RISK MITIGATION STRATEGIES FOR FISH SHREDDED PRODUCTION DUE THE IMPACT OF COVID-19 PANDEMIC

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A R T I C L E I N F O	ABSTRACT
Keywords: Production Risk, Fish Shredded, Covid-19	Micro and small businesses that produce variants of fish shredded products are faced with business uncertainty and losses due to the risks faced in the production process due to the impact of the covid-19 pandemic. The purpose of this study is to find out the risko variables and risk mitigation strategies for fish shredded production due to the impact of the Covid-19 pandemic. The analysis methods used are Failure Mode Effect Analysis (FMEA) and Analytical Hierarchy ProcessAHP). The results showed that the highest risks were rising raw material prices, fluctuating and uncertain production activities, and demand is fluctuating and tending to decline. Priority strategies alternative for minimizing risk are reformatting partnerships with raw material suppliers, improving inventory management, and planning and forecasting demand.
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1. Introduction

Fish shredded is a processed product of fishery made from fish meat, or processed fish that is seasoned. Shredded is processed by boiling, frying, pressing or separating oil. The resulting product has a soft shape, tastes good, and has a relatively long lasting power. A good type of fish for the manufacture of shredded is a type of fish that has coarse fiber and does not contain many thorns (Huthaimah, et., al, 2017). Micro and small Businesses in Situbondo Regency engaged in fish processing mostly produce more than one product variant and one of the product variants produced is fish shredded.

Micro and small businesses that produce fish shredded certainly never escape the risks, especially in the midst of the covid-19 pandemic that not only has an impact on the health sector but also has an impact on economic sectors such as the business world. According to Kountur (2016), risk is a potential probalility that causes losses or an uncertain situation faced by a person or company and can have a detrimental impact. The potential risks faced by micro and small businesses engaged in the business of fish shredded are certainly getting bigger with non-natural disasters of the Covid-19 pandemic, because according to Putnarubun (2021), the impact of the Covid-19 pandemic is very influential on the business world including the sluggish market indicated by the decline in transactions in the market, late distribution due to soacial distancing policies, declining turnover due to decreased people's purchasing power, and capital disrupted due to financial instability.

The risks faced by micro and small businesses that produce fish Shredded must be prevented and minimized so that micro and small businesses do not suffer losses. Risk prevention can be done by building a risk management system. According to Idroes (2011) risk management is defined as a logical and systematic method of identifying, quantifying, establishing attitudes, establishing solutions, and monitoring the risks that take place in each activity or process. Sholihin (2010) added that the purpose of risk management is to provide risk information to the regulator, ensure that there is no loss, minimize losses from various risks that are uncontrolled, measure exposure and risk concentration, allocate capital and limit risk. The management process has several steps, namely determining

objectives, identifying risks, determining risk measures, selecting technical analysis, implementation, and evaluation.

Micro and small businesses that produce variants of fish shredded products are faced with business uncertainty and losses due to the risks faced in the production process due to the impact of the covid-19 pandemic. Therefore, this study aims to find out the risko variables and risk mitigation strategies for shredded Shredded production due to the impact of the Covid-19 pandemic.

2. Methods

2.1 Research Procedure

The research stage is systematically designed to be in accordance with the purpose of the research and in accordance with the problem. This research consists of a number of stages, namely initial observation and discussion with micro and small business owners, literature studies, formulation of research problems, identification of variables, preparation of questionnaires, collection and processing of data, formulation of conclusions.

2.2 Identification of Variabel

There are two factors that are measured, namely risk factors and risk indicators. The measurement of the risks faced can be seen in Table 1.

TABLE 1
STUDY AND MEASUREMENT OF RISK OF FISH SHREDDED PRODUCTION DUE TO THE IMPACT OF THE COVID-19 PANDEMIC

Risk Factors	Risk Indicators
Risk of Raw Materials	• mobility and distribution of raw materials late • reduced supply of raw materials • Quality of raw materials decreases • Raw material prices rise • exposure to covid-19 due to contact with raw material suppliers
Production Risks	• fluctuating and uncertain production activities • production failures resulting in product defects • production operating costs increase • cleanliness and discomfort of the work environment • damage to machinery and equipment in the production process • decreased production productivity due to some of its workforce exposed to covid-19
Demand Risk	• demand of fish Shredded is fluctuating and tends to decrease • the competitors of Shredded fish • cancellation of fish Shredded reservations • return on sale of fish Shredded • delay in the distribution of fish Shredded • exposure to covid-19 when distributing fish Shredded

2.3 Data Collection and Processing with FMEA Methods

Data collection using expert judgement is helped by questionnaire instruments. Data analysis uses the Federal Emergency Management Agency (FMEA) method which is a method of evaluating the possibility of a failure of a system, design, process or service to be made handling steps (Yumaida. 2017). In FMEA, any possible failures that occur are quantified to be made a priority for handling.

In this study, FMEA was used to look at the risks that may occur in the company's maintenance operations and operational activities. In this case there are three things that help determine from the disorder, among others
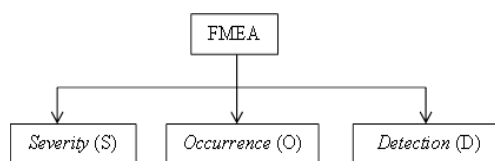
Figure 1. FEMA Parameter Scheme

Severity values reflect the severity of the impact of a potential failure or loss of any risk indicator. Occurence value is the probability of failure or loss of each risk indicator, while the Detection value is the level of availability of a system to detect the impact of a potential failure or loss of each risk indicator to know earlier the failure or loss of each risk indicator.

2.4 Data Processing with AHP Methid

The data processing method used is AHP (Analytical Hierarchy Process). According to Hadianti & Mubarok (2017), AHP is a general theory of measurements used to find ratio scales, both from discrete and continuous paired comparisons.

According to Basuki & Andharini (2016), technically and essentially in the AHP method consists of basic principles in understanding AHP. The basic principle is 1) to arrange a hierarchy, the problem to be solved, described into its elements, namely criteria and alternatives, then arranged into a hierarchical structure; 2) Assessment of criteria and alternatives, criteria and aternatives assessed through paired comparisons. For existing problems a scale of 1 to 9 is the best scale in expressing opinions. Comparisons are made based on the decision-making's policy by assessing the level of importance between one element and another.

The method of processing data with AHP begins by identifying possible strategic alternatives according to the results of the analysis of each risk indicator of each factor. Further formulated a prioritization questionnaire for risk mitigation strategies using the principle of pairwise comparation. The highest value is a consideration of choosing alternative strategies to mitigate each risk indicator (Irawan, et,al., 2017).

3. Result and Discussion

Based on research conducted, the risks faced in micro and small businesses processing fishery products that produce variants of fish Shredded, are in the variables of raw materials, production processes, and demand. These three factors will greatly affect the sustainability of the production process that will be carried out. The FMEA method is used to process identifiers and measure the highest Risk Priority Number (RPN) level in the fish Shredded production process. The results of identifying and measuring risks from FMEA methods can be seen in Table 2.

TABLE 2
THE RESULTS OF IDENTIFYING AND MEASURING RISKS FROM THE FMEA METHOD

Risk Measurement	S	O	D	RPN	Rank
Risk of Raw Materials					
• raw material prices rise					
• reduced supply of raw materials	8	7	7	392	1
• mobility and distribution of raw materials late	7	7	6	294	2
• quality of raw materials decreases	6	5	7	210	3
• exposure to covid-19 due to contact with raw material suppliers	5	4	3	60	4
	3	2	5	30	5
Production Risks					
• fluctuating and uncertain production activities					
• decreased production productivity due to its workforce exposed to covid-19	8	7	7	392	1
• production operating costs increase	6	7	7	294	2
• damage to machinery and equipment in the production process	7	6	6	252	3
• cleanliness and discomfort of the work environment	5	6	4	120	4

Risk Measurement	S	O	D	RPN	Rank
• production failures resulting in product defects	4	5	3	60	5
	4	3	3	36	6
Demand Risk					
• demand for fluctuating fish Shredded and tends to decrease	7	8	8	448	1
• delay in the distribution of fish Shredded	6	7	7	180	2
• the competitors of Shredded fish	5	6	5	150	3
• exposure to covid-19 when distributing fish Shredded	4	5	6	120	4
• cancellation of fish Shredded reservations	3	4	3	36	5
• return on sale of fish Shredded	4	2	2	16	6

Based on the results obtained from Table 2 there are 3 risk variables. The highest RPN risk of procurement of raw materials is in the price of fish raw materials that rose by a value of 392. Price risk on fish raw materials that tend to rise is the highest risk factor, because the raw material used in the production of fish Shredded is tuna which is caught from the sea. Fish raw materials derived from catches from the sea are influenced by the seasons that have an impact on price fluctuations, as stated by Rahim, et.al., (2016) that fluctuations in the price of marine fish commodities are caused by seasonal factors resulting in an imbalance between the demand and supply of fresh sea fish. Febrianti, et., al, (2013) added that the rising price of marine fish raw materials was influenced by the length of the chain of distribution of sales or marketing of marine fish raw materials.

The increase in the price of fish raw materials is caused by the decrease in the availability of raw materials caused by the risk of reduced raw material supply and the risk of mobility and distribution of raw materials late. The reduced supply of marine fish raw materials and slowing mobility and distribution of fish raw materials are due to government policies in preventing and stopping the transmission of covid-19, as stated by Kumala, et.al., (2021), the decrease in the availability of raw materials is suspected due to reduced fishing activities as raw material providers and slowing the flow of raw material distribution due to large-scale social implementation policies and Restrictions on Community Activities.

At the risk of the production process the highest RPN value obtained in the factor of fish Shredded production is fluctuating and uncertain production activities. Fluctuating and uncertain production activities get an RPN value of 252. The fluctuating and uncertain supply of raw materials has an impact on the supply of raw materials which in turn will have an impact on production activities that will also be volatile and uncertain. This was conveyed by Umar (2017), raw material supplies will affect production activities, shortage of raw materials will have an impact on the cessation of production activities, but too large a supply of raw materials can result in too high cost burdens to store and maintain these materials during storage in warehouses. Halim (2018) added, the slowing supply of raw materials will have an impact on slowing production activities and will also impact the disruption of production schedules which in turn are unable to meet the demand for production.

The risk of fluctuating and uncertain production activities is also influenced by the risk of decreased production productivity because the workforce is exposed to covid-19. Based on the results of the interview, some micro and small businesses were forced to stop their production activities because their workforce was exposed to covid-19 and some other micro and small businesses continued their production activities, but by reducing their workforce. Manufacturing production activities such as fish Shredded production are prone to exposure to covid-19 because the production activities are clustered. Karunia (2021) wrote in kompas.com, that Core Indonesia Executive Director Mohammad Faisal mentioned that manufacturing industry players most reduced their workers during the coronavirus pandemic (Covid-19) as a result of government policies that require keeping distance or not crowding to prevent or reduce the transmission of covid-19.

At the risk of demand for the highest RPN value is in the demand factor of fluctuating fish Shredded and tends to decrease with an RPN value of 448. The covid-19 pandemic has an impact on fluctuations and decreased demand for fish Shredded. Fluctuations and decreased demand for fish Shredded in the landmark due to the impact of covid-19 on the economy of the community/consumers, especially declining income. This is as reported in The Warta Ekonomi (2020), the covid-19 pandemic has had an economic impact including people losing their jobs and livelihoods due to being exposed to

work relations, workplaces that are no longer operating, or only closed for a certain time. This condition certainly affects income that continues to decrease.

The second highest rpn value demand risk is the delayed factor in the distribution of fish Shredded which is 180. The slowing of the distribution of fish Shredded is not due to covid-19 but because of government policies related to covid-19, namely in the form of social relations restrictions (socia distancing) in an effort to reduce and break the transmission of covid-19. This was conveyed by Yuliana (2020) that the effect of economic activities in all sectors is not due to the Covid-19 virus as an object, but regulations related to the Covid-19 virus in the form of Restrictions on Community Activities and the implementation of Large-Scale Social Implementation which causes the distribution sector of manufactured products to be slowed and paralyzed because distribution is a work that cannot be done at home.

Uncertain risks should be a priority and should immediately find solutions to at least reduce or minimize the impact that will occur. Based on Table 2 continued with calculations using the AHP method to determine the right strategy in minimizing the risks of the production process. Determining the risk minimization strategy of the production process is required by experts who are experts in this field. The results of strategy selection on the AHP method can be seen in Table 3.

TABLE 3
FISH SHREDDED PRODUCTION RISK MINIMIZATION STRATEGY DUE TO THE IMPACT OF THE COVID-19 PANDEMIC

Purpose	Variable	Risk	Alternative Strategies
production process risk mitigation strategies	raw materials	1. raw material prices rise 2. the supply of raw materials is reduced 3. mobility and distribution of raw materials late 4. quality of raw materials decreases 5. exposed to covid-19 due to contact with raw material suppliers	1. reformat partnerships with raw material suppliers 2. improve raw material planning 3. implement health protocols 4. improve inventory management 5. maintaining the quality of production 6. establish partnerships with resellers such as distributors, agents, retailers and boarding schools 7. do planning and forecasting requests 8. utilizing information technology
	production	1. fluctuating and uncertain production activities 2. decreased production productivity due to its workforce exposed to covid-19 3. production operating costs increase 4. damage to machinery and equipment in the production process 5. cleanliness and discomfort of the work environment 6. production failures resulting in production defects	
	demand	1. demand for fluctuating fish Shredded and tends to decrease 2. delay in distribution of fish Shredded 3. the competitors of Shredded fish 4. exposed to covid-19 while distributing fish Shredded 5. cancellation of fish Shredded reservation	

Purpose	Variable	Risk	Alternative Strategies
		6. eturn on sale of fish Shredded	

The results of calculations with the AHP method are obtained from the value of respondents and the weight of each alternative strategy that can be seen in Table 4

TABLE 4
RESPONDENT CONSISTENCY RATIO

Objective level criteria	Consistency value (CR)
Minimization of production process risks	0,053
Raw materials	0,078
Production process	0,076
Demand	0,086

The results of calculations that have been done in Table 4 show that the CR value for the purpose of minimizing the risk of the production process is 0.048, for the CR value in raw materials of 0.088, in the production process obtained a CR value of 0.084, and the CR value on demand is obtained a value of 0.091. The consistency value obtained in the calculation for each level below or smaller than 0.1. This shows that each level is consistent and can be considered good and does not need to be recalculated. According to Padmowati (2009), it says that if the value of CR = 0.10 (10%) then the degree of consistency is satisfactory, and if the value of CR = 0.10 (10%) then there is an inconsistency when applying the comparison scale of a pair of criteria. In addition to getting the calculation CR value in AHP also produces the weight value of each variable and the structure of the alternative hierarchy of strategies that can be seen in Figure 2.
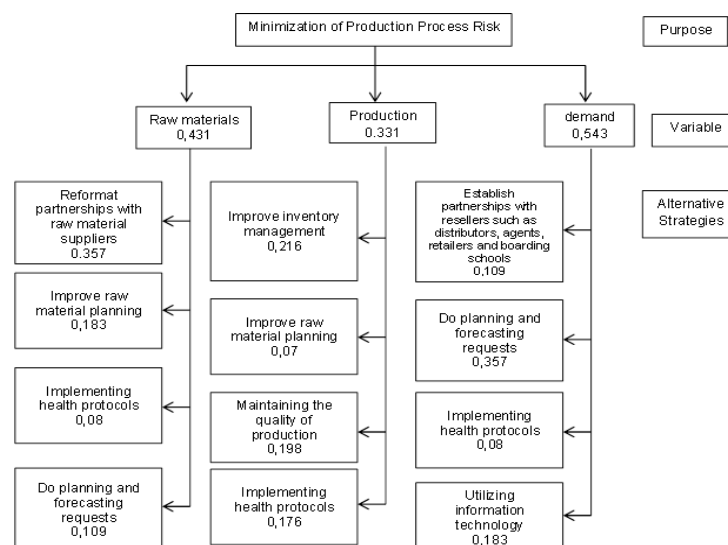

Figure 2. Hierarchical structure of Fish Shredded production risk minimization strategy

Based on the data in Figure 2. The weight value of each strategy is obtained to minimize the risks of the production process. The risks faced in raw material variables, production processes, and demand have different risks, therefore handling is needed in accordance with the risks faced. Such handling can use a good strategy in accordance with the risks faced in raw material variables, production processes, and demand.

3.1 Production Process Strategy

The calculation results in Figure 2. An alternative weighting strategy is obtained in the production process to minimize fluctuating and uncertain production activities. An alternative strategy is to improve inventory management with a weighting value of 0.216.

In this case in the midst of the covid-19 pandemic that has an impact not only on health but also has an impact on micro and small business scale businesses, micro and small businesses that produce

Shredded fish need to improve inventory management with the aim that supplies are not excessive so that over stock and also not reduced so that it cannot meet the demand of Sugiyanto, et., al, (2021) Explaining that micro and small businesses need supplies for the continuity of their business, but what often happens is that inventory management is not managed properly so there are often losses. Therefore, the management of micro and small businesses becomes ineffective and efficient and sometimes high inventory costs appear. The purpose of proper management is to minimize operational costs to a minimum so that it will optimize the company's performance. Therefore, the determination and grouping of costs associated with inventory needs to get special attention from the management in making the right decision.

3.2 Demand Strategy

In the calculation of Figure 2 using the AHP method, an alternative strategy is obtained, namely planning and forecasting demand. This strategy gets a weight value of 0.357. Good planning and forecasting of demand will minimize the risk of fluctuating and tend to decrease demand for fish that has an impact on disruption of production planning, because the results of planning and forecasting demand can be used as a reference for production planning, this was conveyed by Sudiman (2020) that forecasting for a market demand is very important, because as a reference for production planning before orders are received from consumers. USU (2015) added that forecasting results will determine how much market demand results will be obtained by the industry, then from forecasting results can be made production schedule adjusting the market demand that has been known. The results of forecasting and scheduling production show that the industry can produce products in accordance with the amount of market demand that can be done regularly and avoid previous obstacles.

Forecasting also has the benefit of predicting sales precisely over time with regulation, inventory and scheduling. Business people must be able to forecast demand so that by prioritizing the production planning of goods that are adjusted to sales estimates. Basically forecasting is needed when market demand conditions are dynamic and complex (Setyawan, et., al, 2016). The pattern of demand for food products in the midst of the covid-19 pandemic is so dynamic that it is necessary to forecast to know the demand for products. Unilever Chief Executive Officer Alan Jope stated that Covid-19 disease, caused by the coronavirus, has had a tremendous impact on people and economies around the world, where demand patterns have changed (INVESTOR.id, 2020). Companies must be able to do accurate and measurable forecasting because demand in the midst of the covid-19 pandemic is very volatile, where one side of the community experiences a decrease in purchasing power due to declining income and job cuts, on the other hand panic buying. Panic buying and pile up occurred during the covid-19 pandemic, not least in Indonesia. Panic buying and pile up is done for various reasons, which in general is for self-protection from the transmission of the covid-19 virus. People's consumption behavior is changing. These changes include: 1) changes in any products consumed; 2) changes in mindset about taste; 3) changes in the way we shop; 4) override price considerations for health-related products (Khusnul, 2021).

4.   Conclusions

In the process of identifying the process of fish Shredded production in micro and small businesses of fish processing that produces variants of fish Shredded products there are 17 risks, namely on raw material variables, among others, the price of raw materials rises, the supply of raw materials is reduced, the mobility and distribution of raw materials is late, the quality of raw materials decreases and exposure to covid-19 due to contact with raw material suppliers. In the variables of the production process there are risks fluctuating and uncertain production activities, decreased production productivity due to the labor force exposed to covid-19, production operational costs increased, damage to machinery and equipment in the production process, cleanliness and discomfort of the work environment, and production failures resulting in production defects. In the demand variable there is a risk of fluctuating and tends to decrease demand for fish Shredded, delays in the distribution of fish Shredded, fish Shredded competitors, exposure to covid-19 when distributing fish Shredded, cancellation of fish Shredded reservations and return on fish Shredded sales.

The results of measurement and risk assessment of the fish Shredded production process in micro and small fish processing businesses that produce variants of fish Shredded products, obtained the highest risk in each variable. Risks to raw materials (raw material prices rise), risks to production processes (fluctuating and uncertain production activities) and risks to demand (demand for fluctuating and tends to decline)

Priority alternative to reducing raw material risk is to reformat partnerships with raw material suppliers. Priority alternative to reducing risk to the production process is improving inventory management. Priority alternative to reducing demand risk is to plan and forecast demand.

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