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Risk Mitigation Analysis in the Supply Chain of Halal Poduk MSMEs Using the HOR (House of Risk) Method at UD. Al-Manshurien

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Abstract

UD. Al-Manshurien is one of the MSMEs of halal products in Bangkalan and is engaged in the traditional herbal beverage processing industry. This business unit processes raw materials into finished or semi-finished materials until they reach consumers who are closely related to the supply chain. In supply chain activities, it is very possible that risks and impacts from these activities can cause negative consequences or large losses if left unchecked. It is important to identify and mitigate risks using the House of Risk model. This study aims to identify risks affecting the supply chain and risk management strategies for halal products in UD. Al-Manshurien. The method used is supply chain mapping and House of Risk (HOR) analysis. The results of the study using HOR analysis contain three dominant risk agents, namely (A1) mismanagement of warehousing, (A18) lack of safe packaging of product delivery, and (A10) No recording of raw material stock. Alternative risk management strategies that consider effectiveness in their implementation are making records related to warehousing stock and product stock (PA1), conducting routine monitoring to check warehousing inventory and product inventory (PA2), and making records of raw material stock (PA3).

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INTRODUCTION

Indonesia is the country with the largest Muslim population in the world. According to *a report by The Royal Islamic Strategic Studies* Center (RISSC), based on data from the Central Statistics Agency in 2022, Indonesia is a country with a Muslim population of around 86.7% of the total population of 275,773.8 million people. As a country with the largest Muslim population in the world, Indonesia also has the ability

to become the largest halal food producer in the world. Based on the Global Islamic Economic Indicators in the (Laili and Fajar, 2022) *State of the Global Islamic Economy* (SGIE) 2022 Report, Indonesia occupies the second position in the halal food product sector. (Indonesian Sharia Economic Festival, 2022) Currently, halal industry trends are becoming a hot topic in international business. In addition, international trade is one of the efforts to increase economic growth and development. Producing processed products, both food, beverages, cosmetics and other products that are safe and halal is a very promising business for the Muslim community using halal certification and labeling. Therefore, the public also needs to understand competitive advantage, the source of the latest competitive advantage is innovation and creativity. The halal industry, which has become a lifestyle in the community, supports the development of the halal industry in Indonesia with the added value aspect of the existence of various cultures in Indonesia. (Saputri , 2020) This is supported by government policies related to halal obligations in 2024. Where all goods and services marketed and circulating in Indonesia must have a halal certificate. Therefore, MSMEs are now flocking to register halal certification for the products they market. (Heryani , 2022)

Micro, Small, and Medium Enterprises (MSMEs) in Indonesia contribute to the Gross Domestic Product (GDP) of 59.08% or Rp 4,869.57 trillion with a growth rate of 6.4% per year. This is supported by data on the contribution of MSMEs in exports of 14.37% and in trade in ASEAN, MSMEs play a role of 6.3%. Economic growth is a process of increasing output per capita in the long term. So that MSMEs in Indonesia have an important role in economic growth and development. (Hanim and Noorman, 2018) (Nuraliyah , Adiba and Amir, 2023) . One of the elements that plays an important role in development is social capital owned by the community.

One of the regions in Indonesia where the majority of the population is Muslim and has the potential to develop MSMEs is on Madura Island. Madura Island itself has four districts, namely Bangkalan, Sampang, Pamekasan, and Sumenep Regencies. Bangkalan Regency is one of the districts that is located quite strategically because it is close to Surabaya which is directly connected to the Suramadu Bridge. In addition, based on data Bangkalan Regency also has many MSMEs, approximately 166,495 MSMEs spread across each region. One of the MSMEs in Bangkalan Regency that has been certified halal is UD. Al-Manshurien. Office Cooperation and Business Micro (2023)

UD. Al-Manshurien is one of the small industries engaged in the health beverage processing industry. These MSMEs produce various types of health drinks such as sour turmeric jamu, telang flowers, pokak, kencur rice, areca nut, dried lemon, temulawak and many more. This health drink is marketed in the form of powders and ready-to-eat drinks under the Naturna brand. In several MSMEs, including UD. Al-Manshurien processes raw materials into finished products to reach consumers who are closely related to the *supply chain*. *Supply chain* is an activity that starts from obtaining raw materials, processing to becoming finished products and distributing them to consumers (Azhra , 2021). *Supply Chain Management* (SCM) is a chain cycle that is closely related starting from raw material

suppliers to companies which are then distributed to end consumers. According to the supply chain, it is one of the most important sectors in a business because it is related to product distribution patterns. Supply chain network optimization can be done with the aim of minimizing the cost of agricultural commodity distribution. In supply chain activities, it is very possible that the risks and impacts arising from these activities can cause negative consequences or great losses if left unchecked. Therefore, it is necessary to identify and strategize risk management so that business performance can be maximized. (Dewi and Suprapti, 2022). Ardiansyah & Nugroho (2022)

In general, risk is assessed as something negative such as consequences, losses or dangers. According to Thian (2021) Risk is an event or event that, if it occurs, can slow down the achievement of a company's goals or objectives caused by internal and external factors. According to Risk, it is the possibility of unexpected events that if they occur can be detrimental to the company. From this opinion, it can be concluded that risk is the uncertainty of events that if it occurs can be detrimental to the company. Risks can be caused by internal or external factors of a company. New (2017) Risk management is the activity of managing risk by monitoring risk triggers, tracking, and efforts to minimize risk According to Risk management is the process of identifying, measuring risk, and developing strategies to manage existing resources and can be used to transfer risk to other parties, minimizing the impact and consequences of certain risks. So risk management is a management activity (planning, organizing, organizing and supervising) to manage risks so that they can be controlled, managed and minimize losses. The risk management process includes risk identification using branstorming techniques, surveys, interviews, historical information, working groups and others. After identification, a risk analysis can be carried out. (Waluyo, 2022). Hairul, (2020)

The *House of risk* (HOR) model is an analytical tool designed to identify, analyze, evaluate risks and plan risks in a company's supply chain This HOR method is a development of the Quality (Ulfah, 2022). *Function Deployment (*QFD) method, where this model uses *a House of Quality* (HOQ) to develop risk management strategies in addressing risks that have the potential to arise in the supply chain. According to the HOR method, there are several stages including setting the probability for the risk list, and the severity of the risk. Risk events can be induced from a single risk list, thus requiring an Ulfah, (2022) *aggregate number of potential risks* from the source of risk. If the probability of occurrence of the risk list $_j$ is Oj, the impact *of the occurrence of risk events* $_i$ is Si, and the correlation value between the two is Rij.

Based on this, it is necessary to carry out supply chain mapping to find out the activities from *the source, plan, create, convey and restore* business processes at UD. Al-Manshurien. Identify and measure potential risks in the supply chain using the *House of Risk* (HOR) model. The HOR model consists of two stages, namely HOR phase 1 is used to identify risks and analyze *the dominant risk agents* in the business. The HOR phase 2 analysis is used to formulate an effective risk management strategy to be implemented within the company. So if this research is not carried out, companies will find it difficult to anticipate future business risks. Therefore, companies need to prepare and plan risk management strategies so that companies are better prepared to face future risks.

RESEARCH METHODS

The data used in this study are primary data and secondary data. Primary data in this study were obtained from observations and interviews with respondents. The respondents selected in this study are owners and workers at UD Al-Manshurien as experts and know the possible risks. The secondary data used in this study are journals, scientific articles, books, and other literature related to this study.

The data collection method used in this study is by observation, interviews, documentation and filling out questionnaires. Observation is one of the data collection methods carried out by researchers by observing, seeing, hearing and inferring from human behavior, work processes, natural symptoms and respondents who are not too large. Observation was carried out by making direct observations to the research location, namely at UD. Al-Manshurien. The data analysis used to identify supply chain risks and risk management strategies is carried out using (Makbul , 2021) *the House Of Risk* (HOR) method. Interview is the process of interaction between the interviewer and the interviewee through direct communication or face-to-face conversation (Joseph, 2017) . Interviews in this study were conducted with expert respondents to obtain information related to risk identification and risk mitigation implementation steps. Documentation is one of the data collection methods carried out by direct observation to find out the picture in the field and as a complement to observation and interview methods. Questionnaire is one of the data collection methods that is carried out by providing several questions related to research in writing (in the form of *hard files*, soft files and *link forms*). This study uses questionnaires to obtain the value of (Prawiyogi *dkk .* , 2021) *risk events, risk agents,* correlation between the two, and the effectiveness of the implementation of risk management strategies.

The data analysis used to identify supply chain risks and risk management strategies uses *the House Of Risk* (HOR) method. The risk list and calculation *of the phase 1 risk house* are used to identify risks and analyze *the dominant risk agents* in the business. The HOR phase 2 analysis is used to formulate an effective risk management strategy to be implemented within the company.

The formula for determining the value *of the Aggregate Potential Risk* (ARP) is as follows:

$$ARPj = Oj \sum SiRij$$

Information:
ARPj : *Potential Aggregate Risk*
Oj : *Level of risk*
The : *Risk severity*
Rij : Appreciate the correlation between risk and risk agents

$$TEk = \sum ARP_{jEjKj}$$

Information:
Tech : The sum of the effectiveness of each action
ARPj : *Potential Aggregate Risk*
Ejk : Correlation between every precaution and every risk agent

RESULT

UD. Al-Manshurien is a company engaged in the production of traditional herbal drinks and has been certified halal. This trading unit was established on May

3, 2014 and began to be halal certified in 2017. UD. Al-Manshurien is located on Jl. Yakurt Blok ED/2, Taman Gili Housing, East Gili Village, Kamal District, Bangkalan Regency. The name of the product manufactured by UD. Al-Manshurien is a product of NATURNA which was previously called Jamu Bu Dhe. NATURNA products have now begun to vary from liquid and powdered herbal drinks. The liquid products offered include sour turmeric, pokak, telang flowers, kencur rice, areca nut, and temulawak. As for the powder products offered, among others, empon-empon, ginger emplit, pokak, celery mixture, star fruit leaf mixture, and lemongrass mixture.

At UD. Al-Manshurien has 7 production activities carried out. The following are the details of production activities from UD. Al-Manshurien can be seen in table 1:

Table 1 UD Production Activities. Al-Manshurien

Business Process	Activity	Code
Plan	Production planning	C1
	Availability control	C2
Source	Delivery of raw materials from the supply chain	C3
	Procurement of raw materials	C4
Make	Production Process	C5
Give	Delivery of products to consumers	C6
Return	Product Returns	C7

Source: Primary data processed, 2023

Risk identification

After identifying risks to supply chain activities that occur in UD. Al-Manshurien, continued by identifying risk events that can occur based on the production activities carried out by this business. Risk identification is carried out by interviews and direct observation and then given a questionnaire to provide an impact assessment related to *the risk event* with experts .

Based on observations, interviews and filling out questionnaires by experts, 20 *risk events* in UD's supply chain activities were obtained. Al-Manshurien. Table 2 is the results of risk identification in UD. Al-Manshurien.

Table 2 Identify Risk Events

Process	Activity	Risk Events	Code	Severity
Plan	Production planning	Sudden changes in production plans	E1	2
		Sudden changes in production plans	E2	7
	Handling Settings	Out of stock in the warehouse	E3	8
Source	Delivery of raw materials from suppliers	Raw material supply disruption	E4	8
		Delay in the supply of raw materials from suppliers	E5	9

	Procurement of raw materials	The existence of raw materials that have substandard quality	E6	9
		Raw material prices rise	E7	7
		Delays in production execution	E8	7
		Lack of engine maintenance	E9	7
		Insufficient raw materials for production	E10	8
Make	Production Process	Washing unclean raw materials	E11	9
		Labor shortages when demand is high	E12	9
		Damage to rejec products	E13	9
		Damage during packaging	E14	9
		Production process is disrupted	E15	7
		Delays in product delivery to consumers	E16	7
Give	Delivery of products to consumers	Product damage during shipping	E17	9
		Consumers cannot come at any time to the production house	E18	4
Return	Product Returns	Return of defective products	E19	9
		Complaints from customers	E20	9

Source: Primary data processed, 2023

After identifying the risk event, the next step is to identify the *source of risk (risk agent)* that is the cause of the risk event in supply chain activities in UD. Al-Manshurien. The following Table 3 contains the results of the identification of risk sources:

Table 3 Identify sources of risk

Process	Activity	Risk Agent	Code	Event
Plan	Production planning	Mismanagement of warehousing	A1	6
		Absence of financial records	A2	6
	Handling Settings	Absence of regular monitoring of warehouse inventory	A3	2
Source	Delivery of raw materials from suppliers	Stock from empty suppliers	A4	2
		Constraints on the delivery of raw materials (natural/technical factors)	A5	3
	Procurement of raw materials	Some raw materials spoil because they are stored for too long	A6	2
		Scarcity of raw materials	A7	3
Make	Production Process	Miscalculation of product stock	A8	4
		Lack of monitoring of production machines	A9	1
		No recording of raw material stock	A10	4
		Lack of *quality control*	A11	1
		Lack of human resources	A12	5

		Production errors	A13	1
		Employee negligence	A14	2
		Power outages	A15	3
		Ruak production machine/malfunction	A16	2
		Natural factors as well as technical factors	A17	2
Give	Delivery of products to consumers	Less *shipping* of safety packaging products	A18	5
		Absence of employees specializing in administration or shopkeepers	A19	6
		Damage during childbirth	A20	2
Return	Product Returns	The product is not in accordance with the order	A21	1

Source: Primary data processed, 2023

In this study, the data processing process was carried out with 2 *House of Risk* (HOR) models, which in this model used two-stage processing. HOR phase 1 aims to determine the source of risk that is a priority to be provided with solutions using HOR phase 2. The first step applied in data processing is to identify risks and risk agents, then provide a risk score in the form of *severity, event* and correlation values and calculate *the Aggregate Risk Potential* (ARP) to determine the risk that will be provided by the solution based on the ARP value obtained.

House of Risk Fase 1

In House of Risk phase 1, *the Aggregate Potential Risk calculation is carried out* which aims to find out what risk priorities will be handled or mitigated. An example of ARP calculation is as follows:

$$ARPj = O_j \sum SiRij$$

$$ARP1 = 6\ [(9x2)+(9x8)+(3x7)+(9x8)+(9x7)]$$

$$ARP1 = 1476$$

In determining the dominant risk, it is obtained based on the value from the highest ARP to the risk with a lower ARP value. This means that the risk with the highest ARP is the one that has the first priority to be addressed.

After that, create a risk table house. The HOR table phase 1 is the final stage of the risk identification process. The table shows *the severity of* a risk event, the occurrence of the source of risk and also the correlation between the risk event and the source of risk obtained based on the results of interviews and questionnaires with *experts*. Not only that, the HOR phase one table also shows the results of the calculation of the *Aggregate Potential Risk* (ARP) value of *Risk Agents* and also the rating *of Risk Agents* which are priority risk mitigation. Table 4 below is a table of the HOR phase 1 model:

Table 4 Model HOR Fase 1

Risk Event	Risk Agent																					Severity of risk
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	
E1	9		9	1	1			3														2
E2		9																				7
E3	9		9	9	3		9			3												8
E4				3	3		3			1												8
E5				3	9																	9
E6						9																9
E7							9															7
E8	3		3	3	1	1	3	9	3	9		3			9		1					7
E9									9							9						7
E10	9		9	1	1	1	3		1	9												8
E11											9		1	9								9
E12												9										9
E13											3		9									9
E14													3	9								9
E15	9		1	3	1		1			1		3			9	9	1					7
E16																	3					7
E17														1			3	9		1		9
E18																			9			4
E19																		3		9		9
E20																		9		9	9	9
Occ of risk	6	6	2	2	3	2	3	4	1	4	1	5	1	2	3	2	2	5	6	2	1	
ARP	1476	378	380	350	459	192	633	276	92	696	108	615	117	342	378	252	124	945	216	342	81	
Priority Ranking	1	8	7	10	6	16	4	13	20	3	19	5	18	11	9	14	17	2	15	12	21	

Source: Primary data processed, 2023

Based on table 5, the phase 1 HOR model shows that the result of the risk source with the highest ARP value is the A1 risk source, which is an error in warehousing management. The source of the risk is A21, which is a complaint from a customer. After obtaining a dominant risk agent, the next step is to conduct a risk evaluation.

House of Risk Fase 2

House of Risk Phase 2 analysis is used to carry out risk control strategies or formulate mitigation measures. Mitigation measures are actions that are expected to reduce the impact of *risk agents* before risks occur. Mitigation actions are planned and prepared based on the results of *brainstorming* between *experts* and researchers. Some mitigation measures are search results based on multiple references and other sources. This planning also takes into account the level of difficulty to be applied and the effectiveness of the action based on interviews or filling out questionnaires with experts.

Based on the results of the HOR phase 1 analysis, there are 3 dominant risk agents that occur in UD. Al-Manshurien. *Dominant Risk Agent* shown in Table 5 below:

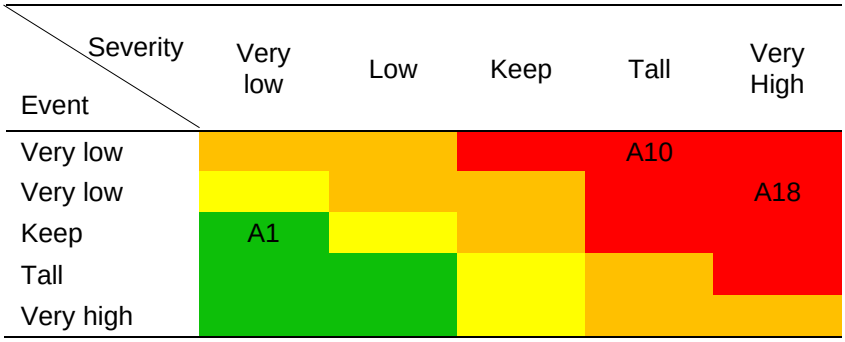
Table 5 Identification of dominant risk agents

ARP Rating	Code	Risk Agent	ARP	Oj	The
1	A1	Mismanagement of warehousing	1476	6	2
2	A18	Less packaging shipping	945	5	9
3	A10	No recording of raw material stock	696	4	8

Source: Primary data processed, 2023

After identifying the dominant risk agents, risk mapping is carried out using a risk *matrix*. The mapping aims to determine the risk conditions before the implementation of risk management strategies. The position of the dominant risk sources can be shown in the following table 6:

Table 6 Position of the dominant source of risk



Source: Primary data processed, 2023

The creation of the risk matrix is carried out based on Table 7 below:

Table 7 Determination of risk matrix levels

Rank	Severity	Event
Very Low	1-4	1-4
Low	5	5
Keep	6	6
tall	7-8	7-8
Very High	9-10	9-10

The risk map shows that A1 is located in a *low-risk position* in green which means it is set according to routine procedures. Meanwhile, A18 and A10 are in *a high-risk* position with a red color which means that it requires research and management consideration at the leadership level. The dominant risk outcome identified from HOR phase 1 is mitigation measures. HOR phase 2 is a risk mitigation

strategy that is determined through brainstorming with experts and using references from related research. Table 8 represents the proposed mitigation action plan:

Table 8 Risk mitigation plan

No	*Risk Agent*	Handling Strategies	Code
1		Make notes related to warehousing stock and product stock	PA1
2	Mismanagement of warehousing	Conduct regular monitoring per week to prepare for production one week ahead	PA2
3		Design warehousing management by separating the available raw materials	PA3
4	More economical packaging delivery products	Making product packaging before shipment safer like sterosomal ice boxes so that when the product is shipped when it is cold, it does not melt quickly	PA4
5		Always carry out *product quality control* before sending to consumers	PA5
6	No recording of raw material stock	Keep a record of raw material stock	PA6
7		Carry out raw material inventory management so that the first incoming raw material and the first issued raw material (FIFO) can be determined	PA7
8		Carry out production planning	PA8

Source: Primary data processed, 2023

After identifying the risk management strategy, the next step is to measure the correlation value between mitigation actions and risk *agents*. This assessment was carried out through filling out questionnaires and interviews with *experts*.

The following is the formula to determine the total effectiveness value *:*

$$TEk=\sum ARP_j . Ejk$$

Information:
Tech : The effective sum of each action
ARPj : Potential Aggregate Risk
Ejk : Correlation between every precaution and every risk agent

The calculation of the TEk is as follows:
∑ARPj.Ejk
TE1= (1476x9)+(1x945)+(9x696)
TE1= 20493

After obtaining the total effectiveness value, then determine the effectiveness to difficulty ratio value to determine the effectiveness and difficulty ratio in carrying out each mitigation action. The formula used is as follows:

$$ETDk = TE_k/Dk$$

Information:
ETDk : Total effectiveness of difficulty level
Single : The sum of the effectiveness of each action
Dk : Difficulty level
The ETDk calculation is as follows:

ETDk = TEK/MIN
ETDk = 20493/3
ETDk = 6831

Table 9 HOR Stage 2

Source of Risk		Handling Strategies								ARP
		PA1	PA2	PA3	PA4	PA5	PA6	PA7	PA8	
A1	Mismanagement of warehousing	9	9	3	1		9	9	3	1476
A18	Less packaging shipping	1			3	9				945
A10	No recording of raw material stock	9	9	9			9	3	3	696
Single		20493	19548	10692	4311	8505	19548	15372	6516	
Dk		3	4	5	5	3	5	5	3	
ETDk		6831	4887	2138	862.2	2835	3910	3074	2172	
Peringkat		1	2	7	8	5	3	4	6	

Source: Primary data processed, 2023

Based on the results of the Phase 2 HOR processing, a sequence of mitigation strategies based on the highest ETDk value was obtained. The following is a priority table *of* mitigation strategy rankings based on *the calculation of* phase 2 risk houses:

Table 10 Priority Order of Mitigation Measures

Code	Mitigation Strategies	Priority
PA1	Make notes related to warehousing stock and product stock	1
PA2	Conduct regular monitoring per week to prepare for production one week ahead	2
PA6	Keep a record of raw material stock	3
PA7	Carry out raw material inventory management so that the first incoming raw material and the first issued raw material (FIFO) can be determined	4
PA5	Always carry out *product quality control* before sending to consumers	5
PA8	Carry out production planning	6
PA3	Design warehousing management by separating the available raw materials	7
PA4	Making product packaging before shipment safer like sterosomal ice boxes so that when the product is shipped when it is cold, it does not melt quickly	8

Source: Primary data processed, 2023

Based on the priority order of risk mitigation, it was found that the Handling Strategy (PA1) made records related to warehousing stock and product stock. This is used to make it easier for owners and employees to know the number of product stock availability and warehousing stock and make it easier to plan the re-production process. Handling strategy (PA2) Conduct regular monitoring per week to prepare for production one week ahead. This strategy will make it easier to plan the

production process and estimate when the right time is to do the next production. The third handling strategy that is easy to implement by the owner, namely (PA6) makes a record of raw material stock. This strategy is used to make it easier for owners to know the number of raw material stocks for production that have come in and out (have been used). The handling strategy that is currently difficult for companies to implement is (PA4) to make the packaging of products before shipment safer like sterofoam ice boxes so that when the product is shipped when it is cold, it does not melt quickly. This is due to the consideration of the capacity of the product being sent with the sterosomal capacity of the ice box and the vehicle used for delivery is a motorcycle so that the owner still has difficulties if he has to use the sterosomal ice box.

DISCUSSION

The results of the identification of risk events and risk agents that occurred in UD. Al-Manshurien was obtained from the results of interviews and filling out questionnaires with experts in their fields. From the results of risk identification carried out in five business processes, namely plan, source, make, send, and return. This is also in line with the research conducted which also uses five business processes. In the business process, as many as 20 risk events are obtained that are likely to occur. In the planning process, there are two activities with three risk events coded E1, E2, and E3. In the source process, there are also two activities with four risk events that have codes E4, E5, E6 and E7. In the creation process, there is one activity with eight risk events that have codes E8, E9, E10, E11, E12, E13, E14, and E15. In the delivery process, there is one activity with three risk events that have codes E16, E17 and E18. Finally, in the return process, there are two activities with two risk events that have codes E19 and E20. In the identification of these risk events, there are several risk events that have a severity value of 9, namely in codes E5, E6, E12, E13, E14, E17, E19 and E20. This is because, according to the respondents, these risk events have a serious impact on the business activities carried out. The risk event with the lowest severity value is in code E1 with a severity value of 2 because it is considered that the risk event has a very small effect. Waluyo (2021) and Al- Basthomi (2023)

Based on observations and interviews, it can be identified that there are 21 risk agents that affect the supply chain at UD. Al-Manshurien which has codes A1-A21. The risk agents with the highest event values are in codes A1, A2 and A16 with event values of 6 where the probability of the event level is moderate. For risk events with the lowest event values, namely A9, A11, A13 and A21 with an event value of 1, which means that the level of occurrence is almost uncertain.

In the House of Risk analysis phase 1, three dominant risk agents were produced, namely (A1) warehousing management errors with an ARP value of 1476. Risk agent A1 on this risk position map is low risk where the severity value is small and the occurrence value is moderate. In warehousing management, there are several things that need to be considered, including the availability of storage warehouses, how storage conditions are in the warehouse, and the process of incoming and outgoing goods. So far, UD Al-Manshurien already has a storage area for finished products before being marketed to consumers. The storage area is in the form of a refrigerator where there are several variants of products that have been placed separately. For the process of managing incoming products, in this effort applies the FIFO principle. The next dominant risk agent (A18) does not have safety packaging on shipments with an ARP value of 945. Risk agent A18 on this risk position map is red (high risk) where this position requires immediate handling. This

is because in this business when the delivery is only carried with a plastic cracker and lined with a bag. This is certainly less safe because seeing that if the delivery is far enough, it will make the drink no longer cold after arriving at the destination. In addition, it is also worried that when the plastic used is not strong and torn, it will have an impact on the products sent. The next dominant risk agent, namely (A10), does not have a stock record of raw materials with an ARP value of 696. The A10 risk agent on this risk position map is red (high risk) and requires immediate action. If not handled immediately, this can result in the owner having difficulty knowing the total raw materials available, the total raw materials that come in and the total raw materials used. So if suddenly there is a large order, the owner cannot fulfill the order request in a short time.

Based on the results of the HOR phase 2 analysis, three priority risk management strategies that are more effective and easier to apply to UD are obtained. Al-Manshurien. The first priority handling strategy is (PA1) to make records related to warehousing stock and product stock with an ETDk value of 6831. This is easy to apply to UD business. Almanshurien because it has the highest ETDk value and has the lowest Dk value of 3. A Dk 3 value means that the risk management strategy has a low level of difficulty or is easy to implement in business. This statement is also supported by research conducted by where a score of 3 on the assessment of the management strategy shows that the level of difficulty in implementation is low. Handling strategy (PA2) Conduct Young (2022) regular monitoring per week to prepare for production one week ahead with an ETDk value of 4887. This monitoring activity needs to be carried out periodically to monitor the availability of raw materials so that the production process can run smoothly. This is easy for the owner to do because the raw materials have been separated and arranged neatly so that they are easy to monitor. The third handling strategy that is easy to implement by the owner, namely (PA6) makes a recording of raw material stock with an ETDk value of 2138. Recording raw material stock is also easy to do, because we can find out the total availability of raw materials in the warehouse. This will certainly facilitate the production process and make it easier to estimate production when there is a sudden demand from consumers.

CONCLUSION

Based on the results of the analysis, 20 risk events and 21 risk agents were obtained in supply chain activities at UD. Al-Manshurien. The results of the calculation of the House of Risk phase 1 model show that there are three dominant risk agents that have high ARP values, namely (A1) for warehousing management problems, (A18) lack of safety packaging on shipping and (A10) no recording of raw material stocks. An easy-to-implement risk management strategy based on three dominant risk agents as many as 8 handling strategies. Of the 8 strategies, taking into account the level of effectiveness, there are three priority risk management strategies with the highest ETDk value, namely (PA1) making records related to warehousing stock and product stock, (PA2) conducting routine monitoring per week to prepare for production one week ahead, and (PA6) making records of raw material stocks.

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REFERENCE

Al-Basthomi, M.Y. (2023) 'Risk Management of the Supply Chain of Milkfish Processed Products at UD. Arshaindo uses the House Of Risk' method, 4(1).

Ardiansyah, N. and Nugroho, S. (2022) 'Implementation of the House Of Risk (HOR) Method in Supply Chain Risk Management of Seat Track Adjuster 4L45W Products (Case Study: PT XYZ)', *SENIATI* [Preprint].

Azhra, F.H. (2021) *Risk Analysis and Mitigation Action Plan in the Supply Chain Using the HOR (House Of Risk) and Dynamic System Method (Case Study: Mushroom Savvy MSMEs).*

Dewi, R.P.A. and Suprapti, I. (2022) 'Analysis of Supply Chain Management and Marketing Efficiency of UD Corn Chips. Tajul Anwar Jaya', *AGRISCIENCE,* 2.

Cooperatives and Micro Enterprises Office (2023) *Bangkalan Regency MSME Data*. Bangkalan.

Hairul (2020) *Risk Management*. Yogyakarta: CV Budi Utama.

Hanim, L. and Noorman, MS. (2018) *MSMEs (Micro, Small & Medium Enterprises) & Business Forms*. Semarang: UNISSULA PRESS.

Heryani (2022) 'Chasing the 2024 Halal Mandatory Deadline', *Journal of Halal Halal Is My Life*, pp. 1–44.

Laili, D.N.F. and Fajar (2022) 'Problem Analysis of the Implementation of Halal Certification for MSME Actors in Bangkalan', *Masyrif: Journal of Economics, Business and Management*, 3(1), pp. 147–155. Available at: https://doi.org/10.31000/almaal.v2i1.2803.

Makbul, M. (2021) *Data Collection Methods and Research Instruments*.

Noor, R.F. (2022) *Risk Analysis in the Operations of Lullabic Convection MSMEs in Yogyakarta Using the Hose of Risk (HOR) Method*.

Novita, T. (2017) *Risk Management*. Malang: Media Nusa Creative.

Nuraliyah, M.I., Adiba, E.M. and Amir, F. (2023) 'Halal Certification Decision by MSMEs in Bangkalan (Does Religiosity and Certification Cost Affect?)', *Journal of Civilization Administration*, 3.

Prawiyogi, A.G. *et al.* (2021) 'The Use of Big Book Media to Foster Reading Interest in Elementary Schools', *Basicedu Journal*, 5(1), pp. 446–452. Available at: https://doi.org/10.31004/basicedu.v5i1.787.

Saputri, O.B. (2020) 'Mapping Indonesia's Potential as the Center of the World's Halal Industry', *Jurnal Masharif al-Syariah: Journal of Sharia Economics and Banking*, 5, pp. 23–38. Available at: http://journal.um-surabaya.ac.id/index.php/Maqasid.

Thian, A. (2021) *Business Risk Management*. Edited by Corolus Vian. Yogyakarta: Andi Publishers.

Ulfah, M. (2022) 'Mitigating the risk of the supply chain of the cake industry using house of risk', Journal of *Industrial Services*, 8(1), p. 63. Available at: https://doi.org/10.36055/jiss.v8i1.14315.

Waluyo, M.T. (2021) *Risk Mitigation Analysis Using the House Of Risk (HOR) Model on CV. Tunas Karya*.

Yusuf, M. (2017) *Quantitative, Qualitative & Combined Research Methods*. Jakarta: Kencana.

WILDAN, M. A., IMRON, M. A., SYARIF, M., & JAKFAR, A. A. (2021). Palm oil export management and dynamic macroeconomic. Journal of Tianjin University Science and Technology, 54, 51-63.

Marita, L., Arief, M., Andriani, N., & Wildan, M. A. (2021). Strategy for Improving the Welfare of Indonesian Farmers, Strategic Management Review. Agrieconomics, 10 (1), 1–18.

Rasyid, M., Kristina, A., Wantara, P., Jumali, M.A. (2023). Household Participations and Sustainable Development Programs: Social Impact of Government Assistance in Indonesia. International Journal of Sustainable Development and Planning. Vol. 18, No. 6, June, 2023, pp. 1725-1732

Priyadi, U., Atmadji, E., Artiani, L. E., Nordin, S. M., Abdullah, M. R. T. L., Imron, M. A., ... & Omar, R. C. (2022). Sustainable Energy Economic Policy: Population, Energy Consumption, and Macroeconomic Conditions. International Journal of Energy Economics and Policy, 12(6), 80.

Safrizal, H. B. A. (2023). Innovative Behavior as an Antecedent of Employee Performance. resmilitaris, 13(3), 904-915.