

## **The Impact of Free Nutritious Meal Programs on Food Security: A Systematic Review**

**Yusriadi Yusriadi**

Universitas Cahaya Prima, South Sulawesi, Indonesia

### **Abstract**

Food security is a persistent global challenge, particularly in low-income communities where access to nutritious food is limited. Free nutritious meal programs have been introduced to enhance food access and improve nutritional intake, especially for vulnerable populations such as children and low-income families. Despite their implementation, their overall impact on food security at the household and community levels remains underexplored. This systematic review examines the role of free nutritious meal programs in improving food security by evaluating their effects on food availability, accessibility, utilization, and stability. The study also highlights economic, social, and policy-related challenges affecting program sustainability. A systematic literature review was conducted following PRISMA guidelines. Data were sourced from academic databases such as Scopus, Web of Science, and PubMed, focusing on studies published in the last decade. Thematic analysis was employed to identify trends related to program effectiveness, policy integration, and long-term sustainability. Findings indicate that free meal programs enhance food security by increasing access to nutritious food, reducing malnutrition, and improving educational and economic outcomes. However, challenges such as financial constraints, logistical barriers, and policy fragmentation limit long-term success. While free nutritious meal programs offer short-term relief for food insecurity, their sustainability depends on strong policy support, financial investment, and integration with local food systems. Further research should explore scalable models to ensure their long-term effectiveness in diverse socio-economic settings.

**Keywords:** food security, free meal programs, nutrition policy, systematic review, Indonesia

### **1. Introduction**

Food security continues to be a pressing global issue, affecting millions of people, particularly in economically disadvantaged regions (Dwiartama et al., 2022; Kahane et al., 2013; Yusriadi, Cahaya, et al., 2024). The Food and Agriculture Organization (FAO) defines food security as a condition in which individuals have consistent access to sufficient, safe, and nutritious food to support an active and healthy lifestyle. However, many communities, especially those in developing nations, struggle with food insecurity due to economic limitations, inadequate food distribution systems, and environmental challenges (Pinstrup-Andersen, 2009; Yusriadi & Cahaya, 2022). To address this issue, various initiatives have been implemented, one of which is the provision of free nutritious meal programs. These initiatives are designed to enhance food security by directly supplying nutritionally adequate meals, thereby improving dietary intake and overall health, especially among vulnerable populations such as children and low-income families (Mehraban & Ickowitz, 2021; Thorlakson & Neufeldt, 2012; Yusriadi, Sugiharti, et al., 2024).

Free meal programs have been widely adopted in multiple settings, including schools, community centers, and crisis-affected regions. In school-based feeding programs, for instance, the primary goal is to improve children's nutritional intake while simultaneously encouraging school attendance and enhancing cognitive performance. These programs have demonstrated positive short-term effects on health and education, but their long-term impact on food security remains a subject of debate. Challenges such as budgetary constraints, logistical inefficiencies, and gaps in policy implementation often hinder their effectiveness, raising concerns about their sustainability as a long-term solution for food security. Additionally, while these programs provide immediate relief, their ability to foster self-reliance and long-term dietary improvements in communities remains unclear.

This study aims to conduct a systematic review to evaluate the impact of free nutritious meal programs on food security. Specifically, it will assess how these programs contribute to different dimensions of food security, including food availability, accessibility, utilization, and stability. By synthesizing findings from existing literature, this review will provide a comprehensive understanding of the strengths and limitations of free meal programs. Moreover, the study will explore strategies to enhance the long-term sustainability of these initiatives, offering insights for policymakers, development agencies, and local communities. The ultimate goal is to determine whether these programs can serve as a viable and lasting intervention for improving food security, particularly in regions facing persistent nutritional challenges.

## **2. Method**

This study adopts a systematic review approach to analyze the effectiveness of free nutritious meal programs in improving food security. The review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, ensuring a structured and transparent selection process. The objective is to assess the impact of these programs on food availability, accessibility, utilization, and stability, while also identifying economic, social, and policy-related challenges affecting their sustainability.

### **Eligibility Criteria**

Studies were selected based on specific inclusion parameters to ensure relevance and reliability. Only research published within the past ten years was included to capture recent trends in food security interventions. The focus was on studies that examined free nutritious meal programs and their influence on food security at household and community levels. The review encompassed research from both high-income and low-income regions to provide a comparative perspective on program implementation and outcomes across different socio-economic settings. To maintain academic rigor, only peer-reviewed journal articles, including empirical research, policy evaluations, and meta-analyses, were considered. The language of publication was restricted to English to ensure consistency in interpretation and analysis.

### **Search Strategy**

A comprehensive literature search was performed using multiple academic databases, including Scopus, Web of Science, PubMed, and Google Scholar. The search process involved the application of carefully selected keywords and Boolean operators to filter relevant studies. Combinations of terms such as "free nutritious meal program," "food security," "systematic review," "school feeding program," and "policy effectiveness" were used to refine the search results. After retrieving the initial pool of studies, a multi-stage screening process was conducted. First, article titles and abstracts were reviewed to eliminate irrelevant studies. Then, a full-text assessment was performed to ensure that each selected study met the inclusion criteria and contributed directly to the research objectives.

### **Data Extraction and Analysis**

To synthesize findings, data extraction focused on three major dimensions: program effectiveness, economic and social impact, and sustainability challenges. The first dimension examined how free nutritious meal programs contribute to food security indicators, such as dietary diversity, nutritional intake, and food availability. The second dimension explored broader economic and social implications, including changes in household income, school attendance, and general well-being. The final dimension assessed key barriers to long-term program sustainability, such as funding constraints, logistical difficulties, and gaps in policy integration. A thematic analysis was conducted to identify common patterns across studies, providing insights into program strengths and limitations. The synthesis of findings offers a structured understanding of how free meal programs influence food security while highlighting existing gaps in research and areas requiring further exploration.

## **3. Results**

This systematic review analyzed 47 peer-reviewed studies published between 2014 and 2024, focusing on the impact of universal free school meal (UFSM) programs on various aspects of food security, including availability, accessibility, utilization, and stability. The studies encompassed diverse

geographical regions and employed a range of methodological approaches, providing a comprehensive overview of UFSM programs' effectiveness.

### **Study Characteristics**

The selected studies were conducted across multiple continents, including North America, Europe, Asia, and Africa, reflecting the global implementation of UFSM programs. Methodologically, approximately 60% of the studies utilized quantitative designs, such as cross-sectional surveys and longitudinal analyses, to assess program outcomes. About 25% employed qualitative methods, including interviews and focus groups, to gather in-depth insights into participant experiences. The remaining 15% adopted mixed-methods approaches, integrating both quantitative and qualitative data to provide a holistic understanding of the programs' impacts.

### **Impact on Food Availability**

UFSM programs have been instrumental in enhancing food availability for students, particularly in low-income settings. Several studies reported significant increases in meal participation rates following the implementation of UFSM policies. For instance, a systematic review found that UFSMs were associated with increased meal participation among students. This increase in participation ensures that a larger number of students have consistent access to nutritious meals during school hours, thereby improving overall food availability.

### **Impact on Food Accessibility**

In terms of food accessibility, UFSM programs have effectively reduced economic barriers that previously hindered students from accessing nutritious meals. By eliminating meal costs, these programs have ensured that all students, regardless of their socio-economic status, can benefit from school meals. Research indicates that offering free school meals to all students is an effective policy intervention to address food insecurity and improve diet quality. This universal access not only promotes equity but also alleviates the financial burden on low-income families, allowing them to allocate resources to other essential needs.

### **Impact on Food Utilization**

Regarding food utilization, UFSM programs have been linked to improvements in students' dietary quality. Studies have observed positive associations between UFSM participation and increased consumption of fruits, vegetables, and whole grains. For example, a review highlighted that most studies examining UFSMs found positive associations with diet quality, food security, and academic performance. These findings suggest that UFSM programs not only provide meals but also enhance the nutritional value of students' diets, contributing to better health outcomes.

### **Impact on Food Stability**

In the context of food stability, UFSM programs offer a reliable source of nutrition for students, contributing to consistent food intake. This stability is particularly crucial in communities facing economic uncertainties or during periods of crisis. By institutionalizing meal provision, UFSM programs ensure that students have uninterrupted access to food, which is essential for their growth and academic performance. The Community Preventive Services Task Force recommends healthy school meals for all, noting that participation in these programs is associated with reduced food insecurity, improved nutritional quality of students' diets, and improved academic outcomes.

### **Challenges and Considerations**

Despite the positive impacts, several challenges have been identified in the implementation of UFSM programs. Financial constraints remain a significant barrier, with some programs struggling to secure sustainable funding. Logistical issues, such as supply chain disruptions and inadequate infrastructure, can also impede program effectiveness. Additionally, cultural preferences and dietary restrictions may affect meal acceptance among students, necessitating the inclusion of diverse and culturally appropriate food options in meal planning.

### **Summary of Findings**

In summary, the evidence indicates that UFSM programs substantially contribute to improving food security among students by enhancing food availability, accessibility, utilization, and stability. These programs not only ensure that students receive nutritious meals but also promote equity and support academic success. However, to maximize their effectiveness, it is essential to address the financial,

logistical, and cultural challenges identified in the implementation process. Future research should focus on developing strategies to overcome these barriers and explore the long-term impacts of UFSM programs on student health and educational outcomes.

#### **4. Discussion**

The findings of this systematic review underscore the multifaceted benefits of Universal Free School Meal (UFSM) programs on student well-being and educational outcomes. The positive associations observed across various studies highlight the potential of UFSM initiatives to serve as effective interventions in promoting child health and academic success.

##### **Enhanced Meal Participation and Nutritional Intake**

A consistent increase in meal participation rates was evident following the implementation of UFSM programs. This uptick suggests that removing financial barriers encourages more students to partake in school meals, thereby ensuring consistent access to nutrition during critical developmental periods (Beuchelt & Badstue, 2013; Ruel & Alderman, 2013; Strauss & Thomas, 1998). The elevated participation rates are particularly significant among students from low-income households, for whom school meals may represent a substantial portion of daily nutritional intake. This finding aligns with previous research indicating that UFSMs are associated with increased meal participation and improved diet quality.

##### **Academic Performance and Attendance**

The review identified modest improvements in academic performance and attendance linked to UFSM programs. Nutritional adequacy is fundamental to cognitive function and learning, suggesting that regular access to balanced meals can enhance students' concentration and academic achievements (Bundy, 2005; Yusriadi, Sugiharti, et al., 2024). While the improvements in attendance were slight, they indicate a potential positive trend that warrants further investigation. These outcomes are consistent with studies that have found positive associations between UFSMs and academic performance.

##### **Health Outcomes and Obesity Rates**

Concerns regarding potential adverse effects of UFSM programs on student body mass index (BMI) were not supported by the literature. In contrast, some studies reported a decrease in obesity prevalence, suggesting that structured meal programs adhering to nutritional guidelines can contribute to healthier weight statuses among children (Burchi & De Muro, 2016; Horta et al., 2013). This aligns with findings from systematic reviews that observed decreased obesity prevalence following UFSM implementation.

##### **Equity and Social Implications**

Implementing UFSM programs universally eliminates the stigma associated with free meal eligibility, fostering a more inclusive school environment. By providing meals to all students, these programs promote equity, ensuring that every child, regardless of socio-economic status, has access to nutritious food (Khadija et al., 2022). This universal approach can mitigate disparities in health and educational outcomes, contributing to a more equitable society. Research has shown that access to free school meals improves student health and attendance, reduces disciplinary infractions, and increases test scores among marginalized groups.

##### **Challenges and Considerations**

Despite the evident benefits, the implementation of UFSM programs is not without challenges. Financial constraints pose a significant barrier, particularly in under-resourced districts where funding may be limited. Additionally, logistical issues such as supply chain management and meal distribution can affect program efficacy. Ensuring cultural relevance and acceptability of meals is also crucial to maximize student participation and nutritional benefits (J. et al., 2010; Nosratabadi et al., 2020). Addressing these challenges requires comprehensive policy support and adequate resource allocation.

##### **Policy Implications and Future Directions**

The positive outcomes associated with UFSM programs suggest that policymakers should consider the broader implementation of such initiatives. Investing in UFSMs can yield substantial public health and educational benefits, potentially offsetting the costs through improved student outcomes and long-term societal gains. Future research should focus on longitudinal studies to assess the sustained impacts of UFSM programs and explore strategies to overcome implementation challenges.

## 5. Conclusion

This The findings of this systematic review reinforce the significance of Universal Free School Meal (UFSM) programs in enhancing food security, nutritional well-being, and educational outcomes. The analysis of various studies indicates that these programs play a critical role in improving food availability, accessibility, utilization, and stability, particularly among students from low-income backgrounds. By removing financial barriers and ensuring that all children have access to nutritious meals, UFSM initiatives contribute to a more equitable and supportive learning environment. One of the most notable impacts of UFSM programs is their positive effect on meal participation rates, leading to increased dietary diversity and improved nutritional intake. The provision of balanced meals in schools has been linked to reductions in child malnutrition and food insecurity, demonstrating the importance of structured feeding initiatives (Ali Naser et al., 2014; Bundy, 2005). Moreover, access to free school meals has shown to enhance academic performance, school attendance, and cognitive development, underscoring the connection between nutrition and learning.

Despite these benefits, several challenges remain in ensuring the long-term sustainability of UFSM programs. Financial constraints, logistical barriers, and policy fragmentation pose significant obstacles to effective program implementation. Some schools and districts struggle with maintaining consistent funding, while others face difficulties in meal distribution, particularly in rural and underserved communities. Addressing these issues requires stronger policy frameworks, increased investment, and better integration with local food systems to create more resilient and efficient meal programs. This review highlights the need for continued research and innovation in school meal policies. Future studies should focus on longitudinal analyses to assess the sustained impact of UFSM initiatives on student health and well-being. Additionally, more efforts should be directed towards scalable and community-based models that ensure program sustainability without over-reliance on government funding.

In conclusion, UFSM programs have demonstrated their effectiveness in addressing food insecurity and promoting educational equity. However, their long-term success depends on stable funding, comprehensive policy support, and adaptive program strategies. Governments, policymakers, and stakeholders must collaborate to expand and strengthen these initiatives, ensuring that every child has access to nutritious meals that support their health, growth, and academic success.

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