

Application of HACCP in an Indonesian halal restaurant by incorporating halal dietary requirements

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Abstract

This study investigates the safety of ayam lalapan food processing in the catering service, and considers Halal dietary requirements due to the increasing demand for Halal food. Hazard and Haram Analysis Critical Control Point (HHACCP) proposed by Kohilavani et al. [1] is used to analyze the potential hazards as well as to improve the safety of food processing. By using this method, the presence of haram substance is analyzed aside from the regular hazard analysis, which consists of biological, chemical and physical hazards. Critical control points and Halal critical control points are identified to guarantee that the food processing of ayam lalapan meets Halal dietary requirements and is safe for human consumption. The total risk level after improvement can be reduced by 75.64% from 1.05 to 0.29 compared to before improvement.

Keywords: Catering Service; Halal Dietary Requirements; HHACCP; Presence of Haram Substance.

1. Introduction

As the final stage in the food chain, the catering service is a critical sector before the consumer consumes the product. One of the quality management systems to ensure food safety is Hazard Analysis and Critical Control Points (HACCP). HACCP is a method to eliminate or prevent hazards to maintain an acceptable level, by proposing several control measures through analyzing potential hazards at each process step.

The increasing demand for Halal food led to increasing numbers of catering services providing Halal food. According to the Pew Research Center in 2015 [2], the Muslim population in 2010 was 23.2% of the world population and in 2050 will reach 29.7% of the world population, which shows an increase of 6.5%. This issue raises a new problem: since Halal food must meet certain criteria under Halal dietary requirements, special attention must be put to ensure that the served food does meet these requirements.

Halal food is defined as raw materials used in the production process that are permitted under Sharia law, and meets six following conditions [3]. First, the food and its ingredients may not contain any parts or products of animals that are non-halal by Sharia law, or were not slaughtered according to Sharia law. The second condition is that the raw materials do not contain najas (an Arabic term which means "filth") in any quantity. The third condition is that the food is safe for consumption, non-poisonous, non-intoxicating and non-hazardous to health. The fourth condition explains that the product should be prepared, processed or manufactured using equipment that is not contaminated with najas. The fifth condition states that the food may not contain any human parts or derivatives. The sixth condition is the need for full segregation from any other food and materials that do not meet the requirements stated in the first five conditions during its preparation, processing, handling, packaging, storage and distribution.

Unfortunately, the classic HACCP was introduced to ensure food safety by only analyzing three main hazards: biological, chemical

and physical hazard. In 2013, Kohilavani et al. [1] introduced Hazard and Haram Analysis Critical Control Point (HHACCP), a new approach of HACCP, by incorporating the presence of haram substances as part of hazard analysis to deal with the Halal dietary requirements problem.

Many small businesses, like catering services, are not ready to implement HACCP methodology due to the lack of preparation or strong foundation of a prerequisite program. Mortimore and Wallace [4] explained that although we don't have any prerequisite program, we can start from the first principle of the HACCP, which is hazard analysis. It can provide us with some benefits by knowing the potential hazards in the process so that we can undertake some preventive actions to control incoming hazards. This paper will show the implementation of HACCP by considering Halal dietary requirements in the production process of Ayam Lalapan at an Indonesian Halal restaurant in Taipei.

2. Objectives

The objectives of this study are described as follows.

- 1) Fulfilling Halal dietary requirements in the food processing of ayam lalapan by incorporating Halal dietary requirements into Hazard Analysis and Critical Control Point (HACCP).
- 2) Using Hazard and Haram Analysis Critical Control Point to ensure that the delivered food is safe for consumption and also meet Halal dietary requirements.

3. Methods

Hazard and Haram Analysis Critical Control Point (HHACCP) proposed by Kohilavani et al. (2013) [1] is used to analyze the hazards at each process step of ayam lalapan processing. A modular process flow diagram is used to construct the process flow diagram. By using a modular approach, the process can be divided

into different parts and looked at in detail [4]. The hazard evaluation model is derived from the original model proposed by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF) [5]; some changes have been made in this study in order to assess the presence of haram substances and to accommodate catering service environments. In the proposed hazard characteristics, hazard characteristic A has been omitted because the food is not consumed by at-risk populations such as infants and the aged. Because in this study the consumers directly consume the food after processing, hazard characteristic F is also omitted since it considers any control step after packaging and distribution to the customers. In the proposed hazard characteristic, we also consider another hazard, which is the presence of haram substances. Proposed hazard characteristics for biological, chemical, physical hazard, and the presence of haram substances can be seen in Table 1. The risk level of each hazard is then calculated based on the results of the assessed hazard characteristics. Furthermore, we can classify the effect of hazards on each process by averaging the risk level of the associated hazards. The risk level and the effect of hazard on each process can be seen in Table 2 and Table 3, respectively. The highest number indicates the highest risk that should be considered.

Table 1: Proposed Hazard Characteristics for Potential Hazard (Biological, Chemical, and Physical Hazard) and Presence of Haram Substance

Hazard Characteristics	Potential Hazard (Biological, Chemical, And Physical Hazard)	Presence of Haram Substance
A	The product (raw material, work in process product, or finished product) contains potential hazard known as microbiological hazard, chemical hazard and physical hazard	The product (raw material, work in process product, or finished product) contains potential hazard known as Haram Substances
B	The process does not contain a controlled step that prevents, destroys or reduce potential hazard to an acceptable level	The process does not contain a controlled step that prevents, destroys or remove haram substances
C	There is possibility of contamination during the process	There is possibility of contamination during the process
D	There is possibility of mishandling the product during processing or distribution	There is possibility of mishandling the product during the distribution or processing

Table 2: Risk Level

Risk Level	Explanation
4	Any four hazard characteristics (any four of A, B, C, and D).
3	Any three hazard characteristics (any three of A, B, C, and D).
2	Any two hazard characteristics (any two of A, B, C, and D).
1	Any one hazard characteristics (any one of A, B, C, and D).
0	No identified hazard characteristics.

Table 3: Hazard Classification

Risk Level	Effect of Hazard
>3 - 4	high risk
>2 - 3	medium risk
>1 - 2	low risk
0-1	very low risk

4. Results and discussion

A verified modular process flow diagram of ayam lalapan is presented in Fig. 1. There are six modules in the process of making ayam lalapan. Module 1 is related to material reception and material storage of frozen, chilled and ambient products. Module 2 is related to the preparation of frozen food. Module 3 is related to preparation of chilled food. Module 4 is related to preparation of

ambient products. Module 5 is related to the cooking process. Lastly, module 6 is related to serving food.

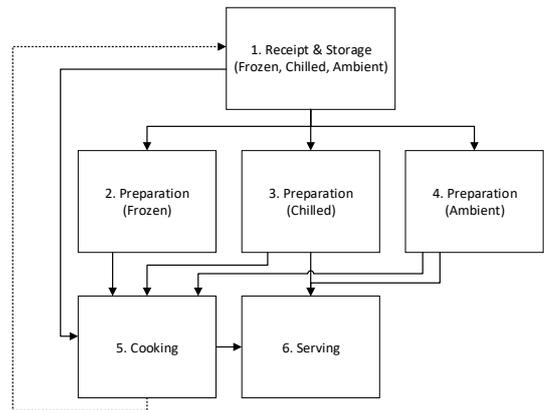


Fig. 1: Modular Process Flow Diagram of Ayam Lalapan.

4.1. Hazard and haram analysis control chart

Hazard and haram analysis is performed to analyze biological, chemical and physical hazard, as well as the presence of haram substances that may occur in the process steps endangering the food. The presence of hazards depends on the nature of the process, since each process does not always involve all four hazard categories (biological, chemical and physical hazards, and the presence of haram substances). First, we analyze the hazards in each process; there are thirty eight biological hazards, nine chemical hazards, six physical hazards and five presences of haram substances found in the food processing of ayam lalapan. The biological hazard is contributed by the possibility of proliferation of pathogens, cross contamination with other materials, and survival of pathogens caused by inadequate heat treatment. The chemical hazard is caused by some pesticides left on the vegetables. The physical hazard is caused by the possible presence of pests, and foreign materials such as plastic, debris, and human body parts. The presence of haram substances is caused by the possibility of the delivered products not meeting the Halal dietary requirements. Table 4 shows a summary of the process's potential hazards.

Table 4: Process Step and Its Associated Potential Hazard on the Process of Making Ayam Lalapan

Potential Hazard	Process Step
Biological Hazard	1.1a, 1.1b, 1.1c, 1.1e, 1.1f, 1.2, 1.3, 1.4, 1.5a, 1.5b, 1.5c, 1.5d, 1.6, 1.7, 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.1, 5.2, 5.3, 5.4, 6.1, 6.2
Chemical Hazard	1.1b, 1.1c, 1.5a, 3.1, 3.2, 3.3, 4.3, 4.4, 4.5
Physical Hazard	1.7, 4.1, 4.2, 5.2, 5.2, 5.3
Presence of Haram Substance	1.1a, 1.1b, 1.1c, 1.1d, 1.1e

After analyzing the hazards in each process, the next step is measuring the significance of the hazard by modifying the hazard characteristics proposed by NACMCF, to determine the significance of potential hazards. The risk level is calculated by calculating the number of hazard characteristics on each potential hazard. For example, the risk level of biological hazard in the process 1.1a is three because there are three hazard characteristics in this hazard. The guidance of the risk level scoring can be seen in Table 2. Similarly, the risk level for the presence of haram substance is two. Finally, we can calculate the risk level of the process step 1.1a by averaging the associated risk levels on the process 1.1a then we get 1.25. Based on Table 3, we can interpret the risk level of process 1.1a as low risk because the value of risk level falls between >1 - 2.

Furthermore, control measures are also identified to ensure that the potential hazards can be controlled, eliminated, or reduced to an acceptable level. Lacking a prerequisite program, the construction of HHACCP can be accommodated by including a personal

hygiene program and pest control program into the control measures. For example, the processes that involve direct contact with humans, such as transferring the goods, moving them to the clean container, peeling off the spices, and chopping are managed by personal hygiene program. The pest control program is to ensure that no pests can enter and spoil the food. A pest control program can be started by eliminating any standing water around the kitchen as well as any shelter where pests can breed and survive. Furthermore, we need to seal all openings, cracks and holes. Additional tools such as bug zapper or glue boards can be used to ensure the safety of the food.

These three analyses: hazard and haram analysis, hazard evaluation, and identification of control measures, are summarized in Table A.1, a hazard and haram analysis control chart.

4.2. Hazard and haram critical control point

Raw material CCPs (Critical Control Points) decision tree [6, 7] and a process step decision tree [8] are used to determine the critical control points in the process of making ayam lalapan. Mean-

while, the raw material and process step HCCPs (Halal Critical Control Points) decision tree [1] is used to determine the Halal critical control points. The raw material and process HCCP decision tree, raw material CCP decision tree, and summary of the process step CCP decision tree can be seen in Table 5, Table 6, and Table 7, respectively.

Based on the process step decision tree, there are six CCPs have been found in the food processing of ayam lalapan. These CCPs are mainly caused by the possible proliferation of pathogens and survival of pathogens during the cooking process. Freezing and chilling at certain temperatures prevent the proliferation of pathogens and keep the products fresh. Cooking at certain temperature is suggested to kill the pathogens in the products. According to HCCPs decision tree, there is only one HCCP has been found in the process of making ayam lalapan. Vegetables, spices and tempe are Halal critical control points but unable to certify. Halal critical points and critical control points can be seen in Table 8.

Table 1: Raw Material and Process HCCP Decision Tree

Process Step	Raw material	Q1. Do all product raw materials have halal certification?	Q2. Is there any possibility for cross contamination of haram substances?	Q3. Are the non-certified products are being used in the process?	Q4. Do the materials contain any haram substances?	Q5. Is there specific production line and storage area for certified and non-certified process and ingredients clearly dedicated?	Q6. Could the sanitation procedure able to eliminate the fat, smell, colour and taste (dibagh)?	Q7 : Is there any potential cross contamination of haram substances?	HCCP
	Meat and egg	Yes	No	-	-	-	-	-	No
1.1	Vegetables, spices, and tempe	No	-	Yes (Unable to certify)	-	-	-	-	Yes (Unable to certify)
	Seasoning	Yes	No	-	-	-	-	-	No

Table 2: Raw Material Ccp Decision Tree

Raw material	Q1. Is there a significant hazard associated with this raw material?	Q2. Are you or the customer going to process this hazard out of the product?	Q3. Is there a cross-contamination risk to the facility or to other products which will not be controlled?	CCP
Meat				
Presence of pathogens	Yes	Yes	No	No
Vegetables, Spices				
Pesticide residual	Yes	Yes	No	No
Bacteria	Yes	Yes	No	No
Tempe (Bacteria)	Yes	Yes	No	No
Egg (Salmonella Enteritidis)	Yes	Yes	No	No

Table 3: Summary of Process Step CCP Decision Tree

Process Step	Q1. Is there a significant hazard at this process step	Q2. Do control measure(s) exist for the identified hazard?	Q2a. Is control necessary at this step for safety?	Q3. Is this step specifically designed to eliminate or reduce the likely occurrence of the hazard to an acceptable level?	Q4. Could contamination occur at, or increase, to unacceptable level(s)?	Q5. Will a subsequent step or action eliminate or reduce the hazard to an acceptable level?	CCP
1.3 Store frozen	Yes	Yes	-	Yes	-	-	Yes
1.5a Store chilled (vegetables)	Yes	Yes	-	Yes	-	-	Yes
1.5b Store chilled (tempe)	Yes	Yes	-	Yes	-	-	Yes
1.5c Store chilled (chopped vegetables)	Yes	Yes	-	Yes	-	-	Yes
1.5d Store chilled (cooked meat)	Yes	Yes	-	Yes	-	-	Yes
5.4 Cook According to recipe	Yes	Yes	-	Yes	-	-	Yes

4.3. Establish halal critical limits and critical limits

The identified Halal critical control points and critical control points are then analyzed to determine the associated critical limits. These limits are called critical limits and are used to differentiate

between safe and unsafe operating conditions. Since Halal food must meet Halal dietary requirements, the Halal critical limits must be zero for any kind of haram substances. HCCP1 is the possible presence of haram substances on the vegetables, spices and tempe. Although all vegetables and spices do

not have the Halal logo, they are still permitted by Halal dietary requirements as long as the vegetables and spices are not poisonous, intoxicating or dangerous to health [3]. Tempe, as a derivative product from soybeans, is Halal too. So, we need to ensure that the suppliers only use vegetables and spices those are not contaminated with other products. Keeping a good relationship and good communication with suppliers is important to gain transparency from the supplier. Also, we need to encourage the supplier to do the Halal practice correctly. To ensure that both supplier and restaurant do the Halal practice, the availability of Halal food certification in our business can assure the consumer that all the served food meet Halal dietary requirements. In Taiwan, we can apply for Halal certification from external institution, such as in Taiwan Halal Integrity Development Association (THIDA) [9].

CCP 1 is keeping the food frozen. The freezer temperature must be at 00F (-17.80C). Keeping the products in a frozen state inhibits the proliferation of pathogens in the meat.

CCP 2, 3, 4 and 5 are related to the chilling process. The chiller temperature must be at 400F (4.40C) or below. Similar to keeping products in a frozen state, keeping products at chilled temperature inhibits the proliferation of pathogens in the vegetables, tempe, chopped vegetables and cooked meat.

CCP 6 is related to the cooking process. Cooking the products at a certain temperature is suggested to ensure that the food is safe and free of pathogens. The cooking process is a method to kill the surviving pathogens inside the product. Table 8 shows the critical limits on each HCCP and CCP.

4.4. Establish monitoring procedures and corrective actions

Monitoring procedures are established at every CCP and HCCP to ensure that the established critical limits are achieved and maintained. Corrective actions should also be determined to ensure that the established control measures are done, and to eliminate any deviations during the process. Table 8 shows the monitoring procedures and corrective actions which should be taken on each HCCP and CCP.

4.5. Documentation, verification procedures, and record keeping

Afterwards, the developed HHACCP control chart must be verified periodically or every time a process or method is changed. The first step of verification procedures is carried out by verifying the process flow diagram. Furthermore, verification of a comprehensive HHACCP system should also be performed annually. These verification activities are to ensure that both the methods and procedures are implemented accurately and effectively.

Documentation and record keeping provide evidence that the constructed HHACCP plan is maintained and implemented according to the plan. Record keeping includes the CCP monitoring results, and the finding of losses or deviations and their associated corrective actions. Documentation includes the hazard and haram analysis control chart and HHACCP control chart.

4.6. Comparison between before and after improvement

In order to see the difference in risk level before and after improvement, the current condition at the restaurant is compared to the proposed control measures. For example, the risk level of the current condition in the process 1.1a is 1.25, but after the proposed control measures (e.g. freezing the product as soon as possible, cooking the product at a later step, checking the halal label, and frequently auditing the supplier) are conducted, the risk level on process 1.1a can be reduced to 0.25. Table 9 shows hazard and haram analysis of process 1.1a after the condition is improved.

In Table 9 we can see that process 1.1a is no longer has a presence of haram substance as a hazard. Since the restaurant has applied the proposed control measures, which is checking the Halal label and frequently auditing supplier, the hazard now has control step. Although preventive actions have been taken, there is still a chance of biological hazard occurrence since meat very easily becomes contaminated. Therefore, we assign "one" on the hazard characteristic A. The way to ensure that the hazard can be controlled is by frequently auditing the suppliers, and checking whether the suppliers have the proper conditions to prevent this biological hazard from proliferating. After receiving the meat, the way the restaurant can control the hazard is to inhibit the proliferation of biological hazards by cooking it at the later step.

Then, the total risk level of ayam lalapan processing after the condition is improved can be calculated by averaging the risk level on each process step. As shown in Fig. 2, the total risk level of the current condition for ayam lalapan processing has been reduced by 75.64% to 0.29, which can be interpreted as very low risk.

Table 8: Hhacpp Control Chart

No.	Process	Potential Hazard	Control Measure	Critical limits	Monitoring	Monitoring Frequency	Monitoring responsibility	Corrective Action	Corrective Action Responsibility
HCCP 1	Check the incoming Ingredient: Vegetables, spices, and Tempe	Haram substances	- The supplier must be chosen correctly and frequently audited - Avoid any non-Halal products Ensure one container is not loaded with too much meat so that all parts of the meat can stay frozen	Reject products if they do not meet the halal requirements	Check the supplier	1 week	Chef / Restaurant owner	- Reject products - Change supplier	Chef / Restaurant owner
CCP 1	1.3 Store frozen	Possible proliferation of pathogens	- Ensure one container is not loaded with too much vegetables so that all parts of the vegetables can stay	Ensure the freezer temperature is at 0 °F (-17.8 °C)	- Check the temperature using thermometer - Frequently calibrate the thermometer	1 hour 1 month	Chef	Check the products and call repairman to fix the refrigerator	Chef
CCP 2	1.5a Store chilled (vegetables)	Possible proliferation of pathogens	- Ensure one container is not loaded with too much vegetables so that all parts of the vegetables can stay	Ensure the chiller temperature is at 40 °F (4.4 °C) or below	- Check the temperature using thermometer - Frequently calibrate the thermometer	1 hour 1 month	Chef	Check the products and call repairman to fix the refrigerator	Chef

CCP 3	1.5b Store chilled (tempe)	Possible proliferation of pathogens	chilled	Ensure the chiller temperature is at 40 °F (4.4 °C) or below	- Separate container between cooked one with the unprocessed food	- Check the temperature using thermometer	1 hour	Chef	Check the products and call repairman to fix the refrigerator	Chef	
			- Ensure one container is not loaded with too much tempe so that all parts of tempe can stay chilled		- Frequently calibrate the thermometer		1 month				
			- Separate container between cooked one with the unprocessed food		- Check the temperature using thermometer		1 hour				
CCP 4	1.5c Store chilled (chopped vegetables)	Possible proliferation of pathogens	chopped vegetables so that all parts of the chopped vegetables can stay chilled	Ensure the chiller temperature is at 40 °F (4.4 °C) or below	- Separate container between cooked one with the unprocessed food	- Check the temperature using thermometer	1 hour	Chef	Check the products and call repairman to fix the refrigerator	Chef	
			- Ensure one container is not loaded with too much chopped		- Frequently calibrate the thermometer		1 month				
			- Separate container between cooked one with the unprocessed food		- Check the temperature using thermometer		1 hour				
CCP 5	1.5b Store chilled (cooked meat)	Possible proliferation of the pathogens	meat so that all parts of the cooked meat can stay chilled	Ensure the chiller temperature is at 40 °F (4.4 °C) or below and eat within 3 to 4 days	- Separate container between cooked one with the unprocessed food	- Check the temperature using thermometer	1 hour	Chef	Check the products and call repairman to fix the refrigerator	Chef	
			- Ensure one container is not loaded with too much cooked		- Frequently calibrate the thermometer		1 month				
			- Separate container between cooked one with the unprocessed food		- Check the temperature using thermometer		1 hour				
CCP 6	5.3 Cook According to recipe	Survival of pathogens caused by inadequate heat temperature and do not meet the standard cooking time	- Chicken Cook the dish and check if the internal temperature meets certain criteria.	- Chicken The temperature of the innermost part of the thigh, innermost part of the wing and the thickest part of the breast must be greater than 165 °F	- Egg Cook the egg until it reaches certain temperature	- Egg Ensure the egg temperature reaches 160 °F	- Check the temperature using meat thermometer	Each meat	Chef	Cook until the products have the minimum permitted temperature	Chef

Table 9: Hazard and Haram Analysis of Process 1.1a (After Improvement)

Process Step	Potential Hazard	Hazard Analysis Hazard Characteristics					Risk levels
		A	B	C	D	E	
1.1a Meat receiving	Biological hazard : Salmonella Enteritidis, Staphylococcus aureus, Campylobacter jejuni, Listeria monocytogenes, Escherichia coli (E. coli)	1					1
	Chemical hazard : chemical compound						
	Physical Hazard : Damaged product						
	Presence of haram substance : Non-Halal meat						

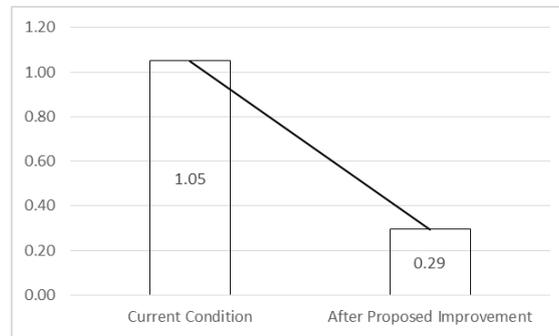


Fig. 2: Risk Level Before and after Improvement.

5. Conclusion

This study found that Halal dietary requirements can be incorporated into the regular HACCP and used to analyze the process in catering service to ensure that the delivered food meets Halal dietary requirements. HHACCP methodology proposed by Kohilavani et al. (2013) had been implemented in the food processing of ayam lalapan at the Indonesian Halal Restaurant in Taipei, and we found that the risk level of the current condition is low, with the index of 1.05. The proposed control measures can reduce the risk level by 75.64% to 0.29, which is considered as very low risk.

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Appendix A

Hazard and haram analysis control chart

Table A.1: Hazard and Haram Analysis Control Chart

Process Steps	Potential Hazards	Hazard Analysis Hazard Characteristics				Risk Level	Control Measures
		A Contain Hazard	B No Control Step	C Contamination during process	D Mishandling the product		
Module 1 - Receipt and Storage							
1.1 Check the incoming raw materials a. Meat	Biological hazard : Salmonella Enteritidis, Staphylococcus aureus, Campylobacter jejuni, Listeria monocytogenes, Escherichia coli (E. coli)	1	1	1		3	- Freeze the product as soon as possible - Cooking the product in later step - Frequently audit the supplier
	Chemical hazard					0	
	Physical Hazard					0	
	Presence of haram substance : Non-Halal meat	1	1			2	- Check the halal label-Frequently audit the supplier

	Biological hazard : Bacteria (E.Coli)	1	1	1	3	- Wash the product in latter step - Separate the vegetables from other foods such as raw meat, poultry or seafood - Cooking the product in latter step - Wash the product in latter step - Frequently audit the supplier
b. Vegetables	Chemical hazard : Pesticide residual	1	1		2	- Wash the product in latter step - Frequently audit the supplier
	Physical Hazard Presence of haram substance : Cross contamination with non-Halal products in the supplier	1	1		2	- Ensure the origin of the products - Frequently audit the supplier
	Biological hazard : Bacteria (E.Coli)	1	1	1	3	- Wash the product in latter step - Separate the vegetables from other foods such as raw meat, poultry or seafood - Cooking the product in latter step - Wash the product in latter step - Frequently audit the supplier
c. Spices	Chemical hazard : Pesticide residual	1	1		2	- Wash the product in latter step - Frequently audit the supplier
	Physical Hazard Presence of haram substance : Cross contamination with non-Halal products in the supplier	1	1		2	- Ensure the origin of the products - Frequently audit the supplier
	Biological hazard				0	
	Chemical hazard				0	
	Physical Hazard				0	
d. Seasoning	Presence of haram substance : Non-Halal seasoning	1	1		2	- Ensure the origin of the products - Frequently audit the supplier - Wash the product in latter step - Separate the vegetables from other foods such as raw meat, poultry or seafood - Cooking the product in latter step
	Biological hazard	1	1	1	3	- Wash the product in latter step - Separate the vegetables from other foods such as raw meat, poultry or seafood - Cooking the product in latter step
e. Tempe	Chemical hazard				0	
	Physical Hazard				0	
	Presence of haram substance : Non-Halal seasoning	1	1		2	- Ensure the origin of the products - Frequently audit the supplier - Cooking the product in latter step
f. Egg	Biological hazard : Salmonella Enteritidis	1	1	1	3	- Wash the product in latter step - Frequently audit the supplier
	Chemical hazard				0	

	Physical Hazard					0	
	Presence of haram substance : Non-Halal seasoning					0	
1.2 Transfer to freezer	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Managed by rapid transfer the incoming raw material to the freezer
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	
1.3 Store frozen	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Monitor the freezer temperature
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	
1.4 Transfer to Chiller	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Managed by rapid transfer the incoming raw material to the chiller
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	
1.5 Store chilled	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Monitor the chiller temperature
a. Vegetables	Chemical hazard	1	1			2	- Wash the product in latter step
	Physical Hazard					0	
	presence of haram substance					0	
b. Tempe	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Monitor the chiller temperature
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	
c. Chopped vegetables	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Monitor the chiller temperature
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	
d. Cooked meat	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Monitor the chiller temperature
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	
1.6 Transfer to ambient store	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Proper handling to prevent damaged goods
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	
1.7 Store at ambient temperature	Biological hazard : Possible growth of mold if stored wet	1	1		1	3	- Ensure the storage is dry to prevent the growing of mold
	Chemical hazard					0	
	Physical hazard : Damaged product & presence of pests	1	1		1	3	- Check and document the expiration date of each product - Store at dry place - Pest control

							program
Module 2 - Preparation (Frozen)							0
2.1 Transfer raw meat to the kitchen	presence of haram substance						
	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Rapid transfer to the kitchen for cooking process
	Chemical hazard Physical Hazard presence of haram substance					0 0 0	
2.2 Defrosting	Biological hazard : Possible growth of the pathogens	1	1		1	3	Three ways to thaw chicken: 1. In the refrigerator May take 1 to 2 days or longer to thaw 2. In cold water Submerge the chicken in cold water, changing the water every 30 minutes to be sure it stays cold (2 to 3 hours). Cook immediately after thawing 3. In the microwave Should be cooked immediately after thawing
	Chemical hazard Physical Hazard presence of haram substance Biological hazard : Contamination with pathogens	1	1			0 0 0 2	- Wash the meat by using flowing water
2.3 Washing	Chemical hazard Physical Hazard presence of haram substance Biological hazard : Possible cross contamination with other materials	1	1	1	1	4	- Segregation of cutting board and knives
	Chemical hazard Physical Hazard presence of haram substance Biological hazard : Possible cross contamination with other materials					0 0 0 0	
Module 3 - Preparation (Chilled)							
3.1 Transfer vegetables to kitchen table	Biological hazard : Possible growth of the pathogens	1	1		1	3	- Managed by rapid transfer the vegetables to the kitchen - Managed by personal hygiene program
	Chemical hazard : Pesticide is left in the vegetables Physical Hazard presence of haram substance Biological hazard : Possible cross contamination with other materials	1	1			2 0 0 4	- Wash the product in latter step
3.2 Chopping the vegetables (according to recipe)	Chemical hazard : Pesticide is left in the vegetables Physical Hazard	1	1			2 0	- Segregation of cutting board and knives - Wash the product in latter step
	Chemical hazard : Pesticide is left in the vegetables	1	1			2	
							0

	presence of haram substance						0	
3.3 Wash the vegetable	Biological hazard : Some pathogens is left in the vegetables	1	1				2	- Wash the vegetables by using flowing water
	Chemical hazard : Pesticide is left in the vegetables	1	1				2	- Wash the vegetables by using flowing water
3.4 Move to clean container	Physical Hazard						0	
	presence of haram substance						0	
	Biological hazard : Possible growth of the pathogens	1	1		1		3	- Ensure the container is clean and dry
	Chemical hazard						0	
3.5 Transfer tempe to kitchen table	Physical Hazard						0	
	presence of haram substance						0	
	Biological hazard : Possible growth of the pathogens	1	1		1		3	- Managed by rapid transfer the vegetables to the kitchen - Managed by personal hygiene program
3.6 Chopping the tempe (according to recipe)	Chemical hazard						0	
	Physical Hazard						0	
	presence of haram substance						0	
	Biological hazard : Possible cross contamination with other materials	1	1	1	1		4	- Segregation of cutting board and knives
3.7 Wash the tempe	Chemical hazard						0	
	Physical Hazard						0	
	presence of haram substance						0	
3.8 Move to clean container	Biological hazard : Possible growth of the pathogens	1	1		1		3	- Wash the vegetables by using flowing water
	Chemical hazard						0	
Module 4 - Preparation (Ambient)	Physical Hazard						0	
	presence of haram substance						0	
	Biological hazard : Cross contamination due to bad personal hygiene	1	1	1			3	- Ensure the container is clean and dry
4.1 De-box seasonings and transfer to kitchen table	Chemical hazard						0	
	Physical Hazard	1	1		1		3	- Managed by personal hygiene program
4.2 Decant into containers	presence of haram substance						0	
	Biological hazard : Cross contamination due to bad personal hygiene	1	1	1			3	- Open the packaging carefully to avoid the debris of the packaging fall into the products
	Chemical hazard						0	
	Physical Hazard	1	1		1		3	- Managed by personal hygiene program - Ensure the container is clean and dry - Inspect carefully in decanting

	presence of haram substance						0	
4.3 Take some spices from storage (according to recipes)	Biological hazard : Cross contamination due to bad personal hygiene	1	1	1			3	- Managed by personal hygiene program
	Chemical hazard : pesticide is left in the spices	1	1				2	- Wash the spices by using flowing water
4.4 Peel off the spices	Physical Hazard presence of haram substance						0	
	Biological hazard : Possible cross contamination with other materials	1	1	1	1		4	- Segregation of cutting board and knives
	Chemical hazard : pesticide is left in the spices	1	1				2	- Wash the spices by using flowing water
4.5 Wash the spices	Physical Hazard presence of haram substance						0	
	Biological hazard : Some pathogens are left	1	1				2	- Wash the spices by using flowing water
4.6 Chop (according to recipe)	Chemical hazard : pesticide is left in the spices	1	1				2	- Wash the spices by using flowing water
	Physical Hazard presence of haram substance						0	
4.6 Chop (according to recipe)	Biological hazard : Possible cross contamination with other materials	1	1	1	1		4	- Segregation of cutting board and knives
	Chemical hazard presence of haram substance						0	
Module 5 - Cook								
5.1 Seasoning the meat (according to recipe)	Biological hazard : Cross contamination due to bad personal hygiene	1	1	1			3	- Managed by personal hygiene program
	Chemical hazard						0	
5.2 Move to clean container	Physical Hazard presence of haram substance						0	
	Biological hazard : Cross contamination due to bad personal hygiene	1	1	1			3	- Managed by personal hygiene program
	Chemical hazard						0	
5.3 Store at ambient temperature	Physical Hazard	1	1		1		3	- Ensure the container is clean and dry
	presence of haram substance						0	
	Biological hazard	1	1	1	1	1	4	- Ensure the storage is dry and properly covered
	Chemical hazard						0	
5.4 Cook according to recipe	Physical hazard : Presence of pests	1	1	1			3	- Ensure the container is properly covered to avoid pest ingress - Pest Control program
	presence of haram substance						0	
5.4 Cook according to recipe	Biological Hazard : Survival of pathogens caused by inadequate heat temperature	1	1	1	1	1	4	- Ensure the cooking process achieve the standard time and approved temperature - Managed by personal

	Chemical hazard					0	hygiene program
	Physical Hazard					0	
	presence of haram substance					0	
Module 6 - Serve Meal							
	Biological hazard	1	1	1	1	4	- Ensure the storage is dry and properly covered
	Chemical hazard					0	
6.1 Store at ambient temperature							
	Physical hazard : Presence of pests	1	1	1		3	- Ensure the container is properly covered to avoid pest ingress - Pest Control program
	presence of haram substance					0	
6.2 Serve Meal (Plate or take-away container)							
	Biological Hazard : Cross contamination due to improper container (plate)	1	1		1	3	- Managed by personal hygiene program
	Chemical hazard					0	
	Physical Hazard					0	
	presence of haram substance					0	