

Strategy mapping for reopening school canteen in new normal era by safety and halal standard

Sucipto Sucipto, Titis Sari Kusuma, Khothibul Umam Al Awwaly, Muhammad Arwani, Luki Hidayati & Judhiastuty Februhartanty

To cite this article: Sucipto Sucipto, Titis Sari Kusuma, Khothibul Umam Al Awwaly, Muhammad Arwani, Luki Hidayati & Judhiastuty Februhartanty (2023) Strategy mapping for reopening school canteen in new normal era by safety and halal standard, Cogent Food & Agriculture, 9:1, 2248700, DOI: [10.1080/23311932.2023.2248700](https://doi.org/10.1080/23311932.2023.2248700)

To link to this article: <https://doi.org/10.1080/23311932.2023.2248700>



© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 30 Aug 2023.



Submit your article to this journal [↗](#)



Article views: 1089



View related articles [↗](#)



View Crossmark data [↗](#)



Received: 27 January 2023
Accepted: 11 August 2023

*Corresponding author: Sucipto
Sucipto, Department of
Agroindustrial Technology, Faculty of
Agricultural Technology, Universitas
Brawijaya, Malang, 65145, Indonesia
E-mail: ciptotip@ub.ac.id

Reviewing editor:
María Luisa Escudero Gilete,
Nutrition and Bromatology,
Universidad de Sevilla, Spain

Additional information is available at
the end of the article

FOOD SCIENCE & TECHNOLOGY | RESEARCH ARTICLE

Strategy mapping for reopening school canteen in new normal era by safety and halal standard

Sucipto Sucipto^{1,2*}, Titis Sari Kusuma³, Khothibul Umam Al Awwaly⁴, Muhammad Arwani¹, Luki Hidayati¹ and Judhiastuty Februhartanty⁵

Abstract: The school canteen must provide nutritious, safe, and halal food. During the COVID-19 pandemic, it was not easy to manage the canteen operations. This study aims to map the barrier, driving factors, and priorities strategy to prepare for reopening the senior high school's canteen with safe and halal standards in the new normal era. This study was analytically observational with a cross-sectional approach in nature. SWOT and Fuzzy-ANP (F-ANP) methods identified and determined the priority strategies. The SWOT analysis results show that internal factors are moderate, but external factors strongly influence the school canteen's position, hence growth and development strategies are required. Based on weighted priority by F-ANP six strategies are recommended. The six strategies to reopen safe and halal of Senior High School canteen are as follows: establish school canteen



Sucipto Sucipto

ABOUT THE AUTHORS

Sucipto Sucipto is a lecturer and researcher at the Department of Agroindustrial Technology, Faculty of Agricultural Technology, Universitas Brawijaya. His main research interests are quality systems, halal, and food safety.

Titis Sari Kusuma is a lecturer and researcher at the Department of Nutrition Science, Universitas Brawijaya. She specialises in food safety, food microbiology, and food science.

Khotibul Umam Al Awwaly is a lecturer and researcher at the Department of Animal Product Technology, Universitas Brawijaya. He is a specialist in animal product technology. His research interest is in the biotechnology of byproducts.

Muhammad Arwani graduated from the Department of Agroindustrial Technology, Universitas Brawijaya, and then became a lecturer at the Nahdlatul Ulama University of Indonesia. His research focuses on food processing and quality.

Luki Hidayati is a researcher assistant in Halal Qualified Industry Development (Hal-Q ID) at Universitas Brawijaya.

Judhiastuty Februhartanty is a researcher at Seameo Recfon, Universitas Indonesia. She has a research area in community nutrition.

PUBLIC INTEREST STATEMENT

School canteens should provide nutritious, safe, and halal food. It is not easy to manage a school canteen in the new normal era. This paper maps out the barriers, drivers, and strategies for reopening school canteens with safe and halal standards. The results of the prioritised strategies resulted in six strategies for reopening safe and halal school canteens: building a commitment to school canteen management with food handlers and other stakeholders with clear communication; school canteen authorities should consider affordable menu prices; serving various safe and halal menus according to purchasing power, especially students; conducting education or training according to the needs of the school academic community and canteen management for food safety and halal; develop new menus or reformulate existing menus taking into account school academics and supporting food safety, halal, and nutrition; and finally, conducting training on safe and halal menu processing and serving for school canteen managers and food handlers.

management commitment with food handlers and other stakeholders with distinct communication; develop safe and halal school canteens, the authority should consider affordable menu prices; serving a variety of safe and halal menus according to the purchasing power, mainly students; conduct education or training according to the needs of school academia and canteen management for food safety and halal; develop new menus or re-formulate existing menus considering school academia and supporting food safety, halal, and nutrition; and finally, conduct training on processing and serving safe and halal menus for school canteen managers and food handlers. These alternative strategies are expected to better prepare for reopening the school canteen with safe and halal standards in the new normal era.

Subjects: food science & technology; food safety; halal assurance system; strategic management

Keywords: halal; post-pandemic; reopening; safe; school canteen

1. Introduction

The fulfilment of food is not only adequate in nutrition but also safe, halal, and meets the standard. The need to consume halal food is required for Muslims, on the other hand for non-Muslims safety reasons are crucial (Nurrachmi, 2017). The trending market for halal and *thayyib* products continues to increase (Nizam et al., 2019; Sukoso et al., 2020). Halal food is food which is qualified according to the Islamic law. *Thayyib* refers to good to the senses (pure) or clean or is not painful and repellent (Arif, 2011). The school canteen supports academic units with two critical roles: health and education (Direktorat Sekolah Menengah Atas, 2020). Health refers to facilities for providing nutritious, safe, and halal food, and education refers to the canteen function as a learning media. The school canteen usually offers menus with relatively affordable prices, however, safety, halalness, and nutritional aspects also need to be considered. Research on food safety in school canteens is widely studied. Wallace et al (2005, 2014) standardized and identified the Hazard Analysis and Critical Control Points (HACCP) assessment difficulties. Osimani et al (2013, 2015, 2018) audited hygiene and assessed HACCP systems in the university canteen and fresh products. Critical Control Point (CCP) consists of physical, chemical, and biological hazards (Allata et al., 2017).

Besides food safety assurance, school canteens require to implement Halal Assurance System (HAS). The application of HAS is not only for carrying out Islamic law but also for business opportunities, for example, the school canteen. HAS 23,000 consists of 11 criteria to apply for halal certification. HAS criteria included: (1) halal policy, (2) halal management team, (3) training and education, (4) materials, (5) products, (6) production facilities, (7) written procedures for critical activities, (8) traceability, (9) handling of products that do not fulfil the criteria, (10) internal audit, and (11) management review to assess the conformity of HAS. Halal-certified products should not be produced from *haram* (unlawful) or *najis* (unclean in Islamic law) materials. The organization needs to support documents such as halal certificates, flow charts, and technical specifications. The materials and processes used are guaranteed to be halal. The university canteens with halal food need halal certification (Sucipto et al., 2018).

Implementing a safe and halal school canteen requires commitment and good management. However, during the COVID-19 pandemic, it was not easy to manage the school canteen because it is closed due to online learning. Society in big cities strongly desires to participate in out-activities following the COVID-19 pandemic, as the Indonesian government plans to establish new normal circumstances. The out-activities are new normal settings related to specific sites, such as workplaces, schools, shopping centres, food businesses, tourism sites, and other social activities (Irawan et al., 2020). This situation needs preparation for reopening the school canteen in the

new normal era. Food Standard Agency states that reopening food businesses should follow safety procedures during the COVID-19 pandemic: preparation and planning, site inspections, equipment inspections, material and product inspections, and COVID-19 protocol measures (Food Standard Agency, 2020).

Yoong et al. (2019) developed an implementation strategy for a healthy canteen that related to government mandatory policies. However, it was not in COVID-19 condition and not related to the halal standard canteen. The preparation for reopening school canteens is studied to map the barriers and drivers for implementing safety and halal and improving stakeholder's awareness. Canteens which became the locus of this research were selected at Senior High School in Malang as a student city in East Java. In Indonesia, there is also no model for developing Senior High School canteen with a halal standard. Therefore, this study is among the first which provide a new model for implementing safety and halal school canteens. This study aims to provide a quantitative basis for a priority strategy for reopening high-school canteens with safe and halal standards during the new normal era.

2. Methods

2.1. Research design

This research is the exploratory design using Strength, Weakness, Opportunity, and Threat (SWOT) analysis and Fuzzy-Analytical Network Process (F-ANP) with stage in Figure 1. The research was conducted from September to November 2021. This research is adjusted to the conditions in Indonesia, which is experiencing Covid 19. Data collection was performed using a questionnaire, and the respondents are listed in Table 1.

Information on internal and external factors influencing strategy development was collected based on literature and expert opinion. SWOT was performed to identify barriers and driving factors. F-ANP was used to assist in the prioritisation of the strategies.

Figure 1. Research methodology.

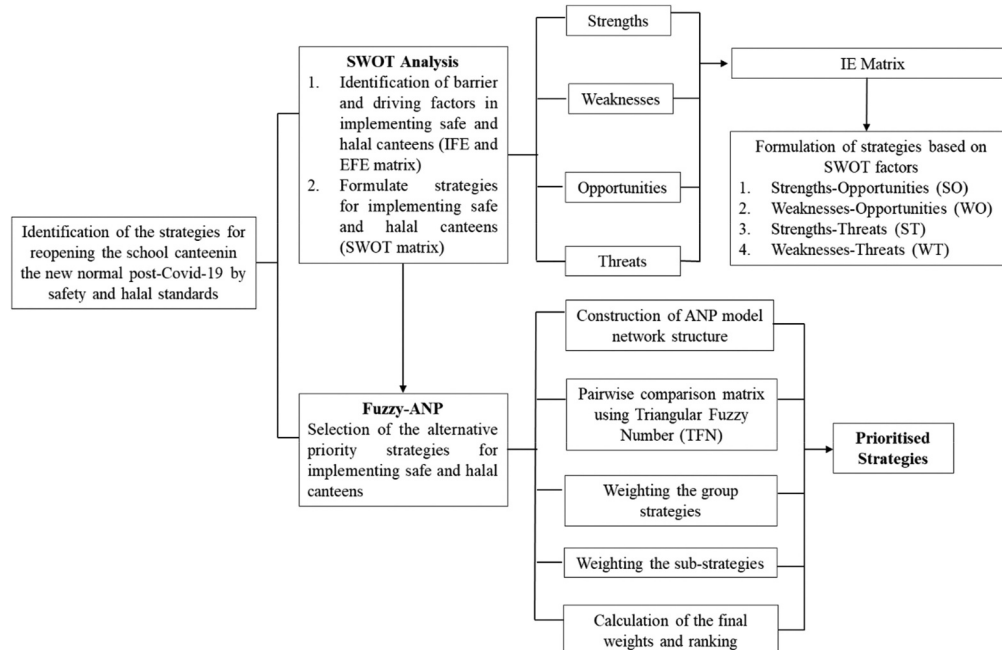


Table 1. Respondent list			
	Type	Number of respondents	Qualification
Respondents for SWOT analysis	Food handlers	1	<ul style="list-style-type: none"> • Muslim • Minimum undergraduate degree • Food handlers understand the internal conditions of the school canteen and have direct contact with food.
	School canteen managers	2	<ul style="list-style-type: none"> • Muslim • Minimum undergraduate degree • The school canteen manager has responsibility for operational management.
	School principals	2	<ul style="list-style-type: none"> • Muslim • Minimum undergraduate degree • The principal oversees the canteen manager and food handlers and has the functional role of supervising.
	Halal centre institute at the university level	1	<ul style="list-style-type: none"> • Muslim • Minimum master's degree • Halal experts have competency qualifications in food safety and halal food.
Total		6	
Expert respondents for F-ANP analysis	School canteen managers	2	<ul style="list-style-type: none"> • Muslim • Minimum undergraduate degree • The school canteen manager understands the operational management and is responsible for the internal management of the school canteen, so opinion is important in formulating strategies.

(Continued)

Table 1. (Continued)			
	Type	Number of respondents	Qualification
	School principal	1	<ul style="list-style-type: none"> • Muslim • Minimum undergraduate degree • The school principal has a functional and strategic role in the school canteen's management.
	The public health department in local government	1	<ul style="list-style-type: none"> • Muslim • Minimum master's degree • The public health department must protect the community from unhealthy food distribution, including in the school canteen. One of the programmes is socialisation and canteen development. The public health department coordinates with schools in developing a healthy canteen programme. Therefore, the role of the public health departments is vital in strategy formulation.
	Ministry of religious affairs in local government	1	<ul style="list-style-type: none"> • Muslim • Minimum master's degree • Ministry of religious affairs has a programme to strengthen halal canteens and control halal food regulations. The opinion is important in formulating a safe and halal canteen strategy.
	Halal centre institute at the university level	1	<ul style="list-style-type: none"> • Muslim • Minimum master's degree • Halal experts have competence in food safety and the Halal Assurance System (HAS).
Total		6	

2.2. SWOT analysis

A SWOT analysis was used to determine the barrier, driving factors and formulate a strategy for implementing safe and halal canteens standards. SWOT analysis is a technique that gives valuable information about internal and external factors in influencing organizational development favourably and adversely and assists decision-makers in the optimal strategy (Khan, 2018). This method has been employed in strategic management and planning research (Mukeshimana et al., 2021). The internal factors include strengths and weaknesses, and external factors include threats and opportunities (Sevklı et al., 2012). The internal and external factors in SWOT matrix can be seen in Table 2. Moreover, the Internal Factor Evaluation (IFE), External Factor Evaluation (EFE), Internal—External (IE) matrix and SWOT matrix were formed.

2.2.1. IFE, EFE, IE, and SWOT matrix

The IFE matrix is used to identify and evaluate the strengths or weaknesses of the internal organization that is considered necessary. The EFE matrix is used to identify and evaluate the organization's external factors (Umar, 2008). The value of the IFE and EFE matrices are entered into the IE matrix to determine the organization's position. The procedures of SWOT analysis in the development of the IFE and EFE matrices are the identification of internal and external factors (Table 2), determining the weight of each factor (scale 1–5), rating (scale 1–4), and total score of IFE and EFE.

Budiono (2017) states that the total score range for the IFE and EFE matrices is between 1–4. The x-axis (IFE matrix) in the IE matrix shows that if the total score category is at 1–1.99 indicates the internal position is weak, 2–2.99 indicates moderate, and 3–4 means strong. The y-axis (EFE matrix) in the IE matrix also shows the same total score category. The IE matrix provides an overview of the grand strategy. The nine cells of the IE matrix are divided into three main areas with different strategic (Setyorini et al., 2016). The SWOT matrix consists of four cells to propose alternative strategies. Four possible alternative strategies were developed after completing the four key factor cells.

2.3. Fuzzy ANP

F-ANP was used to select alternative priority strategies. Using the F-ANP method based on the SWOT matrix, alternative strategies can be formulated and prioritized. This priority will be easier to choose the primary plan if resources are limited. The following F-ANP procedures are as follows (Aghasafari et al., 2020): 1. Create an ANP model network structure. 2. Determination of inner dependence. 3. The weighting of each criterion, determinate of dependence between the criteria and sub-criteria. The data from the expert's assessment results are in the form of numerical values in the SWOT matrix, so each assessment needs to be tested for consistency through the following steps: create a pairwise comparison matrix; matrix normalization; determine the eigenvector; finding the largest eigenvalue; determine the consistency index; and calculating consistency ratio. Mohanty et al. (2005) state that the F-ANP approach is commonly used for weighting criteria. Instead of the discrete Saaty's scale of 1–9, Fuzzy-ANP is an upgraded form of the ANP that uses a triangular fuzzy number (TFN) scale in Table 3.

After the respondent's assessment matrix is consistent, the value is converted to the TFN value. For example, $X = \{x_1, x_2, \dots, x_n\}$ the set of objects and $U = \{u_1, u_2, \dots, u_n\}$ the setting of objectives. Each object is taken, and an expansion analysis is carried out for each purpose, g_i . Therefore, the value of the expansion analysis for each object is obtained:

$$M_{gi}^1, M_{gi}^2, \dots, M_{gi}^m, \quad i = 1, 2, \dots, n$$

where M_{gi}^j ($j = 1, 2, \dots, m$) is the value of TFN.

The steps of the Fuzzy method developed by Chang (1996) are as follows (Dağdeviren & Yüksel, 2010):

Table 2. Internal and external factors in SWOT matrix for reopening school canteen in a new normal era

	Strength	Weakness
Internal Factor	<p>S1: The price of the menu in the canteen is relatively affordable (Fitriani, 2020).</p> <p>S2: The role of the school canteen as a supporter of the learning process (Direktorat Sekolah Menengah Atas, 2020).</p> <p>S3: It has a big market share (Nurmaydha et al., 2019).</p> <p>S4: School management support to reopen canteens operational.</p>	<p>W1: Lack of knowledge and skills in human resources regarding food safety & halal menu processing and serving (Februhartanty et al., 2018).</p> <p>W2: During the COVID-19 pandemic, consumers lacked confidence in the food products sold outside (including in schools) (Karo & Hamonangan, 2021).</p> <p>W3: Restrictions Towards Community Activities (PPKM) and online schools during the COVID-19 pandemic have made it difficult to carry out canteen management activities.</p> <p>W4: Lack of commitment from the canteen management (managed by a single party and the absence of a regular management system) (Februhartanty et al., 2018).</p> <p>W5: School canteen facilities and infrastructure are inadequate</p> <p>W6: The need for nutritional value is not sufficient</p>
	Opportunity	Threat
External Factor	<p>O1: The existence of a safe and halal guaranteed canteen is still limited, so opportunities are more extensive (Nurmaydha et al., 2019).</p> <p>O2: The demand to provide school canteens that are guaranteed safe and halal according to the latest regulations (Pujiono et al., 2018).</p> <p>O3: Implementation of Face-to-face Learning (PTM) in the new normal era</p> <p>O4: The importance of consuming safe food during the COVID-19 pandemic increases consumer demand for healthy food (Karo & Hamonangan, 2021).</p> <p>O5: The role of the school committee (parent/ guardian association) in supporting the student learning process.</p>	<p>T1: The acceptance of the school academic community, especially students, towards safe and halal canteens is still limited.</p> <p>T2: Students prefer to buy food outside the school canteen.</p> <p>T3: The COVID-19 pandemic has caused several food businesses to close (one of them is the canteen).</p> <p>T4: Many choices of online food products outside of school.</p>

Step 1: Fuzzy synthesis value for the i-th object defined as

$$S_i = \sum_{j=1}^m M_{gi}^j \otimes \left[\sum_{i=1}^n \sum_{j=1}^m M_{gi}^j \right]^{-1} \quad (1)$$

To obtain $\sum_{j=1}^m M_{gi}^j$, the operation of adding the fuzzy m synthesis value is carried out on the pairwise comparison matrix:

$$\sum_{i=1}^n \sum_{j=1}^m M_{gi}^j = (\sum_{i=1}^n l_i, \sum_{i=1}^n m_i, \sum_{i=1}^n u_i) \quad (2)$$

and calculate the inverse of equation (2):

$$\left[\sum_{i=1}^n \sum_{j=1}^m M_{gi}^j \right]^{-1} = \left(\frac{1}{\sum_{i=1}^n u_i}, \frac{1}{\sum_{i=1}^n m_i}, \frac{1}{\sum_{i=1}^n l_i} \right) \quad (3)$$

Step 2: Calculating the degree of probability of $M_2 = (l_2, m_2, u_2) \geq M_1(l_1, m_1, u_1)$ is defined as follows:

$$V(M_2 \geq M_1) = \text{hgt}(M_1 \cap M_2) = \mu_{M_2}$$

Table 3. Triangular fuzzy number (TFN)

Intensity of Importance	Linguistic Scale	TFN	Inverse
1	Equally important	(1,1,3)	(1/3,1/1,1)
2	Intermediate (equally important)	(1,2,4)	(1/4,1/2,1)
3	Quite important	(1,3,5)	(1/5,1/3,1)
4	Intermediate (quite important)	(2,4,6)	(1/6,1/4,1/2)
5	Strong important	(3,5,7)	(1/7,1/5,1/3)
6	Intermediate (strong important)	(4,6,8)	(1/8,1/6,1/4)
7	Stronger important	(5,7,9)	(1/9,1/7,1/5)
8	Intermediate (stronger important)	(6,8,9)	(1/9,1/8,1/6)
9	Absolutely more important	(7,9,9)	(1/9,1/9,1/7)

Source: Liou & Chuang, (2010)

$$\begin{cases} 1, \text{ if } m_2 \geq m_1 \\ 0, \text{ if } l_1 \geq u_2 \\ \frac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)}, \end{cases} \quad (4)$$

where d is the ordinate of the highest point of intersection of D between μ_{M_1} and μ_{M_2} . For comparison, the two are calculated $V(M_2 \geq M_1)$ and $V(M_1 \geq M_2)$.

Step 3: If the probability degree for the convex fuzzy number is greater than the convex fuzzy number $M_i = (i = 1, 2, \dots, k)$, then the vector value can be defined as follows

$$\begin{aligned} V(M \geq M_1, M_2, \dots, M_k) &= V[(M \geq M_1) \text{ and} \\ (M \geq M_2) \text{ and } \dots \text{ and } (M \geq M_k)] &= \min V(M \geq M_i), \end{aligned} \quad (5)$$

$i = 1, 2, \dots, k$

Assume that

$$d'A_i = \min V(S_i \geq S_k) \quad (6)$$

For $k = 1, 2, \dots, n; k \neq i$. Then obtained the vector weight:

$$W' = (d'(A_1), d'(A_2), \dots, d'(A_n))^T, \quad (7)$$

where $A_i = 1, 2, \dots, n$ is n decision elements.

Step 4: Normalize the vector weight value so that the normalized vector weight value is obtained, namely: (W is a non-fuzzy number)

$$W = (d(A_1), d(A_2), \dots, d(A_n))^T \quad (8)$$

Calculation of the final priority weights conducts to determine the order of the criteria and sub-criteria. The final weight of the criteria is obtained by multiplying the criterion weight matrix with the dependency weight matrix between criteria. The calculation results are normalized to get the priority order of the criteria. The final weight is obtained by multiplying the weight of the sub-criteria and the weight of the criteria.

3. Results

3.1. SWOT analysis

A SWOT analysis was used to determine the barrier and driving factors and formulate a strategy for implementing a safe and halal school canteen. The SWOT questionnaire was distributed to the management, food handler of the high-school canteen and other respondents in Malang. The IFE matrix and EFE matrix results can be seen in Tables 4 and 5. Based on the IFE and EFE analysis matrix, an IE Matrix is formed in Figure 2.

The total scores for the IFE and EFE matrices are obtained at 2.827 and 3.037, respectively. The score of IFE and EFE matrices are between 1.0 to 4.0. The total score internal factors have a moderate effect on the position of the school canteen. In contrast, external factors strongly influence the position of the school canteen. An IE matrix is formed based on the total score of IFE (x-axis) and EFE (y-axis).

Based on the IE matrix, the position of the Senior High School canteen in Malang Regency is in cell IV. Quadrants I, II, and IV indicate the requirement for growth and development strategies (Setyorini et al., 2016). According to this condition, the strategy that can be applied are intensive, integrative, and concentration strategies. Intensive strategies (market penetration, market development, and product development) or integrative (backward integration, forward integration, and horizontal integration) strategies are best suited.

3.2. Alternative strategies

The SWOT matrix contains several alternative strategies that have been formulated from internal and external factors based on the position of the school canteen in the IE matrix, namely, grow and build strategy. Alternative strategies are developed through brainstorming with six expert respondents. Alternative strategies are categorized into 4, namely Strength—Opportunities (SO) strategy, Weakness—Opportunities (WO) strategy, Strength—Threat (ST) strategy, and Weakness—Threat (WT) strategy. The SWOT matrix can be seen in Table 6.

3.3. Fuzzy ANP

The strategy formulation in the SWOT Matrix was prioritized by weighting each strategy and sub-strategy using F-ANP. The F-ANP structure for implementing the strategy for Senior High School canteens in Malang Regency can be seen in Figure 3. The priority weights for each SWOT strategy are categorized SO, WO, ST, and WT. The priority weights for each strategy category are shown in Table 7.

The selected strategy supporting the implementation of safe and halal canteens is interpreted from the F-ANP weights for each sub-strategy weight and final weight. The highest weight in the SO sub-strategy is SO1 (0.680), developing a safe and halal school canteen considering affordable menu prices. This strategy uses the S1 and S3 factors to utilize the O1 and O2 factors. Therefore, the SO1 strategy implemented food safety and HAS and offered affordable prices according to student needs.

4. Discussion

4.1. Strength-weakness

Based on the results of the IFE matrix, the highest weight is obtained on the strength factor of 0.114. The internal factor is the school management's support for reopening canteens operations. Commitment and management are crucial aspects in supporting the state of the canteen. The school's top management (principal) commitment has proven to be the most vital driver for achieving safe and halal canteens (Febrihartanty et al., 2018). The aforementioned commitment can be implemented in policies (e.g., canteen regulations). In HAS 23000, top management commitment is an essential requirement in the implementation halal assurance system.

Table 4. IFE matrix

Internal Factor	Weight	Rating	Score
Strength			
S1: The price of the menu in the canteen is relatively affordable.	0.093	3	0.278
S2: The role of the school canteen as a supporter of the learning process.	0.110	4	0.439
S3: It has a big market share.	0.093	3	0.278
S4: School management support to reopen canteens operational.	0.114	4	0.456
Weakness			
W1: Lack of knowledge and skills in human resources regarding food safety & halal menu processing and serving.	0.105	2	0.211
W2: During the COVID-19 pandemic, consumers lacked confidence in the food products sold outside (including in schools).	0.084	2	0.169
W3: Restrictions Towards Community Activities (PPKM) and online schools during the COVID-19 pandemic made it difficult to carry out canteen management activities.	0.110	2	0.219
W4: Lack of commitment from the canteen management (managed by a single party and the absence of a regular management system).	0.097	2	0.194
W5: School canteen facilities and infrastructure are inadequate.	0.093	3	0.278
W6: The need for nutritional value is not sufficient.	0.101	3	0.304
Total	1.000		2.827

The lowest weight of the strength factor is obtained at 0.093; the price of the menu in the canteen is relatively affordable (S1) and has a big market share (S3). The fairly affordable prices are considered less influential in implementing a safe and halal school canteen. In addition, the big market share is also considered to be less influential. Karo and Hamonangan argue that purchasing power decreased during the COVID-19 pandemic (Karo & Hamonangan, 2021). Therefore, the significant market share does not influence the implementation of the school canteen.

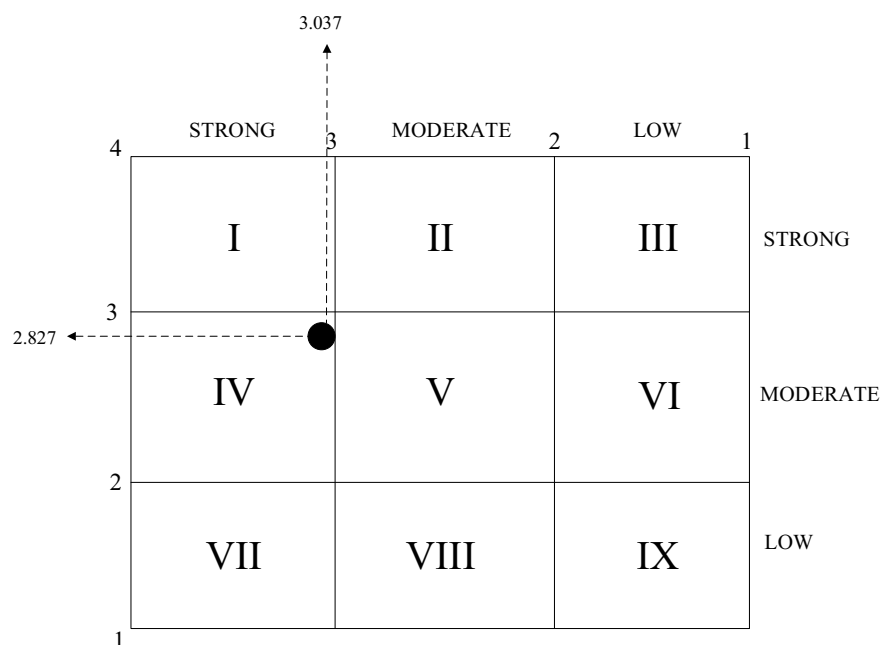
The highest weight of the weakness factor is obtained at 0.110, namely, the Restrictions Towards Community Activities (PPKM) regulation and online schools during the COVID-19 pandemic have made it difficult to carry out canteen management activities (W3). The food sector is the most

Table 5. EFE matrix

External Factors	Weight	Rating	Score
Opportunity			
O1: The existence of a safe and halal guaranteed canteen is still limited, so opportunities are more extensive.	0.106	3	0.318
O2: The demand for school canteens that are guaranteed safe and halal meets the latest regulations.	0.124	4	0.498
O3: Implementation of face-to-face learning in the new normal era.	0.111	4	0.442
O4: The importance of consuming safe food during the COVID-19 pandemic increases consumer demand for healthy food.	0.124	4	0.498
O5: The role of the school committee (parent/guardian association) in supporting the student learning process.	0.124	3	0.373
Threat			
T1: The acceptance of the school academic community toward safe and halal canteens is still limited, especially among students.	0.111	2	0.221
T2: Students prefer to buy food outside the school canteen.	0.088	3	0.263
T3: The COVID-19 pandemic has caused several food businesses to close (one of them is the canteen).	0.106	2	0.212
T4: Many choices of online food products outside of school.	0.106	2	0.212
Total	1.000		3.037

affected economic sector by the COVID-19 pandemic (Ezizwita & Sukma, 2021), one of which is the school canteen. According to the Four Ministerial Decree (*SKB Empat Menteri*) issued in March 2021, during the PPKM regulation, crowd-triggering activities such as canteens are still not allowed (Kementerian Pendidikan dan Kebudayaan, 2021). The condition hindered the school canteen operation. The school canteen needs to prepare control that adapts to the new normal era, especially when the online learning activities were gradually decreased. Canteen operations are starting to open in the new normal era. Therefore, schools need to be committed to carrying out canteen operations by ensuring strict implementation of COVID-19 protocols (Direktorat Sekolah Menengah Atas, 2020). The main point that should be considered in the canteen during the pandemic operation: COVID-19 is still not claimed to be transferred through food (World Health Organization, 2020). The food handler suggests exercising proper hygiene. Anyone with signs of

Figure 2. IE matrix.



respiratory infection should refrain from cooking food and comply with social distancing regulations. The self-service operation has become one of the best options related to the physical distancing regulations by considering the maximum person capacity, hygiene measures, and cashless payment (BSHS P&C Association Canteen, 2021).

The lowest weight of the weakness factor is obtained at 0.084; namely, during the COVID-19 pandemic, consumers lacked confidence in the food products sold outside (one of them is in schools). These factors are considered less influential in implementing halal and safe canteens. However, the safe and halal canteen as a food provider is still required as mandatory regulation in Indonesia. The Directorate of Senior High School of Ministry of Education, Culture, Research and Technology stated that the school canteen also has a critical function to provide and ensure food safety for all school academia. Teachers and students really need food while at school. The presence of the canteen controls the provision of safe food for the school's academic community (Direktorat Sekolah Menengah Atas, 2020).

4.2. Opportunity-threat

Based on the results of weighting using the EFE matrix, the highest weight of the opportunity factor of 0.124. These factors are the demand to provide school canteens that are guaranteed safe and halal according to the latest regulations, the importance of consuming safe food during the COVID-19 pandemic, increasing consumer demand for safe food (O4), and the role of school committees in supporting the student learning process (O5). These factors are considered significant opportunities for implementing safe and halal canteens. Regulations that support the implementation of safe and halal canteens are as follows (Direktorat Sekolah Menengah Atas, 2020; Sucipto et al., 2021):

- (1) Regulation of Ministry of Health Decree No. 942 of 2003 concerns guidelines for the requirements for sanitation of snack food.
- (2) Regulation of Ministry of Health Decree No. 1429 of 2006 concerns guidelines for implementing school environmental health.
- (3) Regulation of Ministry of Education and Culture No. 57 of 2009 concerning the provision of assistance for the development of healthy schools.

Table 6. SWOT matrix for reopening school canteen in new normal era

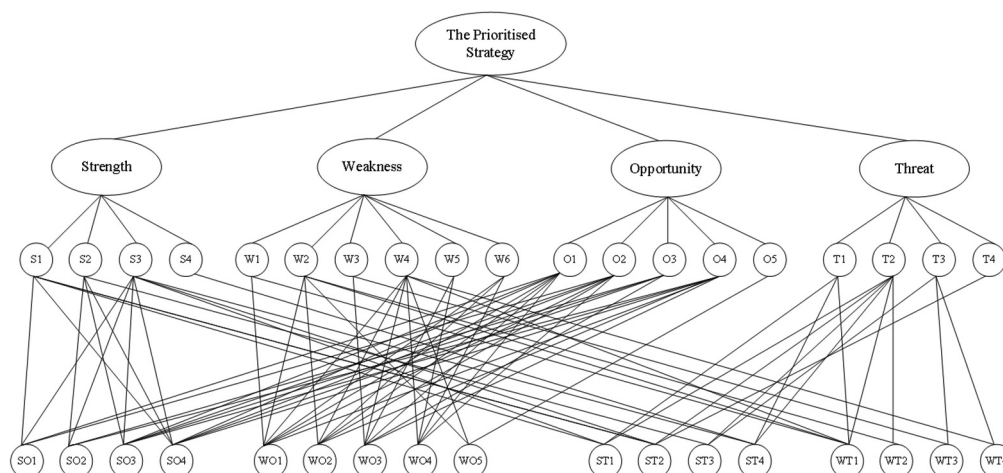
External	Internal	Strengths (S)	Weaknesses (W)
		(1) S1: The price of the menu in the canteen is relatively affordable. (2) S2: The role of the school canteen as a supporter of the learning process. (3) S3: It has a big market share. (4) S4: School management support to reopen canteen's operational.	(1) W1: Lack of knowledge and skills in human resources regarding food safety & halal menu processing and serving. (2) W2: During the COVID-19 pandemic, consumers lacked confidence in the food products sold outside (including in schools). (3) W3: Restrictions Towards Community Activities (PPKM) and online schools during the COVID-19 pandemic have made it difficult to carry out canteen management activities. (4) W4: Lack of commitment from the canteen management (managed by a single party and the absence of a regular management system). (5) W5: School canteen facilities and infrastructure are inadequate. (6) W6: The need for nutritional value is not sufficient.
Opportunities (O)		SO Strategies	WO Strategies
(1) O1: The existence of a safe and halal guaranteed canteen is still limited so opportunities are more extensive. (2) O2: The demand to provide school canteens that are guaranteed safe and halal according to the latest regulations. (3) O3: Implementation of Face-to-face Learning (PTM) in the new normal era. (4) O4: The importance of consuming safe food during the COVID-19 pandemic increases consumer demand for healthy food. (5) O5: The role of the school committee (parent/guardian association) in supporting the student learning process.		(1) SO1: Develop safe and halal school canteens considering affordable menu prices (S1,3-O1,2). (2) SO2: Implementing procedures for reopening school canteens by considering COVID-19 protocols (social distancing, hand washing, serving regulations) and improving the canteen supporting facilities, and re-arranging the layout considering COVID-19 protocols (S2,3-O3,4). (3) SO3: Re-formulating the menu considering food safety and halal (taking into account the use of raw materials, additives, and food processing) (S2,3-O1,2,3,4). (4) SO4: Conducting healthy, safe, and halal canteen management training for the responsible parties (school principals, teachers, canteen managers, and food handlers) (S1,2,3-O1,2,3,4).	(1) WO1: Conduct training on processing and serving safe and halal menus for canteen managers and food handlers (W1,2,4,6-O1,2,4). (2) WO2: Evaluate and re-formulate the menus (if there are ingredients that do not meet the safety and halal requirements) and apply Good Ready-to-Serve Food Production Methods (CPPSSB) (W2,4,6-O1,2,4). (3) WO3: Prepare the supporting infrastructure and study the procedures for reopening the school canteen (W3,4,5-O1,3,4). (4) WO4: Periodic supervision is needed to develop school canteen management by the Public Health Office or private institution (only for private schools) (W4,5,6-O1,2). (5) WO5: Involving the school committee in the management of the canteen (W2,4-O5).

(Continued)

Table 6. (Continued)

Threats (T)	ST Strategies	WT Strategies
<p>(1) T1: The acceptance of the school academic community toward safe and halal canteens is still limited, especially among students.</p> <p>(2) T2: Students prefer to buy food outside the school canteen.</p> <p>(3) T3: The COVID-19 pandemic has caused several food businesses to close (one of them is the canteen).</p> <p>(4) T4: Many choices of online food products outside of school.</p>	<p>(1) ST1: Serving a variety of safe and halal menus according to the purchasing power of the school's academic community, especially students (S1,3-T1,2).</p> <p>(2) ST2: Identify student's favourite snacks to re-formulate new menus that are safer and more halal following food trends outside of school (S1,3-T2,4).</p> <p>(3) ST3: Reopen the canteen by implementing the procedure for opening the school canteen during the new habit period (taking into account the time limit and shift system for canteen workers or employees) (S2-T2,3).</p> <p>(4) ST4: Increase student's awareness of safe and halal food through the learning process (S2,4-T1,2).</p>	<p>(1) WT1: Conduct education according to the needs of school academia, for example, the fundamentals of food safety and halal assurance system (students, teachers, and school principals) and healthy, safe, and halal canteen management procedures (canteen managers and food handlers) (W1,2,4-T1,2).</p> <p>(2) WT2: Develop new menus or re-formulation of existing menus (considering academia's tastes and selection of materials and processes that ensure food safety, halal, and nutrition) (W2-T2).</p> <p>(3) WT3: Implement a shift system for tenants (for example, tenant A: Monday, tenant B: Tuesday, etc.) (W3-T3).</p> <p>(4) WT4: Establish a commitment to managing healthy, safe, and halal canteens continuously with discussions and communication between responsible parties (W4-T3).</p>

Figure 3. The fuzzy-ANP network structure for reopening school canteen in a new normal era.



- (4) Government Regulation of the Republic Indonesia No. 19 of 2005 concerns national education standards, every education unit support with adequate facilities and infrastructure, including a canteen.

Table 7. Priority strategy weighting									
Strategy Weight			Sub-strategies Weight				Final Weight		
Strategy	Weight (ANP)	Weight (F-ANP)	Sub-strategy	Weight (ANP)	Weight (F-ANP)	Weight (ANP)	Ranking	Weight (F-ANP)	Ranking
SO	0.230	0.256	SO1	0.654	0.680	0.150	2	0.174	2
			SO2	0.110	0.144	0.025	11	0.037	9
			SO3	0.095	0.072	0.022	13	0.018	16
			SO4	0.141	0.104	0.033	10	0.027	14
WO	0.186	0.213	WO1	0.355	0.251	0.066	5	0.053	6
			WO2	0.214	0.220	0.040	8	0.047	8
			WO3	0.255	0.227	0.047	7	0.048	7
			WO4	0.109	0.168	0.020	14	0.036	10
ST			WO5	0.068	0.134	0.013	17	0.029	13
	0.159	0.170	ST1	0.654	0.562	0.104	3	0.096	3
			ST2	0.110	0.156	0.018	15	0.027	15
			ST3	0.095	0.098	0.015	16	0.017	17
WT			ST4	0.141	0.184	0.023	12	0.031	11
	0.425	0.361	WT1	0.193	0.263	0.082	4	0.095	4
			WT2	0.119	0.156	0.050	6	0.056	5
			WT3	0.094	0.083	0.040	9	0.030	12
Total			WT4	0.594	0.499	0.252	1	0.180	1
	1	1				1		1	

- (5) Government Regulation of the Republic Indonesia No. 31 of 2019 related to implementing laws Number 33 of 2014 concerning Halal Product Guarantee (HPG) states that products that enter, circulate, and are traded in Indonesia must be halal certified.

The lowest opportunity factor weight is obtained at 0.106 means the existence of a safe and halal guaranteed canteen is still limited, so opportunities are more extensive. These factors are considered less influential as an opportunity to implement the school canteen.

The highest weight of the threat factor is obtained at 0.111, the acceptance of school academics, especially students, towards safe and halal canteens is still limited. These factors have a significant influence as a threat to implementing a safe and halal canteen. The challenges of the halal industry are a low number of halal-certified products, which indicates the HAS is not optimal in HPG services (Sukoso et al., 2020). The human resources for halal understanding in the canteen business are still limited. Therefore, education programs such as socialization or training are essential to increase the awareness and insight of the school's academic community.

The lowest weight of the threat factor is 0.088, students sometimes prefer to buy snacks outside the school canteen. These factors are considered not to be a threat to the implementation of a halal and safe canteen. This condition shows that the school canteen management has been committed to providing safe and halal food in schools. Commitment can be realized through written commitments such as canteen regulations prohibiting students from buying snacks outside of school during study hours or breaks (Direktorat Sekolah Menengah Atas, 2020). The factors of student's tendency to purchase snacks outside of school obtained low contribution, so it was considered less influential (Sari, 2017).

4.3. Alternative strategies

Identical school canteens offer affordable prices according to student's financial capabilities (Prasetya, 2019). The continuity of food safety and halal assurance is urgent. Galabo (2019) examined the relationship between service quality and canteen consumer satisfaction, with affordable prices as a crucial factor that can significantly increase customer satisfaction. The recommended strategy is for the school administration or canteen manager to review costs. The other critical factors that need to be studied in improving canteen services are nutritional needs, facilities, cleanliness, and sanitation (Galabo, 2019). Abdullah et al. also consider affordable prices and the ability to serve halal and quality menus to improve service quality and achieve customer satisfaction (Abdullah et al., 2018).

The highest weight at the WO sub-strategy is WO1 (0.251), conducting training on processing and serving safe and halal menus for Senior High School canteen managers and food handlers. This strategy minimizes the weakness of W1, W2, W4, and W6 by taking advantage of the opportunity of O1, O2, and O4. Therefore, implementing this strategy in training aims to improve the knowledge, skills, and attitudes of canteen managers in controlling safe and halal menus. According to the Directorate of Senior High School (Direktorat Sekolah Menengah Atas, 2020), in constructing a healthy school canteen, it is vital to study guidelines for healthy canteens that meet standards and organize training for canteen managers and food handlers. Training can collaborate with the Public Health Office, Food and Drug Administration, and Universities. Food business managers and handlers who receive training commit to improving safe and halal food assurance (Faida et al., 2018). Education on food safety and health raises awareness to reduce the risk of food processing and serving. Food handler's attitudes significantly influence safe food handling (Aziz & Dahan, 2013).

The highest weight in the ST sub-strategy is ST1 (0.562), which serves a variety of safe and halal menus that meet the purchasing power of the school's community, especially students. This strategy takes advantage of the strengths of S1 and S3 to face the threats of T1 and T2. ST1 strategy was developed by servicing various safe and halal menus to encourage student's interest in menus in the school canteen. Students tend to like food or drinks suitable for current trends. Reviewing the variety of menus according to the purchasing power of students can be considered school canteen management. World Health Organization (WHO) categorized the menus sold in healthy canteens: the green category (must-have menu/recommended menu), the amber category (the menu that needs to be chosen carefully), and the red category (not recommended menu). The green category is the best menu choice for school canteens that guarantees the fulfilment of children's nutrition (low saturated fat, low sugar, and low sodium) (World Health Organization, [n.d.](#)). These menus cluster are always served daily, varied, attractively presented, and considered in good taste. Almatier et al. (2017) state that students choosing a food menu are influenced by knowledge and other factors such as childhood habits, current trends, religion/belief, financial ability, advertising, and myths about food

The highest weight in the WT sub-strategy is WT4 (0.499), which establishes a commitment to continuously managing healthy, safe, and halal canteens with the discussion between responsible parties. This strategy was formulated to minimize weakness in W4 to overcome the threat of T3. It is essential to implement this strategy by establishing a joint commitment from various parties. Commitment from multiple parties is needed to establish strong authority for realizing a healthy school canteen (Direktorat Sekolah Menengah Atas, 2020). Implementing a safe and halal canteen cannot be separated from communication, coordination, and cooperation of various parties and the school community's awareness. These parties include school principals, teachers, canteen managers, food handlers, and school committees (if involved). School committees pay attention to the consumption needs of students according to nutrition, balance, and religious beliefs. All parties are committed to implementing canteens according to food safety and halal standards by preparing, processing, and serving safe and halal menus. External parties such as the government, universities, and public health offices can support implementing a healthy school canteen (Febrihartanty et al., 2018). Various parties must consistently communicate, coordinate, cooperate, and commit to planning and implementing safe and halal food. The school principal is crucial in developing a communication forum for various parties.

4.4. Strategy priority

Based on priority strategy weighting, the rank is the same between ANP weight and F-ANP weight, only from 1 to 5. This study focuses on the F-ANP weight, the final weight of the strategy sequentially from highest to lowest are WT4, SO1, ST1, WT1, WT2, WO1, WO3, WO2, SO2, WO4, ST4, WT3, WO5, SO4, ST2, SO3, and ST3. The six recommended strategies are WT4, SO1, ST1, WT1, WT2, and WO1.

WT4 strategy, establishing a commitment to continuously managing healthy, safe, and halal canteens through communication between responsible parties, is the most important strategy to implement. This commitment is crucial to planning, preparing, and implementing the safe and halal canteen for Senior High Schools in Malang City. Commitment from various parties is built through coordination, discussion, cooperation, and communication. These results are consistent with the research by Faour-Klingbeil et al. (2022), that public communication strategies on health and food safety in the Middle East and North Africa to build and maintain public trust. Then strategies are SO1 developing safe and halal school canteens considering affordable menu prices and ST1 serving safe and halal menu variations to meet the purchasing power of school academics. These two strategies are essential and interrelated. The school canteen's target is to fulfil students' nutritional and spiritual of students by providing safe and halal food. Moreover, the ensure is not only safe and halal food but also affordable prices that meet students' purchasing power. Menu variations also need to be considered to avoid student's satiation with the same menu and prevent students from snacking outside of school.

Then, the WT1 strategy is to conduct education according to the school academia's needs. For example, basic food safety and halal assurance system training are undertaken for students, teachers, and school principals. Besides, healthy, safe, halal, and management training is needed for canteen managers and food handlers. During the COVID-19 pandemic, many educations were carried out through webinars. Through education, school academics, canteen managers, and food handlers can improve their competence, increase awareness, commit to establishing safe and halal canteens. Prior research noted that training on food hygiene and safety influences the knowledge and practice of food handlers (Lestantyo et al., 2017; Sharif et al., 2013; Teferi et al., 2021). Food handlers have attitudes that significantly influence safe food handling in the Malaysian school canteen (Aziz & Dahan, 2013).

WT2 strategy related to ST1 is developing new menus or re-formulating existing menus (considering student's tastes and selecting ingredients and processes that ensure food safety, halal, and nutrition). This strategy is the embodiment of the ST1 strategy planning (menu variation, if the previous menu is deemed not to meet the standards of safe and halal assurance, it is vital to apply a re-formulation. The urgency to review school canteen menus to support nutrient and healthy meals (González et al., 2021; Lavall et al., 2020). This condition also accords with recent research based on a case study in the Universitas Brawijaya (UB) library canteen in Indonesia, the new menu development procedure is carried out with the tenant's proposal to the canteen management. The canteen management evaluates the new menu and then offers the halal certification to the certification agency (Sucipto et al., 2021). Therefore, the school canteen needs to form a halal internal management team to assess menu development.

The last WO1 strategy conducts training on processing and serving safe and halal menus for canteen managers and food handlers. This strategy has the same context and is related to the WT1 strategy. The training increases knowledge, attitude, and practices in producing and serving a safe and halal school canteen.

4.5. Implication to school canteen managerial

The implications include learning the procedures of reopening the school canteen in a new normal era established for academic school communities. WHO and Food and Agriculture Organization (FAO) of the United Nations state that it is necessary to follow the guidelines by maintaining public health standards for hand washing and respiratory etiquette, maintaining a physical distance, limiting physical contact, promoting hand hygiene and physical distancing by staff, and performing disinfection procedures (World Health Organization and Food and Agriculture Organization of the United Nations, 2020). In addition, following the proper canteen guidelines, the canteen must also pay attention to the menu and serving options suitable for protocols Covid-19. The canteen should consider opening options (open based on consumer demands), communication, and menu options (reducing the menu option temporarily and offering a menu with less direct food handling) (Fuel to Go, 2021). Reducing the menu aids in assessing the situation, reducing waste, and reducing staff in the canteen (Bunbury Cathedral Grammar School, 2020). The menu needs to contribute quality and safety standards of food and acceptable nutrition to maintain a healthy and balanced diet for students while helping to improve the local economy (United Nations Children's Fund, 2020). Ingrassia et al. (2020), address ten tips and recommendations for the safe reopening of food provision. First, there are redesigned facilities (layout and area management in reducing crowds and maintaining social distance). The simulation facility is limited to the following terms and conditions, prepare personal hygiene and protective equipment, effective surgical mask, gloves, goggles, waterproof coat, etc. Then, physical distancing management at least 1 meter, staff management, cleaning and disinfection, creating a simulation to identify the errors, management of human resources, material and equipment, financial review, and the final emergency plan and strategies review.

Based on the research result and references, several aspects must be prepared to reopen the school canteens in a new normal era, namely: repairing facilities according to COVID-19 protocols, improving the canteen layout, preparing hand washing and disinfection facilities, preparing PPE for food handlers, implementing a shift system to avoid crowds, review menus safe and halal, and conduct management reviews. The management's commitment is essential for consistently implementing safe and halal canteens according to COVID-19 protocols. Implementing selected strategies to reopen the school canteen in the new normal.

5. Conclusion

Implementing a safe and halal to reopening the senior high school canteen in Malang needs growth and development strategies. Based on priority strategies are recommended six strategies: 1) Establish a commitment to continuously managing healthy, safe, and halal school canteens with communication between responsible parties; 2) Develop school canteens that consider affordable menu prices; 3) Give serving a variety of safe and halal menus according to the buying power, especially students; 4) Educate or give training on basics of food safety and halal assurance for school academia; 5) Develop new menus or reformulate existing menus to consider academia's tastes and support food safety, halal, and nutrition; 6) Give training on processing and serving safe and halal menus for school canteen managers and food handlers. The most critical element is the commitment to consistently implement safe and halal canteens according to new normal era protocols. The proposed strategies can be associated with prepared aspects for reopening school canteens in the new normal era.

Funding

This study received funding from the Southeast Asian Ministers of Education Organization Regional Centre for Food and Nutrition (SEAMEO RECFON) in 2021 under Grant [No. 304/PPK/SEAMEO RECFON/III/2021].

Author details

Sucipto Sucipto^{1,2}
E-mail: ciptotip@ub.ac.id
ORCID ID: <http://orcid.org/0000-0002-2450-1542>
Titis Sari Kusuma³
Khothibul Umam Al Awwaly⁴
Muhammad Arwani¹
Luki Hidayati¹
Judhiastuty Februhartanty⁵

¹ Department of Agroindustrial Technology, Faculty of Agricultural Technology, Universitas Brawijaya, Malang, Indonesia.

² Halal-Qualified Industry Development (Hal-Q ID), Universitas Brawijaya, Malang, Indonesia.

³ Department of Nutrition Science, Faculty of Health Science, Universitas Brawijaya, Malang, Indonesia.

⁴ Department of Animal Product Technology, Faculty of Animal Science, Universitas Brawijaya, Malang, Indonesia.

⁵ Southeast Asian Ministers of Education Organization Regional Centre for Food and Nutrition (SEAMEO RECFON)/Pusat Kajian Gizi Regional, Universitas Indonesia, Jakarta, Indonesia.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Author's contributions

The research idea was developed by Sucipto Sucipto, Titis Sari Kusuma, and Khothibul Umam Al Awwaly. The research was conducted by Sucipto Sucipto, Titis Sari Kusuma, Khothibul Umam Al Awwaly, Muhammad Arwani, and Luki Hidayati. This manuscript was written and edited by Sucipto Sucipto, Muhammad Arwani, and Luki Hidayati. Judhiastuty Februhartanty monitored and offered advice on this manuscript.

Data availability statement

Data are available upon request from the corresponding author

Ethical approval

This study protocol was approved by the Health Research Ethics Committee, Faculty of Medicine, Universitas Brawijaya, through Ethical Approval Letter No. 237/EC/KEPK/08/2021.

Citation information

Cite this article as: Strategy mapping for reopening school canteen in new normal era by safety and halal standard, Sucipto Sucipto, Titis Sari Kusuma, Khothibul Umam Al Awwaly, Muhammad Arwani, Luki Hidayati & Judhiastuty Februhartanty, *Cogent Food & Agriculture* (2023), 9: 2248700.

References

- Abdullah, D., Hamir, N., Nor, N. M., Jayaraman, K., & Rostum, A. M. M. (2018). Food quality, service quality, price fairness and restaurant re-patronage intention: The mediating role of customer satisfaction. *The International Journal of Academic Research in Business & Social Sciences*, 8(17), 211–226. <https://doi.org/10.6007/IJARBS/v8-i17/5226>
- Aghasafari, H., Karbasi, A., Mohammadi, H. & Calisti, R. (2020). Determination of the best strategies for development of organic farming: A SWOT – Fuzzy Analytic Network Process approach. *Journal of Cleaner Production*, 277, 124039. <https://doi.org/10.1016/j.jclepro.2020.124039>
- Allata, S., Valero, A., & Benhadja, L. (2017). Implementation of traceability and food safety systems (HACCP) under the ISO 22000: 2005 standard in North Africa: The case study of an ice cream company in Algeria. *Food Control*, 79, 239–253. <https://doi.org/10.1016/j.foodcont.2017.04.002>
- Almatsier, S., Soetardjo, S., & Soekatri, M. (2017). *Gizi seimbang dalam daur hidup kehidupan*. Gramedia Pustaka Utama.

- Arif, S. (2011). Food quality standards in developing quality human capital: An Islamic perspective. *African Journal of Business Management*, 5(31), 12242–12248. <https://doi.org/10.5897/ajbm10.1692>
- Aziz, S. A. A., & Dahan, H. M. (2013). Food handlers' attitude towards safe food handling in school canteens. *Procedia - Social & Behavioral Sciences*, 105, 220–228. <https://doi.org/10.1016/j.sbspro.2013.11.023>
- BSHS P&C Association Canteen. (2021). *Canteen operations during COVID-19 pandemic*. <https://brisbaneshs.eq.edu.au/supportandresources/formsanddocuments/documents/facilities/canteen/canteen-operations-plan-covid-19.pdf>
- Budiono, G. L. (2017). Mapping and selecting company's competitive strategy. *European Research Studies Journal*, 20(Issue 4A), 696–706. <https://doi.org/10.35808/ersj/865>
- Bunbury Cathedral Grammar School. (2020). *Canteen COVID-19 procedures*. Bunbury Cathedral Grammar School.
- Chang, D. (1996). Applications of the extent analysis method on fuzzy AHP. *European Journal of Operational Research*, 95(3), 649–655. [https://doi.org/10.1016/0377-2217\(95\)00300-2](https://doi.org/10.1016/0377-2217(95)00300-2)
- Dağdeviren, M., & Yüksel, I. (2010). A fuzzy analytic network process (ANP) model for measurement of the sectoral competition level (SCL). *Expert Systems with Applications*, 37(2), 1005–1014. <https://doi.org/10.1016/j.eswa.2009.05.074>
- Direktorat Sekolah Menengah Atas. (2020). *Kantin sehat SMA di masa kebiasaan baru*. Kementerian Pendidikan dan Kebudayaan.
- Ezizwita, E., & Sukma, T. (2021). Dampak pandemi COVID-19 terhadap bisnis kuliner dan strategi beradaptasi di Era New Normal. *Jurnal Ekonomi dan Bisnis Dharma Andalas*, 23(1), 51–63. <https://doi.org/10.47233/jebd.v23i1.169>
- Faida, R., Zabidi, A., & Jamaludin, M. (2018). The validation of halal awareness and halal practice instrument among halal restaurant food handlers. *Article in Asian Journal of Social Sciences & Humanities*, 1(3), 2600–9056. <https://doi.org/10.26666/rmp.jssh.2018.3.1>
- Faour-Klingbeil, D., Osaili, T. M., Al-Nabulsi, A. A., O'Taybeh, A., Jemni, M., & Todd, E. C. D. (2022). How has public perception of food safety and health risks changed a year after the pandemic and vaccines rollout? *Food Control*, 139, 109073. <https://doi.org/10.1016/j.foodcont.2022.109073>
- Febrihantanty, J., Iswarawanti, D. N., Ermayan, E., Meiyyetrian, E., Pramesthi, I. L., Astuti, R. D. (2018). *Petunjuk praktis pengembangan kantin sehat sekolah*. Southeast Asian Ministers of Education Organization, Regional Centre for Food and Nutrition (SEAMEO RECFON). 978-602-60639-3-9. <https://repositori.kemdikbud.go.id/21019/1/Modul-Kantin-Sehat-Sekolah.pdf>
- Fitriani, D. A. UIN Sunan Ampel Surabaya. (2020). Strategi pengembangan ekonomi kreatif di lingkungan pondok pesantren Al-Mashduqiah Desa Patokan Kecamatan Kraksaan Kabupaten Probolinggo dalam perspektif ekonomi islam. (UIN Sunan Ampel Surabaya). Accessed 12 January 2023. <http://digilib.uinsa.ac.id/45303/>
- Food Standard Agency. (2020). *Reopening checklist for food businesses during Covid-19*. Food Standard Agency. <https://www.food.gov.uk/document/reopening-checklist-for-food-businesses-during-covid-19-form>
- Fuel to Go. (2021). Reopening your canteen. *Fuel to Go & Play*. <https://www.fuelto.go.com.au/>
- Galabo, N. R. (2019). Canteen service quality and student satisfaction. *International Journal of Scientific and Technology Research*, 8(6), 114–126. 2277-8616. <https://www.ijstr.org/paper-references.php?ref=IJSTR-0619-20479>
- González, M. Á. S. J., Baviera, L. C. B., & Moreno-Villares, J. M. (2021). School lunch menus in Spain: A review on recommendations and policy. *Anales de pediatria*, 95(1), e55.1–e55.9. <https://doi.org/10.1016/j.anpede.2021.01.006>
- Ingrassia, P. L., Capogna, G., Diaz-Navarro, C., Szyld, D., Tomola, S., & Leon-Castelao, E. (2020). Covid-19 crisis, safe reopening of simulation centres and the new normal: Food for thought. *Advances in Simulation*, 5(1), 1–14. <https://doi.org/10.1186/s41077-020-00131-3>
- Irawan, M. Z., Rizki, M., Joewono, T. B., & Belgiawan, P. F. (2020). Exploring the intention of out-of-home activities participation during new normal conditions in Indonesian cities. *Transportation Research Interdisciplinary Perspectives*, 8(May), 100237. <https://doi.org/10.1016/j.trip.2020.100237>
- Karo, P. K., & Hamonangan, S. (2021). Analisis strategi pemasaran restoran menghadapi masa pandemi COVID-19 di Kota Pagar Alam. *Jurnal Sains Sosio Humaniora*, 5(1), 396–408. <https://doi.org/10.22437/jssh.v5i1.14152>
- Kementerian Pendidikan dan Kebudayaan. (2021). *Satuan pendidikan di wilayah PPKM Level 1-3 dapat melaksanakan PTM terbatas*. <https://www.kemdikbud.go.id/main/blog/2021/08/satuan-pendidikan-di-wilayah-ppkm-level-13-dapat-laksanakan-ptm-terbatas>
- Khan, M. I. (2018). Evaluating the strategies of compressed natural gas industry using an integrated SWOT and MCDM approach. *Journal of Cleaner Production*, 172, 1035–1052. <https://doi.org/10.1016/j.jclepro.2017.10.231>
- Lavall, M. J., Blesa, J., Frigola, A., & Esteve, M. J. (2020). Nutritional assessment of the school menus offered in Spain's Mediterranean area. *Nutrition*, 78, 110872. <https://doi.org/10.1016/j.nut.2020.110872>
- Lestantyo, D., Husodo, A. H., Iravati, S., & Shaluhayah, Z. (2017). Safe food handling knowledge, attitude and practice of food handlers in hospital kitchen. *International Journal of Public Health Science (IJPHS)*, 6(4), 324. <https://doi.org/10.11591/ijphs.v6i4.10778>
- Liou, J. J., & Chuang, M. (2010). Evaluating corporate image and reputation using fuzzy MCDM approach in airline market. *Qual Quant*, 44(6), 1079–1091. <https://doi.org/10.1007/s11135-009-9259-2>
- Mohanty, R. P., Agarwal, R., Choudhury, A. K., & Tiwari, M. K. (2005). A fuzzy ANP-based approach to R&D project selection: A case study. *International Journal of Production Research*, 43(24), 5199–5216. <https://doi.org/10.1080/00207540500219031>
- Mukeshimana, M. C., Zhao, Z. Y., & Nshimiyimana, J. P. (2021). Evaluating strategies for renewable energy development in Rwanda: An integrated SWOT – ISM analysis. *Renewable Energy*, 176, 402–414. <https://doi.org/10.1016/j.renene.2021.05.104>
- Nizam, N. Z., Supaat, S. H., & Masrom, N. R. (2019). Sustainability and future challenges of halal product consumption. *International Journal of Human and Technology Interaction*, 3(2), 61–68, 2590-3551. <https://journal.utm.edu.my/index.php/ijhati/article/view/5494/0>
- Nurmaydha A., Mustaniroh, S. A., & Sucipto, S. (2019). Strategi pengembangan restoran halal sebagai penunjang hotel syariah (studi kasus di Unida Gontor Inn, Universitas Darussalam Gontor Ponorogo). *Dinar*

- Jurnal Ekonomi dan Keuangan Islam*, 5(2), 71–82, <https://doi.org/10.21107/dinar.v5i2.5006>
- Nurrachmi, R. (2017). The global development of halal food industry: A survey. *Tazkia Islamic Finance and Business Review Volume*, 11(1), 39–56. <https://doi.org/10.30993/tifbr.v11i1.113>
- Osimani, A., Aquilanti, L., & Clementi, F. (2015). Evaluation of HACCP system implementation on the quality of mixed fresh-cut salad prepared in a university canteen: A case study. *Journal of Environmental Health*, 77(6), 78–85, PMID: 25619040. <https://pubmed.ncbi.nlm.nih.gov/25619040/>.
- Osimani, A., Aquilanti, L., Tavoletti, S., & Clementi, F. (2013). Evaluation of the HACCP system in a university canteen: Microbiological monitoring and internal auditing as verification tools. *International Journal of Environmental Research and Public Health*, 10(4), 1572–1585. <https://doi.org/10.3390/ijerph10041572>
- Osimani, A., Milanović, V., Aquilanti, L., Polverigiani, S., Garofalo, C., & Clementi, F. (2018). Hygiene auditing in mass catering: A 4-year study in a university canteen. *Public Health*, 159, 17–20. <https://doi.org/10.1016/j.puhe.2018.03.015>
- Prasetya, E. (2019). Personal hygiene penjamah makanan dan sanitasi kantin sekolah di wilayah kerja Puskesmas Duinggi. *Sulolipu: Media Komunikasi Sivitas Akademika dan Masyarakat*, 18(1), 1–8. <https://doi.org/10.32382/sulolipu.v18i1.735>
- Pujiono, A., Setyawati, R., & Idris, I. (2018). Strategi pengembangan UMKM halal di Jawa Tengah dalam menghadapi persaingan global. *Indonesia Journal of Halal*, 1(1), 1–7, <https://doi.org/10.14710/halal.v1i1.3109>
- Sari, S. G. P. (2017). Analisis faktor-faktor kebiasaan siswa membeli jajanan di Sekolah. *JMSP: Jurnal Manajemen dan Supervisi Pendidikan*, 2(1), 33–40. <https://doi.org/10.17977/um025v2i12017p033>
- Setyorini, H., Effendi, M., & Santoso, I. (2016). Analisis strategi pemasaran menggunakan Matriks SWOT dan QSPM (Studi Kasus: Restoran WS Soekarno Hatta Malang). *Industria: Jurnal Teknologi dan Manajemen Agroindustri*, 5(1), 46–53. <https://doi.org/10.21776/ub.industria.2016.005.01.6>
- Sevcli, M., Oztekin, A., Uysal, O., Torlak, G., Turkyilmaz, A., & Delen, D. (2012). Development of a fuzzy ANP based SWOT analysis for the airline industry in Turkey. *Expert Systems with Applications*, 39(1), 14–24. <https://doi.org/10.1016/j.eswa.2011.06.047>
- Sharif, L., Obaidat, M. M., & Al-Dalalah, M.-R. (2013). Food hygiene knowledge, attitudes and practices of the food handlers in the military hospitals. *Food and Nutrition Sciences*, 04(3), 245–251. <https://doi.org/10.4236/fns.2013.43033>
- Sucipto, S., Hidayati, L., Perdani, C. G., & Hasanah, N. (2021). Traceability of halal control point in material, production, and serving to support halal certification in Universitas Brawijaya canteen. *Indonesian Journal of Halal Research*, 3(2), 75–86. <https://doi.org/10.15575/ijhar.v3i2.11401>
- Sucipto, S., Rahman, F. S., & Mustaniroh, S. A. (2018). Analisis penilaian konsumen terhadap kinerja kantin perguruan tinggi. *Industria: Jurnal Teknologi dan Manajemen Agroindustri*, 7(2), 95–106. <https://doi.org/10.21776/ub.industria.2018.007.02.4>
- Sukoso, Wiryawan, A., Kusnadi, J., & Sucipto, S. (2020). *Ekosistem industri halal*. Departemen Ekonomi dan Keuangan Syariah - Bank Indonesia. 978-602-60042-5-3. <https://www.bi.go.id/id/edukasi/Pages/Buku-Ekosistem-Industri-Halal.aspx>
- Teferi, S. C., Sebsibe, I., Adibaru, B., & Al-Khatib, I. (2021). Food safety practices and associated factors among food handlers of Fiche Town, North Shewa Zone, Ethiopia. *Journal of Environmental and Public Health Article ID 6158769*, 2021, 1–7. <https://doi.org/10.1155/2021/6158769>
- Umar, H. (2008). *Management strategy in action*. Gramedia Pustaka Utama.
- United Nations Children's Fund. (2020). *Guidance Notes on Reopening Schools in the Context of COVID-19 for Ministries of Education in Latin America and the Caribbean*. <https://www.unicef.org/lac/en/media/14696/file>
- Wallace, C. A., Holyoak, L., Powell, S. C., & Dykes, F. C. (2014). HACCP - The difficulty with hazard analysis. *Food Control*, 35(1), 233–240. <https://doi.org/10.1016/j.foodcont.2013.07.012>
- Wallace, C. A., Powell, S. C., & Holyoak, L. (2005). Post-training assessment of HACCP knowledge: Its use as a predictor of effective HACCP development, implementation and maintenance in food manufacturing. *British Food Journal*, 107(10), 743–759. <https://doi.org/10.1108/00070700510623522>
- World Health Organization. (2020). *Coronavirus Disease (Covid-19): Food Safety and Nutrition*. <https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-covid-19-food-safety-and-nutrition>
- World Health Organization. (n.d.). *Policy - Guidelines for Healthy Foods and Drinks Supplied in School Canteens*. 2012. Retrieved November 12, 2021, from <https://extranet.who.int/nutrition/gina/en/node/43602>
- World Health Organization and Food and Agriculture Organization of the United Nations. (2020). *Covid-19 and food safety: Guidance for the food businesses*. https://doi.org/10.4103/mjdrdypu.mjdrdypu_187_20
- Yoong, S. L., Nathan, N., Reilly, K., Sutherland, R., Straus, S., Barnes, C., Grady, A., & Wolfenden, L. (2019). Adapting implementation strategies: A case study of how to support implementation of healthy canteen policies. *Public Health*, 177, 19–25. <https://doi.org/10.1016/j.puhe.2019.07.003>