement in learning, and ultimately potential improvements in academic achievement. School meal programs are therefore better understood as interventions that strengthen the learning process rather than as policies that directly increase academic outcomes(Bundy et al., 2018; Jukes et al., 2008; Wang et al., 2021)

These findings show that the success of school meal programs is strongly influenced by the interconnection among individual factors, the school environment, and policy governance. Adequate nutrition provides the physiological foundation that enables students to participate optimally in learning, but these benefits can develop only when supported by high-quality program implementation, a conducive learning environment, competent teachers, and effective school management. The effectiveness of school meal programs therefore cannot be explained by

nutritional or educational perspectives in isolation; it requires a more integrative perspective linking health, education, and public administration.

From a public administration perspective, this synthesis reinforces the view that policy implementation is a determining factor in the success of public programs. Well-designed policies will not produce optimal benefits without adequate organizational capacity, cross-sector coordination, supervision mechanisms, and evaluation systems (Hill & Hupe, 2022; Osborne, 2021). Implementation quality thus serves as the key link between policy objectives and the benefits received by the public.

The findings of this literature review also have important implications for implementing Indonesia's Free Nutritious Meals Program (MBG). As a national program reaching millions of students, MBG success should not be measured solely by the number of beneficiaries or meals distributed. Program evaluation should also assess changes occurring during the learning process, including school attendance, attention, concentration, learning engagement, learning motivation, and academic achievement. Such an evaluation approach would provide a more comprehensive picture of the policy's effectiveness in supporting human resource development.

The literature further shows that program success is strongly influenced by governance quality. MBG implementation therefore requires strong coordination among the National Nutrition Agency, local governments, educational institutions, food providers, health workers, and communities. Stakeholder synergy is essential to maintain nutritional standards, food safety, timely distribution, and program sustainability. In this context, evaluation of MBG implementation should adopt a cross-sector approach that assesses not only health and educational aspects, but also the quality of policy governance.

**Table VII. Literature Synthesis and Implications for the Implementation of Indonesia's Free Nutritious Meals Program (MBG)**

| Literature Synthesis Finding | Implications for the Free Nutritious Meals Program (MBG) |
|---|---|
| School meal programs consistently contribute to educational participation, particularly through improved attendance, retention, and sustained school participation. | MBG evaluation should include educational participation indicators such as attendance, retention, and continued schooling as early measures of successful implementation. |
| Attention, concentration, and student engagement are intermediate outcomes that play an important role in shaping the quality of the learning process. | The MBG evaluation system should measure learning-process indicators such as attention, concentration, student engagement, and learning motivation rather than focusing only on academic outcomes. |
| Academic achievement is a final educational outcome influenced by many factors, including learning quality, socioeconomic conditions, and student characteristics. | MBG implementation should be integrated with efforts to improve teaching quality, strengthen teacher capacity, and provide a conducive learning environment so that potential academic benefits can be optimized. |
| School meal program effectiveness is strongly influenced by implementation quality, governance, interorganizational coordination, and monitoring and evaluation systems. | Strengthening governance, cross-sector coordination, supervision mechanisms, and performance-based monitoring and evaluation should be a priority to ensure effective and sustainable MBG implementation. |
| School meal programs are long-term investments in human resource development that integrate education, health, and social protection. | MBG should be positioned as a strategic national policy supporting sustainable human resource development through synergy among education, health, nutrition, and public administration policies. |

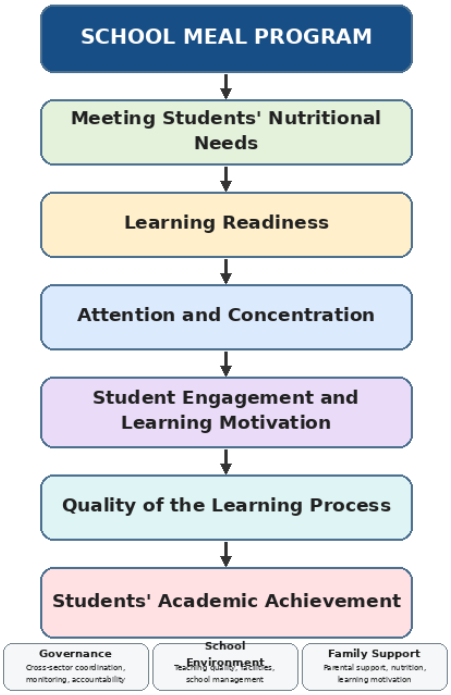



Figure 7. Conceptual Model Derived from the Literature Synthesis

*Source: Authors' synthesis based on the reviewed literature.*

The conceptual model generated from this literature synthesis shows that the effectiveness of school meal programs is not determined by a single factor, but by interaction among the quality of nutritional intervention, the learning process, and the quality of policy implementation. The model broadens understanding of the relationship between school meal programs and educational outcomes by positioning policy implementation as a factor shaping the success of the entire change process. The article therefore contributes conceptually to public administration scholarship while offering an analytical framework that can be used to evaluate the implementation of Indonesia's Free Nutritious Meals Program.

## CONCLUSSION

This literature review confirms that school meal programs should be understood as public policies with a strategic role in human resource development. Their contribution lies not only in providing nutritious food to students, but also in their capacity to build a more conducive learning ecosystem through the integration of health, education, and public governance. Program effectiveness therefore cannot be assessed partially; it should be understood as the result of interactions among intervention quality, implementation capacity, and the educational environment.

This article contributes conceptually by synthesizing the literature in a way that positions educational outcomes as an interconnected sequence of processes. This perspective broadens the evaluation of school meal programs from an approach focused primarily on final outcomes to one that also considers the quality of implementation and learning processes. In doing so, the review enriches the public administration literature, particularly scholarship on policy implementation and the evaluation of cross-sector public services.

In the Indonesian context, this synthesis provides an academic basis for developing a more comprehensive evaluation framework for the Free Nutritious Meals Program (MBG). Policy evaluation should not only assess the achievement of administrative targets, but also capture the extent to which program implementation supports a high-quality learning environment as part of sustainable investment in human resource development.

The government should develop an evaluation system for the Free Nutritious Meals Program (MBG) that integrates indicators of governance, implementation quality, and educational

outcomes within a comprehensive framework. Such an approach is expected to generate more accurate information as a basis for policy improvement and for enhancing the quality of public services in education and nutrition.

For program implementers, stronger interorganizational coordination, standardized service quality, greater implementation capacity, and continuous monitoring and evaluation should be prioritized to ensure consistent program delivery across regions. The involvement of schools, parents, health workers, and communities should also be strengthened to support program sustainability and improve accountability.

For the advancement of knowledge, future research should assess not only the effects of school meal programs on educational indicators, but also policy implementation, collaborative governance, public service quality, and public trust in program administrators. Multidisciplinary approaches and longitudinal or mixed-methods research designs would provide a more comprehensive understanding of the mechanisms underlying program success and generate stronger evidence-based recommendations for future public policy development.

## REFERENCES

(FAO), F. and A. O. of the U. N., (WFP), W. F. P., & Coalition, S. M. (2023). *School Meals Coalition annual report 2023*. FAO.

Adelman, S., Gilligan, D. O., & Lehrer, K. (2008). *How effective are food for education programs? A critical assessment of the evidence from developing countries*. International Food Policy Research Institute.

Aurino, E., Tranchant, J. P., Diallo, A. S., & Gelli, A. (2020). School feeding or general food distribution? Quasi-experimental evidence on the educational impacts of emergency food assistance during conflict in Mali. *Journal of Development Studies*, *56*(5), 945–968.

Bundy, D. A. P., Silva, N., Horton, S., Jamison, D. T., & Patton, G. C. (Eds.). (2018). *Disease control priorities (3rd ed., Vol. 8): Child and adolescent health and development* (3rd ed., Vol. 8). World Bank.

Cohen, J. F. W., Hecht, A. A., McLoughlin, G. M., Turner, L., & Schwartz, M. B. (2021). Universal school meals and associations with student participation, attendance, academic performance, diet quality, food security, and body mass index: A systematic review. *Nutrients*, *13*(3), 911.

Ferrari, R. (2015). Writing narrative style literature reviews. *Medical Writing*, *24*(4), 230–235.

Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal*, *26*(2), 91–108.

Hill, M., & Hupe, P. (2022). *Implementing public policy: An introduction to the study of operational governance* (4th ed.). SAGE Publications.

Illøkken, K. E., Bere, E., & Øverby, N. C. (2021). Free school meals and student participation, social interaction, and learning experiences: A qualitative study. *International Journal of Environmental Research and Public Health*, *18*(15), 8031.

Jukes, M. C. H., Drake, L. J., & Bundy, D. A. P. (2008). *School health, nutrition and education for all: Levelling the playing field*. CABI.

Kristjansson, E., Robinson, V., Petticrew, M., MacDonald, B., Krasevec, J., Janzen, L., Greenhalgh, T., Wells, G., MacGowan, J., Farmer, A., Shea, B. J., Mayhew, A., & Tugwell, P. (2007). School feeding for improving the physical and psychosocial health of disadvantaged elementary school children. *Cochrane Database of Systematic Reviews*, *1*, CD004676.

Martin, J., Smith, K., & Brown, R. (2024). School meal programmes, learning motivation and educational engagement: A review of recent evidence. *International Journal of Educational Research*, *126*, 102412.

Moller, A. C., Rowland, B., & Ryan, R. M. (2021). Student engagement and educational outcomes: A self-determination theory perspective. *Educational Psychologist*, *56*(3), 150–172.

Osborne, S. P. (2021). *Public service logic: Creating value for public service users, citizens, and society*. Routledge.

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, *104*, 333–339.

Sørensen, K., Hansen, B., & Pedersen, S. (2015). School breakfast, attention and classroom behaviour among primary school children. *Public Health Nutrition*, *18*(15), 2765–2773.

Spill, M. K., Smith, K. T., & Cunningham-Sabo, L. (2024). School meal participation and academic outcomes: An updated evidence review. *Nutrition Reviews*, *82*(2), 145–162.

Wall, C., Neelon, B., & Ammerman, A. (2022). School feeding programmes and educational participation: A global evidence review. *International Journal of Educational Development*, *90*, 102561.

Wang, D., Stewart, D., Chang, C., & Shi, Y. (2021). Effect of school feeding programs on educational, nutritional, and health outcomes in low- and middle-income countries: A systematic review and meta-analysis. *Nutrients*, *13*(2), 589. https://doi.org/10.3390/nu13020589