



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

Nunik Sri Wahyuni¹, Isdiana Suprapti²

^{1,2} Program study of Agribusiness, Department of Agricultural Science and Technology, Faculty of Agriculture, Universitas Trunojoyo Madura, Bangkalan, Indonesia

INFO ARTIKEL

Abstract

Keywords:

House of Risk, Risk Management, Supply chain

UD. Al-Manshurien is one of the halal product MSMEs in Bangkalan and is engaged in the traditional herbal drink processing industry. This business unit processes raw materials into finished or semi-finished materials until they reach the hands of consumers who are closely related to the supply chain. In supply chain activities, it is very possible for risks to occur and the impact of these activities can cause negative consequences or large losses if left unchecked. It is necessary 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 at UD. Al-Manshurien. The methods used are supply chain mapping and House of Risk (HOR) analysis. The results of the study using HOR analysis contained three dominant risk agents, namely (A1) warehousing mismanagement, (A18) less safety packing of product delivery, and (A10) No recording of raw material stocks. Risk management strategies that become alternatives with consideration of effectiveness in its application are making records related to warehousing stock and product stock (PA1), conducting regular monitoring to check warehousing inventory and product inventory (PA2), and making raw material stock recording (PA3).

✉ Corresponden Author
(*) Author

Email:
200321100059@student.trunojoyo.ac.id^{1*},
isdiana@trunojoyo.ac.id^{2*}

E-ISSN: 3026-0965

DOI :

INTRODUCTION

Indonesia is a country with the largest Muslim population in the world. Menurut laporan *The Royal Islamic Strategic Studies Center* (RISSC) said that 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 (Laili and Fajar, 2022). As a country that has the largest Muslim citizens in the world, Indonesia also has the ability to become the largest halal food producer in the world. Based on The Global Islamic Economy Indicator in the *State of the Global Islamic Economy* (SGIE) Report 2022, Indonesia occupies the second position in the halal food product sector (Indonesia Sharia Economic Festival, 2022). Currently, halal industry trends are a hot topic in international business. Producing processed products both food, beverages, cosmetics and other products that are safe and halal is a very promising business for the Muslim community by using halal certification and labeling. The halal industry which has become a lifestyle in the community supports the development of the halal industry in Indonesia with value-added aspects of the existence of various cultures in Indonesia (Saputri, 2020). This is supported by the government's policy related to mandatory halal 2024. Where all goods and services marketed and circulated in Indonesia must have a halal certificate (Heryani, 2022). Therefore, MSMEs are now flocking to register halal certification for the products they market.

Micro, Small and Medium Enterprises (MSMEs) in Indonesia contribute to Gross Domestic Product (GDP) of 59.08% or worth Rp 4,869.57 trillion with a growth rate of 6.4% per year (Hanim and Noorman, 2018). This is supported by data on the contribution of MSMEs in exports, which is 14.37% and in trade in ASEAN, MSMEs play a role of 6.3% (Nuraliyah, Adiba and Amir, 2023). So that MSMEs in Indonesia have an important role in economic growth and development.

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

UD. Al-Manshurien is one of the small industries engaged in the health drink processing industry. This MSME produces various types of health drinks such as jamu turmeric asam, telang flowers, pokak, kencur rice, betel nut, dried lemon, temulawak and many more. This health drink is marketed in powder form and ready-to-eat drinks under the brand Naturna. In some 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 starting from obtaining raw materials, processing to becoming finished products and distributed to consumers (Azhra, 2021). *Supply Chain Management* (SCM) is a chain cycle that is very related starting from the supplier of raw materials to the company which is then distributed to the end consumer (Dewi and Suprpti, 2022). According to Ardiansyah & Nugroho (2022) The supply chain is one of the most important sectors in a business because it is related to product distribution patterns. In supply chain activities, it is very possible for risks and impacts arising from these activities can cause negative consequences or large losses if left unchecked. So it is necessary to identify and risk handling strategies so that business performance can be maximized.

In general, risk is assessed as something negative such as consequences, loss or danger. According to Tian (2021) Risk is an event or event that if it occurs

can slow down the achievement of goals or objectives of a company caused by internal and external factors. According to Novita (2017) Risk is the possibility of an unexpected event that if it occurs can harm the company. From this opinion, it can be concluded that risk is an uncertainty of events that if they occur can harm the company. Risk can be caused by internal or external factors of a company. Risk management is an activity to manage risk by monitoring risk triggers, tracking, and efforts to minimize risk (Waluyo, 2022). According to Hairul, (2020) Risk management is a process of identifying, measuring risks, and developing strategies to manage existing resources and can be used to transfer risks 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 risk so that it can be controlled, managed and minimized losses. The risk management process includes risk identification using brainstorming techniques, surveys, interviews, historical information, working groups and others. After identification, risk analysis can be carried out.

Model *House of risk* (HOR) is an analytical tool designed to identify, analyze, evaluate risk and plan risks in the company's supply chain (Ulfah, 2022). This HOR method is a development of the *Quality Function Deployment* (QFD) method, where this model uses the *House of Quality* (HOQ) to develop risk management strategies in overcoming risks that have the potential to arise in the supply chain. According to Ulfah, (2022) The HOR method has several stages including setting probabilities for the risk list, and the severity of the risk. Risk events can be induced from a single list of risks, thus requiring an *aggregate quantity of risk potential* from the source of risk. If the probability of occurrence of risk list j is O_j , the impact of *risk event* i occurs is S_i , and the correlation value between the two is R_{ij} .

Based on this, it is necessary to do supply chain mapping to find out its activities from *source, plan, make, deliver and return* 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 agent* in the business. HOR phase 2 analysis is used to formulate effective risk management strategies to be implemented within the company. So if this research is not carried out, the company will find it difficult to anticipate future business risks. Therefore, companies need to prepare and plan risk handling strategies so that companies are better prepared to face risks in the future.

RESEARCH METHODS

The data used in the 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 was by observation, interview, documentation and filling out questionnaires. Observation is one method of collecting data carried out by researchers by observing, seeing, hearing and inferring from human behavior, work processes, natural symptoms and respondents who are not too large (Makbul, 2021). Observations were made by making direct observations to the research location, namely at UD. Al-Manshurien.

Data analysis used to identify supply chain risks and risk management strategies was carried out using *the House Of Risk* (HOR) method. Interview is a process of interaction between interviewers and resource persons through direct communication or face-to-face conversation (Yusuf, 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 methods of data collection 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 method of data collection carried out by providing several questions related to research in writing (in the form of *hardfile*, *softfile* and *link form*) (Prawiyogi *et al.*, 2021). This study used questionnaires to obtain values from *risk events*, *risk agents*, the correlation of the two, and the effectiveness of implementing risk management strategies.

Data analysis used to identify supply chain risks and risk management strategies is using the *House Of Risk* (HOR) method. Risk listing and *house of risk phase 1* calculations are used to identify risks and analyze the dominant *risk agents* in the business. HOR phase 2 analysis is used to formulate effective risk management strategies to be implemented within the company.

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

$$ARP_j = O_j \sum S_i R_{ij}$$

Information:

ARP_j : *Aggregate Risk Potential*

O_j : *Occurrence level of risk*

S_i : *Severity level of risk*

R_{ij} : Value the correlation between risk and risk agent

$$TE_k = \sum ARP_j E_{jk} K_j$$

Information:

TE_k : The amount of effectiveness of each action

ARP_j : *Aggregate Risk Potential*

E_{jk} : Correlation between each prevention action and each 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 at Jl. Yakurt Blok ED/2, Taman Gili Housing, East Gili Village, Kamal District, Bangkalan Regency. The name of the product produced by UD. Al-Manshurien is a product of NATURNA which was previously named 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, betel nut, and temulawak. As for powder products offered, among others, empon-empon, ginger emprit, pokak, celery mix, star fruit leaf mix, and lemongrass mix.

On UD. Al-Manshurien has 7 production activities carried out. Here 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
<i>Plan</i>	Production planning	C1
	Availability control	C2
<i>Source</i>	Delivery of raw materials from the supply chain	C3
	Procurement of raw materials	C4
<i>Make</i>	Production process	C5
<i>Deliver</i>	Product delivery to consumers	C6
<i>Return</i>	Product returns	C7

Source: Processed primary data, 2023

Risk identification

After identifying risks to supply chain activities that occur at 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 questionnaires to provide impact assessments related to *risk events* with *experts*.

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

Table 2 Risk Event Identification

Process	Activity	Risk Event	Code	Severity
<i>Plan</i>	Production planning	Abrupt changes in production plans	E1	2
		Abrupt changes in production plans	E2	7
	Setup Handling	Out of stock in the warehouse	E3	8
<i>Source</i>	Delivery of raw materials from suppliers	Disruption of raw material supply	E4	8
		Delays in the supply of raw materials from suppliers	E5	9
	Procurement of raw materials	The existence of raw materials that have quality below standard	E6	9
		Raw material prices are rising	E7	7
<i>Make</i>	Production Process	Delay in production execution	E8	7
		Lack of machine maintenance	E9	7
		Insufficient raw materials for production	E10	8
		Washing of unclean raw materials	E11	9
		Lack of manpower when	E12	9

		demand is high		
		Damage to rejec products	E13	9
		Damage during packaging	E14	9
		The production process is disrupted	E15	7
		Delays in product delivery to consumers	E16	7
<i>Deliver</i>	Product delivery to consumers	Product damage during shipping	E17	9
		Consumers cannot come at any time to the production house	E18	4
<i>Return</i>	Product returns	Return of defective products	E19	9
		Complaints from customer	E20	9

Source: Primary data processed, 2023

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

Table 3 Identify sources of risk

Process	Activity	Risk Agent	Code	Occurrence
<i>Plan</i>	Production planning	Warehousing mismanagement	A1	6
		Absence of financial records	A2	6
	Setup Handling	Absence of regular monitoring of warehouse inventory	A3	2
<i>Source</i>	Delivery of raw materials from suppliers	Stock from suppliers is empty	A4	2
		Raw material delivery constraints (natural/technical factors)	A5	3
	Procurement of raw materials	Some raw materials rot because they are stored for too long	A6	2
		The rarity of the raw material	A7	3
Error calculating product stock		A8	4	
<i>Make</i>	Production Process	Lack of monitoring of production machines	A9	1
		No recording of raw material stocks	A10	4
		Lack of <i>Quality control</i>	A11	1
		Lack of human resources	A12	5
		Production errors	A13	1
		Employee negligence	A14	2
		Power outage	A15	3
<i>Deliver</i>	Product delivery to consumers	Ruak/malfunctioning production machine	A16	2
		Natural factors as well as technical factors	A17	2
		Less <i>safety packing</i> product delivery	A18	5
		The absence of employees who specialize in the administration or shopkeepers	A19	6

<i>Return</i>	Product returns	Damage during delivery	A20	2
		Products are less in line 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 processing with two phases. HOR phase 1 aims to determine the risk *agent* (source of risk) that is a priority to be given a solution using HOR phase 2. The initial step applied in processing data is to identify risks and risk agents, then provide risk scores in the form of *severity*, *occurrence* and *correlation* values and calculate *Aggregate Risk Potential* (ARP) to determine the risks to be given solutions based on the ARP value obtained.

House of Risk Fase 1

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

$$ARP_j = O_j \sum S_i R_{ij}$$

$$ARP_1 = 6 [(9 \times 2) + (9 \times 8) + (3 \times 7) + (9 \times 8) + (9 \times 7)]$$

$$ARP_1 = 1476$$

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

After that create a *house of risk table*. HOR table phase 1 is the final stage of the risk identification process. The table shows the *severity* value of a risk event, the occurrence of a risk source and also the correlation between the risk event and the risk source obtained based on the results of interviews and filling out questionnaires with *experts*. Not only that, this phase one HOR table also shows the results of calculating the *Aggregate Risk Potential* (ARP) value of the *Risk Agent* and also the ranking of *Risk Agents* which are priorities for risk mitigation. The following table 4 is the HOR phase 1 model table:

Table 4 Model HOR Phase 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	3	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		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	

Sumber: Data primer diolah, 2023

Based on table 5, the HOR phase 1 model shows that the result of the risk source with the highest ARP value is the source of risk A1, namely errors in warehousing management. As for the source of risk is A21, which is a complaint from the 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 conduct risk control strategies or formulate mitigation actions. Mitigation actions are actions that are expected to reduce the impact of risk agents before the risk occurs. Mitigation actions are planned and prepared based on the results of brainstorming between experts and researchers. Some mitigation actions are the result of searches based on multiple references and other sources. This planning also takes into account the level of difficulty to be applied and the effectiveness of actions based on interviews or filling out questionnaires with experts.

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

Table 5 Identify dominant risk agents

ARP Rating	Code	Risk Agent	ARP	Oj	Si
1	A1	Warehousing mismanagement	1476	6	2
2	A18	Less safety packing shipping	945	5	9
3	A10	No recording of raw material stocks	696	4	8

Source: Processed primary data, 2023

After identifying the dominant risk *agent*, then 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 source can be shown in the following table 6:

Table 6 Position of dominant risk source

Severity \ Occurrence	Very low	Low	Medium	High	Very High
Very low				A10	
Very low					A18
Medium	A1				
High					
Very high					

Source: Primary data processed, 2023

Risk matrix creation is carried out based on Table 7 below:

Table 7 Determination of risk matrix levels

Rank	Severity	Occurrence
Very Low	1-4	1-4
Low	5	5
Medium	6	6
high	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 that it is regulated according to routine procedures. While A18 and A10 are in a *high risk* position with red which means it requires research and management consideration at the leadership level. The dominant risk outcomes identified from HOR phase 1 will be mitigation actions. HOR phase 2 is a risk mitigation strategy 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	Strategi Penanganan	Kode
1		Make records related to warehousing stock and product stock	PA1
2	Warehousing mismanagement	Conduct regular monitoring per week to prepare for production one week ahead	PA2
3		Design warehousing management by separating between available raw materials	PA3
4	Less safety packing shipping products	Making product packing before shipping is even more <i>safety</i> such as ice sterosomal boxes so that when the product is shipped when cold it does not melt quickly	PA4

5		Always carry out <i>product quality control</i> before being sent to consumers	PA5
6	No recording of raw material	Make a record of raw material stock	PA6
7	stocks	Conduct raw material inventory management so that the first incoming raw materials and the first issued raw materials (FIFO) can be determined	PA7
8		Conduct production planning	PA8

Source: Processed primary data, 2023

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

Here's the formula to determine the total effectiveness value :

$$TE_k = \sum ARP_j \cdot E_{jk}$$

Information:

TE_k : The effective amount of each action

ARP_j : Aggregate Risk Potential

E_{jk} : Correlation between each prevention action and each risk agent

Perhitungan TE_k sebagai berikut:

$$TE_k = \sum ARP_j \cdot E_{jk}$$

$$TE_1 = (1476 \times 9) + (1 \times 945) + (9 \times 696)$$

$$TE_1 = 20493$$

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

$$ETD_k = TE_k / D_k$$

Information:

ETD_k : Total effectiveness of difficulty degrees

TE_k : The amount of effectiveness of each action

D_k : Degree of difficulty

The ETD_k calculation is as follows:

$$ETD_k = TE_k / D_k$$

$$ETD_k = 20493 / 3$$

$$ETD_k = 6831$$

Table 9 HOR Phase 2

Sources of Risk	Handling Strategy								ARP
	PA1	PA2	PA3	PA4	PA5	PA6	PA7	PA8	
A1 Warehousing mismanagement	9	9	3	1		9	9	3	1476
A18 Less safety packing shipping	1			3	9				945
A10 No recording of raw material stocks	9	9	9			9	3	3	696

TE _k	20493	19548	10692	4311	8505	19548	15372	6516
D _k	3	4	5	5	3	5	5	3
ETD _k	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 HOR Phase 2 processing, a sequence of mitigation strategies was obtained based on the highest ETD_k value. The following is a table of rank priorities of mitigation strategies based on the calculation of house of risk phase 2:

Table 10 Priority Order of Mitigation actions

Code	Mitigation Strategies	Prioritas
PA1	Make records related to warehousing stock and product stock	1
PA2	Conduct regular monitoring per week to prepare for production one week ahead	2
PA6	Make a record of raw material stock	3
PA7	Conduct raw material inventory management so that the first incoming raw materials and the first issued raw materials (FIFO) can be determined	4
PA5	Always carry out <i>product quality control</i> before being sent to consumers	5
PA8	Conduct production planning	6
PA3	Design warehousing management by separating between available raw materials	7
PA4	Making product packing before shipping is even more <i>safety</i> such as ice sterosomal boxes so that when the product is shipped when cold it does not melt quickly	8

Source: Primary data processed, 2023

Based on the priority order of risk mitigation, it is found that the Handling Strategy (PA1) makes records related to warehousing stocks and product stocks. This is used to make it easier for owners and employees to find out the amount of product stock availability and warehousing stock and make it easier to plan the production process again. 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 is the right time to do the next production. The third handling strategy whose application is easy for owners to do, namely (PA6) makes a recording of raw material stocks. This strategy is used to make it easier for owners to know the amount of stock of production raw materials that enter and leave (have been used). The handling strategy that is currently difficult to implement by the company is (PA4) making product packing before shipping even more *safety* such as ice sterofom boxes so that when the product is shipped when cold does not melt quickly. This is because the consideration of the capacity of the product shipped with the sterosomal capacity of the ice box and the vehicle used for delivery is a motor so that the owner still has difficulty if he has to use the ice sterosomal box.

DISCUSSION

The results of identifying risk events and risk agents that occur at 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, deliver and return. This is also in line with research conducted by Waluyo (2021) dan Al-Basthomi (2023) 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 plan 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 the codes E4, E5, E6 and E7. In the make process, there is one activity with eight risk events that have codes E8, E9, E10, E11, E12, E13, E14, and E15. In the deliver process, there is one activity with three risk events that have the codes E16, E17 and E18. Finally, in the return process, there are two activities with two risk events that have the codes E19 and E20. In this risk event identification, there are several risk events that have a severity value of 9, namely in the codes E5, E6, E12, E13, E14, E17, E19 and E20. This is because, according to the respondents, the risk event has a serious impact on the business activities carried out. The risk event with the lowest severity value is in the E1 code with a severity value of 2 because it is considered that the risk event has a very small effect.

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 the code A1-A21. Risk agents with the highest occurrence value are in codes A1, A2 and A16 with a occurrence value of 6 where the probability of the occurrence rate is moderate. For risk events with the lowest occurrence value, namely A9, A11, A13 and A21 with an occurrence value of 1 which means that the level of occurrence is almost not certain to occur.

In the House of Risk phase 1 analysis, three dominant risk agents were produced, namely (A1) warehousing mismanagement with an ARP value of 1476. This A1 risk agent on the risk position map is at low risk where the severity value is small and the occurrence value is medium. In warehousing management, there are several things that need to be considered including the availability of storage warehouses, how storage conditions in warehouses, 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 in which there are several variants of products that have been placed separately. For the process of managing incoming products, in this effort apply the FIFO principle. The next dominant risk agent (A18) lacks safety packing on shipments with an ARP value of 945. This A18 risk agent on the risk position map is in red (high risk) where this position needs immediate treatment. This is because in this business when shipping is only carried with plastic crackle and lined with bags. This is certainly less safety because seeing if the delivery is far enough it will make the drink no longer cold after arriving at the destination. In addition, it is also feared that when the plastic used is less strong and tearing will have an impact on the products sent. The next dominant risk agent, namely (A10), has no recording of raw material stocks with an ARP value of 696. This A10 risk agent on the risk position map is in red (high risk) which requires immediate treatment. If not handled immediately, this can result in the owner having difficulty knowing the total raw materials available, the total raw materials that enter and the total raw materials used. So that if there is a large order suddenly, the owner cannot fulfill the order request in a fast time.

Based on the results of the phase 2 HOR analysis, three priority risk management strategies were obtained that were more effective and easier to apply to UD. Al-Manshurien. The first priority handling strategy is (PA1) to make records

related to warehousing stocks and product stocks with an ETDk value of 6831. This is easily applicable to UD businesses. Almanshurien because it has the highest ETDk value and has the lowest Dk value of 3. A value of Dk 3 means that the risk management strategy has a low level of difficulty or is easy to implement in the business. This statement is also supported by research conducted by Noor (2022) Where a value of 3 on the assessment of handling strategies indicates that the level of difficulty in application is low. Handling strategy (PA2) Conduct 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 regularly 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 it is easy to monitor. The third handling strategy whose application is easy for owners to do, namely (PA6) makes a recording of raw material stocks with an ETDk value of 2138. Recording raw material stocks 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 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 calculation results 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 packing on shipments and (A10) no recording of raw material stocks. Risk management strategies that are easy to implement based on three dominant risk agents as many as 8 handling strategies. Of the 8 strategies, considering the level of effectiveness, there are three priority risk handling strategies with the highest ETDk value, namely (PA1) making records related to warehousing stocks and product stocks, (PA2) conducting regular monitoring per week to prepare for production one week ahead and (PA6) making raw material stock records.

ACKNOWLEDGMENTS

The author expresses his gratitude for the great support to the Institute for Research and Community Service (LPPM) of Trunojoyo Madura University (UTM) for the independent research funding program. In addition, the author would also like to thank Mrs. Isdiana Suprapti, S.P., M.M as the supervisor, Mrs. Sri Endah Andajani as the Owner of UD. Al-Manshurien, Mr. Wondo and Mrs. Ovi selaku as the Employees at UD. Al-Manshurien who have been willing to be respondents, Ririn, Alfi, Dimas as colleagues in the MBKM Research team.

REFERENCE

- Al-Basthomi, M.Y. (2023) 'Pengelolaan Risiko Rantai Pasok Produk Olahan Bandeng Pada UD. Arshaindo Menggunakan Metode House Of Risk', 4(1).
Ardiansyah, N. and Nugroho, S. (2022) 'Implementasi Metode House Of Risk (HOR) Pada Pengelolaan Risiko Rantai Pasok Produk Seat Track Adjuster 4L45W (Studi Kasus : PT XYZ)', *SENIATI* [Preprint].

- Azhra, F.H. (2021) *Analisis Risiko dan Rencana Aksi Mitigasi Pada Rantai Pasok Menggunakan Metode HOR (House Of Risk) dan System Dynamic (Studi Kasus: UMKM Arif Jamur)*.
- Dewi, R.P.A. and Suprpti, I. (2022) 'Analisis Manajemen Rantai Pasok dan Efisiensi Pemasaran Keripik Jagung UD. Tajul Anwar Jaya', *AGRISCIENCE*, 2.
- Dinas Koperasi dan Usaha Mikro (2023) *Data UMKM Kabupaten Bangkalan*. Bangkalan.
- Hairul (2020) *Manajemen Risiko*. Yogyakarta: CV Budi Utama.
- Hanim, L. and Noorman, MS. (2018) *UMKM (Usaha Mikro, Kecil & Menengah) & Bentuk-Bentuk Usaha*. Semarang: UNISSULA PRESS.
- Heryani (2022) 'Mengejar Tenggat Mandatory Halal 2024', *Jurnal Halal Halal Is My Life*, pp. 1–44.
- Indonesia Sharia Economic Festival (2022) *SGIE Report 2022: Makanan Halal Indonesia Peringkat Dua Dunia, ISEF (Indonesia Sharia Economic Festival 2022)*. Available at: <https://isef.co.id/id/artikel/sgie-report-2022-makanan-halal-indonesia-peringkat-dua-dunia/> (Accessed: 3 October 2023).
- Laili, D.N.F. and Fajar (2022) 'Analisis Problematika Pelaksanaan Sertifikasi Halal Bagi Pelaku UMKM di Bangkalan', *Masyrif: Jurnal Ekonomi, Bisnis dan Manajemen*, 3(1), pp. 147–155. Available at: <https://doi.org/10.31000/almaal.v2i1.2803>.
- Makbul, M. (2021) *Metode Pengumpulan Data dan Instrumen Penelitian*.
- Noor, R.F. (2022) *Analisis Risiko Pada Operasional UMKM Konveksi Lullabic Yogyakarta Menggunakan Metode Hose of Risk (HOR)*.
- Novita, T. (2017) *Manajemen Risiko*. Malang: Media Nusa Creative.
- Nuraliyah, M.I., Adiba, E.M. and Amir, F. (2023) 'Keputusan Sertifikasi Halal oleh Umkm di Bangkalan (Apakah Religiusitas dan Biaya Sertifikasi Berpengaruh?)', *Jurnal Tadbir Peradaban*, 3.
- Prawiyogi, A.G. et al. (2021) 'Penggunaan Media Big Book untuk Menumbuhkan Minat Membaca di Sekolah Dasar', *Jurnal Basicedu*, 5(1), pp. 446–452. Available at: <https://doi.org/10.31004/basicedu.v5i1.787>.
- Saputri, O.B. (2020) 'Pemetaan Potensi Indonesia Sebagai Pusat Industri Halal Dunia', *Jurnal Masharif al-Syariah: Jurnal Ekonomi dan Perbankan Syariah*, 5, pp. 23–38. Available at: <http://journal.um-surabaya.ac.id/index.php/Maqasid>.
- Thian, A. (2021) *Manajemen Risiko Bisnis*. Edited by Corolus Vian. Yogyakarta: Penerbit Andi.
- Ulfah, M. (2022) 'Mitigasi risiko rantai pasok industri kue menggunakan house of risk', *Journal Industrial Servicess*, 8(1), p. 63. Available at: <https://doi.org/10.36055/jiss.v8i1.14315>.
- Waluyo, K.G. (2022) *Manajemen Risiko: Tujuan, Kategori, dan Mitigasi, Kementerian Keuangan RI Direktorat Jendral Perbendaharaan*. Available at: <https://djp.kemenkeu.go.id/kppn/manokwari/id/data-publikasi/berita-terbaru/3030-manajemen-risiko-tujuan,-kategori,-dan-mitigasi.html> (Accessed: 18 September 2023).

- Waluyo, M.T. (2021) *Analisis Mitigasi Risiko Dengan Menggunakan Model House Of Risk (HOR) Pada CV. Tunas Karya.*
- Yusuf, M. (2017) *Metode Penelitian Kuantitatif, Kualitatif & Penelitian Gabungan.* Jakarta: Kencana.