

Integration of Halal Literacy and Food Safety Aspects in Elementary School Canteens: A Case Study of Halal Critical Points and a Risk-Based Educational Approach

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Keywords:

Halal and Tayyib, Canteen, Critical Point, Halal Literacy

Abstract

Elementary school canteens play a vital role in providing daily meals for the school community. However, adherence to halal principles is crucial. Halal safety has not been fully guaranteed, both in terms of ingredients, processes, and packaging. This study aims to identify halal critical points (CCPs) and the level of halal literacy of elementary school students, and formulate risk-based improvements in accordance with the Halal Product Assurance regulation (Law No. 33/2014) and BPOM provisions on food packaging. A qualitative-quantitative research design was used through structured observations, interviews, and halal literacy questionnaires with 5 canteen operators, 120 students, and 3 teachers in Bandung Regency. Risk analysis based on severity \times likelihood values resulted in four main CCPs: (1) washing cutlery in the toilet; (2) exposure to flies on food; (3) use of styrofoam for hot food; and (4) low student halal literacy (average score 54.3%). Recommendations for improvement include the establishment of a dedicated cutlery washing zone, vector control, replacing hot packaging with safe materials (PP5/food-grade paper), and halal education. Tayyib integrated into science learning. This study emphasizes the integration of the halal risk mapping system. Tayyib in the context of elementary school canteens, which has not been widely implemented before, as well as the proposal of a halal literacy-based education model integrated into the science curriculum to increase halal awareness among students. The results of this study provide a model for halal school canteen practices. Risk-based tayyib that can be implemented in other schools as part of the Healthy School program and supports the National Halal Product Guarantee.

INTRODUCTION

Elementary schools are part of basic education institutions located in various regions, one of which is spread throughout Bandung Regency. One elementary school in Bandung Regency consists of 259 elementary school students, 34 teachers, and educational staff. The large number of students increases the need for food as a source of basic necessities in the school environment. A variety of food choices are available, but are dominated by fast food and processed flour snacks. For example, processed wheat flour, processed tapioca flour, processed chicken, bread, instant noodles, and others. This does not meet the nutritional adequacy rate, especially the food needs of students for growth and development, especially being a critical point for halal food for students according to Law No. 33 of 2014 (Jatmika et al., 2024).

Fast food and processed snacks sold around schools tend to be low in nutritional value and potentially unhygienic, making them unhealthy for children. From an Islamic perspective, food consumption should meet the principles of halal and thayyiban, meaning food must be not only halal (permissible according to religious law) but also thayyib (good and beneficial for health). This halal-thayyib concept requires that food be not only free from prohibited substances or ingredients but also of good quality, nutritious, and safe for consumption (Amini et al., 2022). Thus, ideally, the food available at school should meet both halal and tayib criteria, for example, it should be assessed from the aspect of hygiene and nutritional value that is healthy for students because it is closely related to student growth and development (Nazihah & Arifin, 2020).

Around 45–72% of school snacks in Indonesia have been proven to not meet food safety standards, because they contain hazardous substances such as formaldehyde, borax, and textile dyes, and are contaminated with *Escherichia coli* bacteria. This condition causes 35% of cases of digestive disorders and poisoning in students, indicating that many snacks in canteens and outside of schools are unhygienic, unhealthy, and not thayyib. This phenomenon reflects weak supervision of food safety for school children and low awareness of food hygiene and health principles among snack producers and sellers. Therefore, continuous education and mentoring are needed for schools, students, and traders to ensure that the snacks consumed by children are safe, nutritious, and comply with the principles of halal-thayyib as research shows (Putri et al., 2023). However, the integration of halal-thayyib values and halal literacy among elementary school students has not been widely studied empirically. Therefore, this study offers a new approach based on CCP-CP risk analysis to detect halal critical points and assess halal understanding among elementary school students. Furthermore, research conducted by (Cahyanto et al., 2023). This study illustrates the link between halal literacy and science learning in schools. However, this study did not focus on halal literacy in science learning at the elementary school level.

From the perspective of the Muslim community, food quality and safety are reflected in the concept of halal thayyiban, meaning that food must not only be halal according to Islamic law but also be pure and hygienic. However, in practice, the pure and hygienic aspect is often overlooked. Various studies show that although most traders understand the meaning of halal, only about one in eight truly understand the obligation to maintain food quality and hygiene (Sucipto et al., 2023). This situation creates a gap between understanding and practice, as halal food is not necessarily healthy if it is prepared unhygienically. Therefore, integrating halal and thayyib principles in school canteens is crucial, as they serve as providers of safe, nutritious, and religiously compliant food, as well as serving as educational resources for students. Implementing halal and thayyib principles in school canteens will ensure that all food is free from haram ingredients, is prepared hygienically,

and supports the development of healthy and ethical eating habits in accordance with Islamic teachings (Iqbal & Afifah, 2025).

This study offers a unique approach by focusing on the application of halal-thayyib principles in elementary school canteen management, particularly in one elementary school, which has not been widely explored before. The uniqueness of this study lies in the integration of Islamic religious values and health standards in school food management. Furthermore, this study also seeks to assess the extent of understanding and implementation of halal-thayyib principles among school snack vendors, as well as their impact on student health. Considering the fact that many school snacks still have low nutritional quality and hygiene, this study fills a gap in the literature regarding the importance of halal-thayyib education for all school stakeholders, from schools, students, to snack vendors.

Integrating halal and thayyiban principles into school canteens is crucial because they play a strategic role in providing healthy, safe, and halal food for the school community, as well as serving as an educational platform for developing healthy eating habits. Implementing halal and thayyiban principles means ensuring that all food and beverages are free from haram ingredients and are hygienically prepared according to health standards, in order to protect students' health and foster nutritious consumption habits that align with religious and ethical values (Zaharudin et al., 2022). This study aims to assess the implementation of halal principles in elementary school canteen management, identify factors that influence their understanding and implementation among street food vendors, and develop recommendations to improve the quality and safety of food provided in schools. This study aims to contribute to creating a healthy and beneficial school atmosphere for students, and to ensure that the implementation of halal principles is carried out in accordance with applicable regulations.

METHODS

This study uses a qualitative descriptive approach supported by simple quantitative data (mixed method descriptive study). This approach was chosen to describe the actual conditions of the implementation of halal and thayyib principles in the environment of an elementary school in Bandung Regency, as well as to identify halal critical points (Critical Control Points/CCPs) and control points (Control Points/CPs) in the food service chain at the school. Qualitative data were used to examine the behavior, understanding, and hygiene practices of canteen operators, while quantitative data were used to map the risk level and the level of halal literacy of students. Qualitative data collection techniques were carried out by conducting interviews while quantitative data were through observations based on likelihood and severity values and values based on

questionnaires. The study was conducted in an elementary school, Bandung Regency, in October 2025. This school was selected purposively because it has a large number of students (259 students) with active canteen activities every day, making it relevant as a case study location for the implementation of halal thayyiban principles in an elementary school environment.

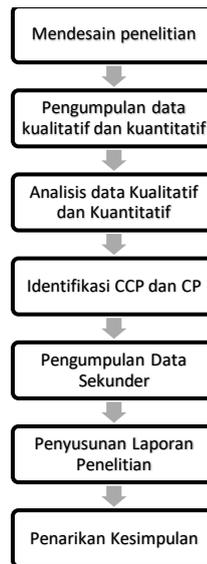
This study used two types of data: qualitative and quantitative, supporting a mixed methods descriptive study approach. Qualitative data collection included semi-structured interviews with canteen staff and field observations focused on hygiene practices and food presentation, as well as student snack selection behavior. Quantitative data included a halal literacy questionnaire to measure students' understanding of halal and thayyib principles, and an observation questionnaire to assess students' level of involvement in selecting food that complies with halal principles. Additionally, likelihood and severity scales were used to map the level of risk in food presentation in the canteen.

Before being used in the research, all instruments were validated by senior elementary school teachers. Validators provided assessments and feedback regarding the instruments' relevance and appropriateness in the context of elementary education, ensuring that each instrument provided valid and reliable data to measure students' understanding and hygiene practices in the school environment. This validation aimed to ensure that the instruments used were appropriate for the research objectives and acceptable in the elementary school context, thus producing accurate and relevant data.

Subjects and Data Sources

The subjects of this study consisted of five canteen staff serving and managing food, 120 fourth-sixth grade students who responded to the halal literacy questionnaire, and three teachers or homeroom teachers who served as supporting informants in observing student behavior when choosing snacks. Subjects were selected purposively based on their direct involvement in food consumption activities in the school environment. Data sources in this study are divided into two types: primary data and secondary data. Primary data were obtained directly through field observations, student questionnaires, and interviews with canteen staff and teachers. Meanwhile, secondary data were obtained from various regulations and official documents, including Law Number 33 of 2014 concerning Halal Product Assurance, Government Regulation Number 42 of 2024 concerning the Implementation of Halal Product Assurance, BPJPH Decree Number 40 of 2022 concerning the Indonesian Halal Label, and BPOM Regulation Number 20 of 2019 concerning Food Packaging. In addition, secondary data is also strengthened by scientific literature taken from SINTA 1–3 and Q1–Q3 indexed journals published between 2020 and 2025.

Figure 1 Flowchart of Research Steps



RESULTS AND DISCUSSION

Based on case studies in the field, in the five aspects that were focused on, the researchers obtained results as presented in Table 1.

Table 1. Mapping of Food Safety Risks and Halal Aspects in School Canteens/Vendors

Observed Aspects	Field Findings	Likelihood	Severity	Risk category	Critical Point Description
Hygiene (Washing cutlery)	3 out of 5 vendors wash their equipment in the toilet during break time; the water is running but the area is narrow and mixed with student activities.	5	5	Very high	Risk of contamination by feces and microbes; requires a dedicated washing zone.
Hygiene (Food Storage)	Four vendors displayed raw materials and snacks openly without covers; flies were found in the display cases of two vendors.	4	4	Very high	Need a closed display case and hygienic fly trap.

Use of dangerous packaging (Styrofoam and plastic)	A seblak seller uses Styrofoam container as a food container. hot soup, the container sometimes softens when exposed to heat	4	3	Tall	Risk of chemical contamination from packaging.
Halal labels and distribution permits on packaged products	5 out of 10 drinks sold have a halal label and BPOM distribution permit; the rest do not have an official label.	3	3	Currently	It is necessary to select halal certified suppliers.

The results of this case study indicate that most vendors have not yet implemented the principles of halal and thayyib food for school residents. For example, washing cookware in the bathroom can lead to cross-contamination from residual feces in the bathroom. Furthermore, various types of bacteria present in the bathroom pose a significant risk of contamination to the cookware being washed. (Schencking & Stamminger, 2022). The hygiene and sanitation conditions of school canteens, based on research observations, still require improvement to comply with the principles of thayyib. Several findings, such as the lack of adequate sinks for dishwashing, food handlers sometimes not wearing gloves or head coverings, and serving areas being close to trash cans, indicate the potential for contamination. Meanwhile, school canteen hygiene standards require adequate sanitation facilities, namely the availability of clean running water for washing equipment and hands, clean equipment storage, and a canteen location far from sources of pollution (Sri Mulyani & Suryapermana, 2020).

Food packaging must also meet the requirements of thayyib, meaning it is safe for health. Recent research highlights the issue of microplastics in school snacks as a hidden health threat (Kastilon et al., 2024). Microplastic particles can come from single-use plastic packaging used to wrap food or drinks; when they come into contact with hot food, microscopic plastic fragments can be released and contaminate the food (Puspita et al., 2022). Field findings in the school canteen case study indicate the still dominant use of plastic packaging, for example the use of plastic cups or plastic wrap for hot food. Therefore, this study can reveal the significant risk of microplastic exposure for children consuming food and drinks in the school canteen. From a halal-thayyib perspective, this practice needs to be evaluated. The thayyib principle emphasizes safety and

hygiene, so the use of non-food-grade packaging or packaging that has the potential to release hazardous substances must be reduced. Improvement efforts can include switching to food-grade paper packaging, organic materials, or safe, reusable food containers that students can bring.

Furthermore, food packaging is closely linked to halal principles, especially for factory-processed products. According to the Halal Product Guarantee Law, all processed foods and beverages in circulation must be halal certified, indicated by a halal logo on their packaging. In reality, advances in food technology have also brought imported products or modern snacks into the school environment, which sometimes do not yet have a halal logo. This situation requires attention: students need to be trained to critically select packaged foods that are guaranteed halal. Without adequate literacy, children can be tempted by modern snacks without realizing their halal status. Therefore, integrating the halal-thayyib principles includes ensuring that the halal label on the packaging is clearly visible and understood by students (Yuwana & Hasanah, 2021).

Table 2. Students' Halal Literacy Profile: Knowledge Indicators and Analytical Skills

No	Indicator	Statement Items	Percentage of "Yes" (%)
1	Knowledge	Understanding the concepts of halal and thayyib	44.2
2	Knowledge	Recognizing the Indonesian Halal logo	49.2
3	Knowledge	Knowing the BPOM distribution permit	42.5
4	Knowledge	Know the haram ingredients (alcohol, pork)	46.7
5	Knowledge	Knowing the importance of clean processes in food	48.3
6	Analytical Skills	Avoid open food/exposed to flies	60.8
7	Analytical Skills	Pay attention to hot food packaging	52.5
8	Analytical Skills	Distinguishing between genuine and non-genuine halal labels	44.2
9	Analytical Skills	Avoid food in hot styrofoam	40.8
10	Analytical Skills	Ask about halal labels/packaging before purchasing	50.0
11	Attitude & Behavior	Considering the importance of halal and thayyib food in schools	71.7
12	Attitude & Behavior	Tell a friend if the food looks unclean	53.3
13	Attitude & Behavior	Want to learn to read halal labels and distribution permits?	64.2
14	Attitude & Behavior	Prefer snacks that are covered and clean	70.8
15	Attitude & Behavior	Feel proud if the school canteen is halal and thayyib	75.8

Meanwhile, students' understanding of the concept of halal-thayyib is still varied and not yet fully optimal, as shown in Figure 1. Most students have an understanding that is close to correct, but there are also those who still need to deepen the concept of halal and thayyib.

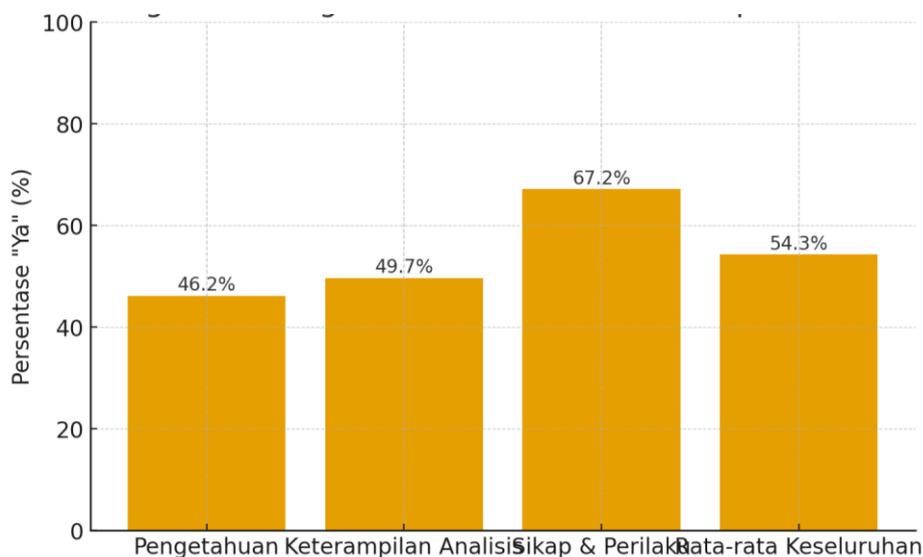


Figure 1. Bar chart showing the percentage of "Yes" responses for each domain of students' halal literacy. The attitudes and behavior domain had the highest average (67.2%), while knowledge was in the lowest category (46.2%).

This condition aligns with the findings of Sumiati et al. (2024) in another elementary school, where students' halal literacy varied and was uneven. With more accurate findings and data in this study, this phenomenon can be clarified. The low halal literacy among students is primarily due to a lack of education and outreach regarding the importance of the quality, cleanliness, and healthfulness of halal and thayyib food products, particularly through integration with classroom learning (Cahyanto et al., 2023). Therefore, an educational approach from an early age is crucial. Parents, teachers, and elementary school cafeteria managers play a crucial role in instilling this understanding, so that children become accustomed to choosing snacks that meet halal and thayyib standards (Jatmika et al., 2024).

The condition of an elementary school canteen, which was found to still be practicing unhygienic practices, requires serious attention, as young children are highly vulnerable to foodborne illnesses. Consuming unhealthy and unhygienic snacks contributes to the dual nutritional problem in children (both malnutrition and overweight) and an increased risk of non-communicable diseases later in life. (Tanziha, 2022). Therefore, improving hygiene and sanitation in school canteens is very necessary as an implementation of the thayyib concept. Improvement steps that can be taken include: (1) Training canteen managers on food hygiene and environmental

sanitation; (2) Provision of handwashing facilities with soap for students and handlers; (3) Routine supervision by UKS officers or local health services; and (4) Implementation of healthy canteen procedures according to the Ministry of Health guidelines.

CONCLUSION

This study shows that the integration of halal-thayyib principles in elementary school canteens still faces various challenges, both in terms of food serving practices, student literacy, and regulatory compliance. Identification of critical halal points in the canteen of one elementary school revealed that the practice of washing cutlery in the toilet, exposure to flies on food, the use of Styrofoam packaging for hot food, and the lack of adherence to halal labels are real potential risks to the halal status and thayyib quality of food consumed by students. The level of halal literacy of students is moderate, with an uneven understanding of the importance of safe food packaging, distribution permits, and behavior in choosing snacks that comply with halal and thayyib principles. This lack of understanding can lead students to consume unhealthy and unhygienic foods. Furthermore, food packaging that does not meet safety standards, and weak control over canteen cleanliness and sanitation, indicate the need for comprehensive improvement. This study has limitations because it only focuses on one school level, so it cannot describe the condition of halal-thayyib compliance at different levels of education. Therefore, further in-depth research is needed by comparing canteens at the elementary, middle, and high school levels to obtain a more comprehensive picture. Furthermore, further assessment is needed regarding the level of understanding and implementation of the halal-thayyib concept by canteen operators so that the data obtained can strengthen the relationship between knowledge and practice in the field. As a recommendation, the development of operational guidelines in the form of halal-thayyib food hygiene SOPs and regular training for canteen operators are crucial to improving the safety, quality, and blessings of food served to students.

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