

ANALYSIS OF POTENTIAL CONTAMINATION RISKS IN THE BEVERAGE PRODUCTION PROCESS OF TASTEAL OUTLET URIPSUMIHARJO MAKASSAR WITH THE SUPPLY CHAIN OPERATION REFERENCE (SCOR) AND HOUSE OF RISK (HOR) APPROACHES

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Abstrak

The beverage industry in Indonesia continues to experience significant growth every year, with a growth of 3.57 percent in the third quarter of 2022 compared to the same period the previous year. Contemporary beverages, such as bubble tea, iced coffee milk, and milktea, are the main trends in the Indonesia beverage market which are synonymous with innovation and ease of consumption. Amid its popularity, contemporary beverages face new challenges related to the risk of contamination during production, storage, and distribution. This research focuses on the Tasteal outlet in Uripsumiharjo, Makassar, as a case study that represents a common practice in the industry. Tasteal has problems in the form of variations in customer requests that are often complicated can increase the risk of errors in handling ingredients and serving beverages, therefore it is necessary to conduct a contamination risk analysis including evaluation of tasteal outsourcing management, raw materials, sanitation procedures, and the use of serving tools. By applying the Supply Chain Operation Reference (SCOR) and House of Risk (HOR) methods, the research aims to identify and reduce potential contamination risks in the supply chain as well as improve the safety and quality of beverages served to customers. Based on the SCOR model, the analysis includes the process of planning, material receipt, manufacturing, delivery, and return. Key risks include misplanning production, facility unpreparedness, and transportation issues that can disrupt daily stock availability. Meanwhile, from risk identification, 18 potential risks were identified by severity and event assessment. This includes changes in demand, transportation disruptions, lack of sterilization, and problems with beverage ingredients.

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Contamination Risks In The Beverage Production Process Of Tasteal Outlet Uripsumiharjo Makassar With The Supply Chain Operation Reference

INTRODUCTION

Indonesia's beverage industry is one of the strategic sectors, which continues to grow every year. Based on data from the Ministry of Industry, in the third quarter of 2022 there was a growth of 3.57 percent, which is considered to have increased compared to 2021 in the same period of 3.49 percent (kemenperin.go.id, 2022). It is even predicted to grow up to 5 to 6 percent. This growth is in line with the emergence of the contemporary beverage business that is currently popular in Indonesia. Contemporary drinks or trendy drinks occupy the top trending position in the Indonesia beverage market (Jakpat, 2022). Contemporary drinks themselves are synonymous with popular and innovative drinks, with a ready-to-drink concept and offer shared tastes. There are various types of contemporary drinks such as bubble tea or boba, iced coffee milk, milktea, fruit drinks, chocolate drinks, and so on (Tito and Stefani, 2023)

Product quality is the ability of a product to perform its functions which include durability, reliability, precision, convenience, operation and repair and other attributes. If a product can carry out its functions, it can be said to be a product that has good quality according to Kotler & Keller (2001) in the journal (Sulaiman, Udayana and Maharani, 2022).

In the contemporary beverage industry such as the one represented by Tasteal, the make to order concept has become the standard to meet customer personalization demands. At Uripsumiharjo outlets, this includes the use of basic ingredients such as Thai tea, coffee, and green tea that have been produced

beforehand. Although these materials may have passed through the production process in the factory, there is still a potential risk of contamination during storage, transportation, and use at outlets. Uripsumharjo outlet was chosen as the case study for a variety of relevant reasons. First, as part of the well-known Tastea outlet network, these outlets represent common practices used throughout the network, so that the results of the research can be widely applied in an industry context. Second, the location of outlets and significant customer volumes present particular challenges in contamination risk management. Variations in customer requests, which are often complicated, can increase the risk of errors in the handling of ingredients and beverage presentation.

The analysis of the potential risk of contamination at the Urip sumiharjo outlet will include an in-depth evaluation of raw material management, sanitation procedures, and the use of serving utensils. Factors such as environmental conditions in the serving area, compliance with sanitation standards, and staff training in good sanitation practices will be the main focus of the study. Through this research, it is hoped that areas where these practices can be improved can be improved to reduce the risk of contamination and improve the safety and quality of beverages served to customers.

The importance of understanding this potential risk of contamination requires a more structured and comprehensive approach. Therefore, the *Supply Chain Operation Reference (SCOR)* and *House of Risk (HOR)* methods are used to provide a robust framework in analyzing and addressing these issues. The SCOR method helps to map and optimize the overall supply chain, while HOR provides a comprehensive overview of the risks that may arise at each stage of production.

METHOD

Speech and Research Venue

The place of research in this writing was carried out at Tastea Outlet on Jalan Urip Sumoharjo, Panakukang District, Makassar City, South Sulawesi. 90231. The research time is approximately 1 month.

Types and Data Sources

In this study, the author uses quantitative data, namely data in the form of numbers that are calculated and obtained directly from the Tastea Outlet Urip Sumoharjo Branch [namely:

1. Food safety data.
2. Production process data.
3. Data on the ingredients used.
4. Supply chain and supplier compliance data.

Based on the source, the data in this study is divided into two, namely:

1. Primary data, namely data obtained through the observation process at the place where the research took place and also interviews with the owner of Tastea Urip Sumoharjo Branch.
2. Secondary data, namely data obtained from taking supporting data where obtained through previous research journals that have a relationship.

Data Collection Methods

The data collection methods carried out in this study are as follows:

1. Library research

Literature research is research whose data sources are obtained from books such as lecture texts, journals, articles, documents, the internet, and other reference sources taken from previous research.

2. Field research

- a. Observation or Observation directly on the spot with Tastea MSME owners related to the existing beverage production process and direct monitoring of the condition of the research site. It was carried out to get an overview of the situation and conditions that occurred in the beverage production process at the research site.
- b. Interviews are conducted to obtain the necessary information as a preliminary study to find out and arrange the variables that affect so that they can be used to analyze the risk of contamination. Determine and assess *the severity and occurrence* with Tastea MSME owners to be used in identifying *risk events* and *risk agents* to the production process.

Assess the relationship that exists between *risk events* and *risk agents* with Tastea MSME owners.

Data Analysis Methods

The steps in data processing or data analysis in this study are as follows:

1. Mapping production process activities, namely:

- a. Supplier activity
- b. Production activities
- c. Sales activity

2. Risk identification process:

The risk identification process is carried out with the aim of determining *risk events* that have a disturbance impact on each production process activity that has been described previously. In addition, through this process, it is necessary to find out *the risk agent* that is the cause of the *risk event*.

a. Risk Event Identification

A *risk event* is an event or a risk event that has a disruptive impact on the activities of the beverage production process. Through interviews with business owners, *risk events* from each beverage production process activity can be well known, which is noted as E_i with the intention of making it easier to read

b. Identify Risk Agents

Risk agent is a matter or factor that causes a risk event to occur which ultimately has an impact on the activities of the beverage production process that takes place and of the 18 *risk events* that have been identified, the next is to identify the *risk agent* of each of these risks.

3. Risk Assessment Process

Assessment of risks is carried out by conducting interviews with Spv Outlets, baristas, and cashiers. There are 3 assessments, namely *severity risk event*, *occurrence risk agent*, and correlation of *risk event* and *risk agent*.

a. Risk Event Assessment

Risk events will be assessed based on the magnitude of the impact of the disruption caused by the risk (*severity*) on production process activities

b. Risk Agent Assessment

Risk Agent is assessed based on the level of probability of the occurrence of *the risk agent* (*Occurrence*). This assessment is carried out based on *the occurrence value*, which is a scale of 1 – 10

c. Assessment of Risk Event and Risk Agent Correlation Level

The next assessment is to assess the level of correlation between *risk events* and *risk agents* which is an explanation of how likely it is that *risk agents* can cause *risk events* to occur, this correlation value is between 0,1,3,9

d. Calculation with House of Risk Table

Calculation with the house of risk table to calculate the correlation value of risk events with risk agents and the level of *occurrence*.

4. Risk Management

Determine the planning of preventive actions against the risk agent. Tahao entered the house of ripple phase 2 to handle the risk agent that had been selected based on the previous

5. Preventive Assessment

The assessment of preventive measures was carried out by discussing with Spv Outlet Tastea Urip Sumoharjo Branch.

6. Total of Effectiveness (*TEk*) Calculation

After the correlation between preventive measures and risk agents is identified, it is then determined how effective the preventive measures are to reduce the likelihood of risk agents.

7. Difficulty Assessment

- Assess the difficulty level of preventative actions to be taken that can be assessed using a scale of 3-4, and 5 the greater the value the more difficult it is to apply
8. Calculation of *Effectiveness of Difficulty Ratio* (ETDk)
 - ◆ Determine the priority preventive measures to be taken first based on the effectiveness and difficulty level of each preventive measure
 9. Proposed Preventive Measures

All the results of the calculation and assessment of preventive measures are included in the *house of risk phase 2* table as the last step to sort the priority level of each prevention based on the ETDk niali.

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1. RESULTS AND DISCUSSION

The data collection and processing in this study was carried out based on the SCOR and HOR phase 1 methods. The data in this study was obtained through the observation process at the research site directly to obtain an overview of the beverage production process at the research site in addition to obtaining other data such as beverage production process activities, risk identification and others through the direct interview process with Spv Outlets, cashiers, and baristas.

Mapping Production Process Activities

In the research, the first step carried out is to observe the research site directly with the aim of carrying out the process or activity of the beverage production process that occurs at the research site. To suppress every activity of the beverage production process is carried out based on the SCOR model, namely plan, source, make, delivery and return to describe more clearly the supply chain of Tastea Makassar as seen through the following image:

a. Supplier activity

Tastea obtains key ingredients such as tea, fresh fruits, and milk from specialty stores that provide raw materials for tea drinks. They also get additional items such as jelly, boba, and other toppings from suppliers who provide ready-to-use products. For specific ingredients such as boba blends, syrups, and fruit toppings, Tastea relies on specialist distributors who offer a variety of variants to create drinks with unique flavors. With this strategy, Tastea ensures they have access to the high-quality raw materials needed to produce tea drinks that meet the quality and taste standards desired by customers.

b. Production activities

The production process at Tastea is carried out every Monday to Sunday, lasting for 3 hours. The process begins with the making of drinks by from 06.00 to 08.00 am, while the rest is carried out by production employees from 09.00 am to 10.00 pm. Tastea employs employees with expertise in maintaining cleanliness during tea beverage production. They are trained in sanitation, safe selection of raw materials, and comply with food safety regulations. With this commitment, Tastea ensures that their tea beverage products remain of high quality and safe for consumers. Activities in the production process include: Weighing raw materials such as tea, fresh fruits, milk, and other ingredients according to the prescribed recipe. Make a drink mixture by mixing the ingredients until they are evenly distributed and ready for processing. Served by giving ice cubes in a mash and then pressed for further sale.

c. Sales activity

At the Tastea outlet, beverage sales activities are carried out with a focus on customer satisfaction. Every day, employees are ready to serve in a friendly and professional manner, helping customers choose from a variety of drinks available. Customers can easily order through the menu options offered. Tastea employees quickly process orders, prepare drinks with additional ice cubes, boba, or other toppings on request. After that, they serve drinks with appropriate packaging, good. The process of picking up orders at the store or delivering them to the customer's address is seamless, ensuring a satisfying experience every time the customer enjoys a tea drink from Tastea. Mapping production activities or business processes from beverage production is carried out more deeply to find out every activity that runs from raw material suppliers, production houses, to

consumers. The results of the process of identifying the mapping of each production process activity are explained through table 3.1 as follows.

Table 3.1 Plate size and weight data

| Major Processes | | | | Sub Processes |
|--------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Plan | | | | Calculation of beverage ingredients to be brought from the production house to the outlet Production time planning Determine the need for additional raw materials Determine the capacity to be produced in 1 day |
| Source | | | | Receipt of beverage ingredients brought from the production house Conducting inspections of beverage ingredients that have been received |
| Make | | | | Dosing of beverage raw materials |
| No. | Major Processes | Sub Processes | Risk Event | Code |
| 1. | Plan | Calculation of beverage ingredients to be delivered from the production house to the outlet | Quantity calculation error | E1 |
| | | Production time planning | Overproduction | E2 |
| | | | Underproduction | E3 |
| | | Determine the need for additional beverage ingredients | Availability | E4 |
| Determine the capacity to be produced in one day | Operational Disruption | E5 | | |
| 2. | Source | Receipt of beverage ingredients delivered from the production house to the outlet | Delay in delivery | E6 |
| | | Conducting inspections of beverage ingredients that have been delivered | Selma contaminated beverage ingredients delivery to outlets | E7 |
| | | | Damage during storage | E8 |
| | | | Quality changes | E9 |
| | | Admission errors | E10 | |

| | | | | |
|---------|--------|---------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------|
| | | | Cross-contamination with other beverage ingredients | E11 |
| | | Dosage of beverage ingredients added | Metering errors | E12 |
| 3. | Make | The process of mixing ingredients – additional beverage ingredients | Out of stock | E13 |
| | | | Making drinks that are not according to the prescribed recipe | E14 |
| | | | Cross-contamination between baristas and drinks | E15 |
| | | | Checking the beverage production equipment used | Errors in tool maintenance |
| | | Beverage packaging | Less sterile packaging containers | E17 |
| | | 4. | Deliver | Serving drinks to consumers |
| 5. | Return | - | - | |
| Deliver | | | | Serving drinks to consumers |
| Retrun | | | | - |

Source: 2024 Interview Data

Plan is a process of maintaining the balance between *demand* and *supply* so that it can meet the needs of producers so that when procuring raw materials, production and sales to consumers can be carried out in the right way. *Source* is all barang procurement activities that are carried out to meet demand needs. *Make* is the process of changing raw materials that are initially raw into products that are ready to be used or consumed. *Deliver* is the activity of distributing or facilitating products that consumers want in an effort to meet the needs of consumer demand. *Retrun* is an activity of returning goods caused by several underlying alasams.

Risk Identification Process

The risk identification process is carried out with the aim of determining risk events that have a disturbance impact on each production process activity that has been described previously. In addition, through this process, it is necessary to find out the risk agent that is the cause of the risk event. This risk identification process is based on the House of Risk phase 1 method and is carried out through interviews and discussions directly with Spv Outlet and Taste Outlet Barista Urip Sumiharjo Makassar.

a. Identify Risk events

A risk event is an event or a risk event that has a disruptive impact on the activities of the beverage production process. Through interviews with business owners, risk events from each beverage production process activity can be well known, which is noted as E_i with the intention of making it easier to read. For more details, the risk events of the beverage production process at the Urip Sumiharjo Taste Outlet are described in table 3.2 as follows.

After *the risk events* have been identified as described in table 4.2 above, in general, there are a total of 18 *risk events* spread across each activity of the beverage production process. Of the 18 *risk events*, in the next process, risks that have a relationship with the sterility of beverages that may have the potential to cause contamination to cleanliness will be identified after the process of identifying *risk agents* and risk rese: s.

b. Identify Risk Agents

Risk agent is a matter or factor that causes a risk event to occur which ultimately has an impact on the activities of the beverage production process that takes place and of the 18 risk events that have been identified, the next is to identify the risk agent of each of these risks. For example, when identifying risk events to identify risk agents, interviews are conducted with business owners

directly and risk agents are notated as A_i to make it easier to read. The results of the identification can be seen through table 3.3 as follows.

Table 3.2 Identification of *Risk Agents*

| <i>Risk Agent</i> | <i>Code (A_i)</i> |
|----------------------------------------------------------------------|-----------------------------|
| Failing to set production targets | A1 |
| Changes in beverage trends | A2 |
| Change in demand | A3 |
| Setting production capacity that is too large for demand | A4 |
| Making predetermined beverage ingredients is not enough daily demand | A5 |
| Cracking down on beverage production equipment | A6 |
| Disruptions in the transport system | A7 |
| Weather changes | A8 |
| Less sterile beverage storage containers | A9 |
| Temperature and humidity changes | A10 |
| Chemical Reactions between Beverage Ingredients | A11 |
| Unsuitable transport conditions | A12 |
| No labels on the storage container for the outlet to be delivered | A13 |
| Storage container leakage | A14 |
| Improper storage | A15 |
| Limitations of separation | A16 |
| There is no SOP in the production process at the outlet | A17 |
| Mismixing of beverage ingredients | A18 |
| Absence of SOP for maintenance of production equipment | A19 |
| Excessive use | A20 |
| Lack of sterilization process | A21 |
| Not using appropriate protective gear when making drinks | A22 |
| Almost similar customer names | A23 |
| Same order menu | A24 |

Source: 2024 Interview Data

Risk Assessment Process

The data that has been collected is as described previously so that the risk events and risk agents of the beverage production process activities are known. Next is to assess the risks carried out by conducting interviews with Spv Outlets, baristas, and cashiers. There are 3 assessments, namely severity risk event, occurrence risk agent, and correlation of risk event and risk agent.

a. Risk Event *Assessment*

Risk events will be assessed based on the magnitude of the impact of the disruption caused by the risk (*severity*) to the activities of the production process. This assessment is carried out by giving a value to the risk *Event* Based on the severity value with a scale of 1 – 10 explained in Table 4.5 and the Risk Event assessment can be seen in Table 4.4 as follows.

Table 3.4 Severity Scale

| Severity Rating | Information |
|-----------------|---------------------------|
| 1 | None |
| 2 | The impact is very small |
| 3 | The impact is slight |
| 4 | The impact is small |
| 5 | The impact is moderate |
| 6 | The impact is big |
| 7 | The impact is huge |
| 8 | The impact is very severe |

| | |
|----|-------------------------|
| 9 | The impact is serious |
| 10 | The impact is dangerous |

Sumber: (Prasetyo et al, 2022)

Table 3.5 Severity Value Scale

| Risk Event | Code | Severity |
|---------------------------------------------------------------|------|----------|
| Quantity calculation error | E1 | 5 |
| Overproduction | E2 | 5 |
| Underproduction | E3 | 7 |
| Availability | E4 | 7 |
| Operational Disruption | E5 | 5 |
| Delay in delivery | E6 | 6 |
| Selma contaminated beverage ingredients delivery to outlets | E7 | 7 |
| Damage during storage | E8 | 8 |
| Quality changes | E9 | 8 |
| Admission errors | E10 | 5 |
| Cross-contamination with other beverage ingredients | E11 | 7 |
| Metering errors | E12 | 7 |
| Out of stock | E13 | 5 |
| Making drinks that are not according to the prescribed recipe | E14 | 8 |
| Cross-contamination between baristas and drinks | E15 | 5 |
| Errors in tool maintenance | E16 | 9 |
| Less sterile packaging containers | E17 | 9 |
| Incorrect order serving | E18 | 4 |

Source: 2024 Interview Data

b. Risk Agent Assessment

Risk Agent is assessed based on the level of probability of the occurrence of the risk agent (Occurrence). This assessment is carried out based on the occurrence value, namely a scale of 1 – 10 which is described in table 3.6 and the results of the assessment of the risk agent can be seen from table 3.7 as follows.

Table 3.6 Severity Value Scale

| Nilai Occurrence | Information |
|------------------|----------------------------------------------------------------|
| 1 | Almost never happens |
| 2 | The occurrence of very very few risk causes |
| 3 | The occurrence of very few risk causes |
| 4 | The appearance of risk causes is slight |
| 5 | Occurrence of low-risk causes |
| 6 | Occurrence of moderate risk causes |
| 7 | The occurrence of risk causes is quite high |
| 8 | Emergence of high-risk causes |
| 9 | The occurrence of very high risk causes |
| 10 | The occurrence of the cause of risk is almost always occurring |

Sumber: (Prasetyo et al, 2022)

Table 3.7 Risk Agent Assessment

| Risk Agent | Code | Occurrence |
|----------------------------------------------------------------------|------|------------|
| Failing to set production targets | A1 | 3 |
| Changes in beverage trends | A2 | 2 |
| Change in demand | A3 | 6 |
| Setting production capacity that is too large for demand | A4 | 7 |
| Making predetermined beverage ingredients is not enough daily demand | A5 | 7 |
| Cracking down on beverage production equipment | A6 | 5 |

| <i>Risk Agent</i> | <i>Code</i> | <i>Occurence</i> |
|-------------------------------------------------------------------|-------------|------------------|
| Disruptions in the transport system | A7 | 6 |
| Weather changes | A8 | 5 |
| Less sterile beverage storage containers | A9 | 5 |
| Temperature and humidity changes | A10 | 7 |
| Chemical Reactions between Beverage Ingredients | A11 | 6 |
| Unsuitable transport conditions | A12 | 7 |
| No labels on the storage container for the outlet to be delivered | A13 | 9 |
| Storage container leakage | A14 | 8 |
| Improper storage | A15 | 8 |
| Limitations of separation | A16 | 6 |
| There is no SOP in the production process at the outlet | A17 | 6 |
| Increased demand | A18 | 5 |
| Mismixing of beverage ingredients | A19 | 4 |
| Absence of SOP for maintenance of production equipment | A20 | 4 |
| Excessive use | A21 | 7 |
| Lack of sterilization process | A22 | 9 |
| Not using appropriate protective gear when making drinks | A23 | 10 |
| Almost similar customer names | A24 | 3 |
| Same order menu | A25 | 3 |

Source: 2024 Interview Data

c. Assessment of *Risk Event* and *Risk Agent* Correlation Level

The next assessment is to assess the level of correlation between risk events and risk agents which is an explanation of how likely it is that risk agents can cause risk events to occur, the correlation value is between 0,1,3,9 which can be explained in table 3.8 and the correlation assessment can be seen in table 3.9 as follows.

Table 3.8 Correlation Value Scale

| Tilapia Correlation | Information |
|----------------------------|-------------------------------------|
| 0 | No correlation |
| 1 | Correlation/weak relationship |
| 3 | Correlation / moderate relationship |
| 9 | Correlation / strong relationship |

Sumber: (Prasetyo et al, 2022)

Table 3.8 Correlation assessment of *Risk Events* and *Risk Agents*

| <i>Risk Event</i> | <i>Code</i> | <i>Risk Agent</i> | <i>Code</i> | <i>Correlation</i> |
|----------------------------|-------------|----------------------------------------------------------------------|-------------|--------------------|
| Quantity calculation error | E1 | Failure to set production targets | A1 | 1 |
| Demand ups and downs | E2 | Changes in beverage trends | A2 | 3 |
| Overproduction | E3 | Changes in beverage trends | A3 | 3 |
| | | Request changes | A4 | 9 |
| Underproduction | E4 | Making predetermined beverage ingredients is not enough daily demand | A5 | 9 |

| Risk Event | Code | Risk Agent | Code | Correlation |
|---------------------------------------------------------------|-------------|-----------------------------------------------------------------------------|-------------|--------------------|
| Operational Disruption | E5 | Damage to production equipment | A6 | 3 |
| Delay in Delivery | E6 | Disruptions in the transport system | A7 | 9 |
| | | Weather changes | A8 | 3 |
| Selma contaminated beverage ingredients delivery to outlets | E7 | Quality changes | A9 | 9 |
| | | Temperature and humidity changes | A10 | 3 |
| Damage during storage | E8 | Chemical Reactions between Beverage Ingredients | A11 | 3 |
| | | Unsuitable transport conditions | A12 | 9 |
| Quality changes | E9 | Orders that come in large numbers at almost the same time | A11 | 9 |
| Admission errors | E10 | There are no labels on the storage container for the outlet to be delivered | A13 | 9 |
| Cross-contamination with other beverage ingredients | E11 | Occurrence of Leakage of Beverage Storage Container | A14 | 9 |
| | | Improper storage | A15 | 3 |
| | | Limitations of separation of storage of beverage ingredients | A16 | 9 |
| Metering errors | E12 | There is no SOP in the production process at the outlet | A17 | 9 |
| Out of stock | E13 | Increase in daily demand | A18 | 9 |
| Making drinks that are not according to the prescribed recipe | E14 | Mismixing of beverage ingredients | A19 | 9 |
| Errors in tool maintenance | E15 | Absence of SOP for use maintenance | A20 | 3 |
| | | Excessive use | A21 | 3 |
| Less sterile packaging containers | E16 | Kurangnya prosuder Sterlisai | A22 | 9 |
| Cross-contamination between baristas and drinks | E17 | Not using appropriate utensils when making drinks | A23 | 9 |
| Incorrect order serving | E18 | Almost similar customer names | A24 | 1 |
| | | Same order menu | A25 | 3 |

Source: 2024 Interview Data

The following is the final result of the analysis on *the house of risk phase 1* in full which can be seen in table 4.15 below.

Tabel 4.14 House of Risk Fase1

| BUSINESS PROCESSES | RISK EVENT | RISK AGENT | | | | | | | | | | | | | | | | | | | | SEVERITY | |
|------------------------|------------|------------|----|----|----|----|----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|-----|
| | | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | A12 | A13 | A14 | A15 | A16 | A17 | A18 | A19 | A20 | | A21 |
| PLAN | E1 | 3 | | | | | | | | | | | | | | | | | | | | | 2 |
| | E2 | | 1 | 1 | | | | | | | | | | | | | | | | | | | 9 |
| SOURCE | E3 | | | | 3 | | | | | | | | | | | | | | | | | | 5 |
| | E4 | | | | | 3 | | | | | | | | | | | | | | | | | 4 |
| | E5 | | | | | | 3 | | | | | | | | | | | | | | | | 6 |
| | E6 | | | | | | | 3 | | | | | | | | | | | | | | | 4 |
| | E7 | | | | | | | | 3 | | | | | | | | | | | | | | 7 |
| | E8 | | | | | | | | | 9 | | | | | | | | | | | | | 5 |
| | E9 | | | | | | | | | | 9 | | | | | | | | | | | | 5 |
| | E10 | | | | | | | | | | | 3 | | | | | | | | | | | 8 |
| | E11 | | | | | | | | | | | | 9 | | | | | | | | | | 4 |
| | MAKE | E12 | | | | | | | | | | | | 9 | | | | | | | | | |
| E13 | | | | | | | | | | | | | | 9 | | | | | | | | | 9 |
| E14 | | | | | | | | | | | | | | | 3 | | | | | | | | 6 |
| E15 | | | | | | | | | | | | | | | | 9 | | | | | | | 9 |
| E16 | | | | | | | | | | | | | | | | | 9 | | | | | | 9 |
| DELIVERY RETURN | E17 | | | | | | | | | | | | | | | | | | 3 | | | | 5 |
| | | | | | | | | | | | | | | | | | | | | | 3 | | 3 |
| OCCURRENCE | | 5 | 2 | 2 | 1 | 7 | 3 | 3 | 3 | 5 | 5 | 7 | 4 | 7 | 8 | 7 | 5 | 4 | 3 | 7 | 3 | 6 | |
| AGREGAT RISK POTENTIAL | | 30 | 18 | 9 | 15 | 84 | 54 | 108 | 63 | 225 | 75 | 504 | 144 | 486 | 648 | 126 | 405 | 324 | 81 | 567 | 45 | 90 | |
| PERINGKAT | | 18 | 19 | 21 | 20 | 12 | 16 | 10 | 15 | 7 | 13 | 3 | 8 | 4 | 1 | 9 | 5 | 6 | 14 | 2 | 17 | 11 | |

Based on the ARP values that have been derived from the calculation of the table above, then determine the dominant agent risk by using the pareto approach using the pareto diagram to determine the dominant source of risk. According to Caesaron & Tandianto, (2014) the pareto diagram is made using the cumulative percentage of each ARP of the *Risk agent*. Figure 3.1 below shows a chart of Risk agent pareto

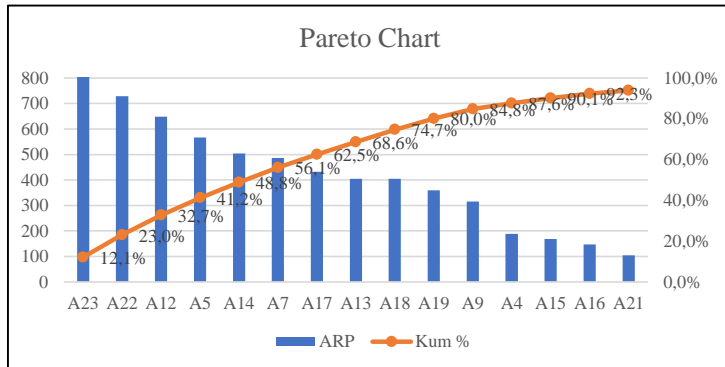


Figure 4.1 Pareto Risk Agent Diagram

Table 4.15 Cumulative Percentage of Pareto Results

| Risk Agent | ARP | Percentage | Sand % |
|------------|-----|------------|--------|
| A23 | 810 | 12,13% | 12,1% |
| A22 | 729 | 10,91% | 23,0% |
| A12 | 648 | 9,70% | 32,7% |
| A5 | 567 | 8,49% | 41,2% |
| A14 | 504 | 7,55% | 48,8% |
| A7 | 486 | 7,28% | 56,1% |
| A17 | 432 | 6,47% | 62,5% |
| A13 | 405 | 6,06% | 68,6% |
| A18 | 405 | 6,06% | 74,7% |
| A19 | 360 | 5,39% | 80,0% |
| A9 | 315 | 4,72% | 84,8% |
| A4 | 189 | 2,83% | 87,6% |
| A15 | 168 | 2,52% | 90,1% |
| A16 | 147 | 2,20% | 92,3% |
| A21 | 105 | 1,57% | 93,9% |
| A11 | 72 | 1,08% | 95,0% |
| A10 | 63 | 0,94% | 95,9% |
| A20 | 60 | 0,90% | 96,8% |
| A8 | 54 | 0,81% | 97,6% |
| A6 | 45 | 0,67% | 98,3% |
| A24 | 36 | 0,54% | 98,8% |
| A2 | 30 | 0,45% | 99,3% |
| A3 | 21 | 0,31% | 99,6% |

| Risk Agent | ARP | Percentage | Sand % |
|------------|------|------------|--------|
| A1 | 15 | 0,22% | 99,8% |
| A25 | 13 | 0,19% | 100,0% |
| | 6679 | 100,00 % | |

Source: Data Processing 2024

Based on the principle of the 80/20 pareto diagram, as many as 80.0% of risk agents were taken to plan a handling strategy that was expected to affect the improvement of the other 20.0% of risk agents. There are 10 dominant risk agents out of a total of 25 risk agents in the beverage production process activities at the tastea Uripsumiharjo outlet in Makassar City. The following table 4.16 is a list of dominant risk agents along with the severity and occurrence factors used to map the risk:

Table 4.15 Dominant Risk Agent Before Handling

| No | Code | Risk Agent | Severity | Occurrence |
|----|------|-------------------------------------------------------------------------------------------------------------|----------|------------|
| 1 | A23 | Not using appropriate protective gear when making drinks | 9 | 10 |
| 2 | A22 | Lack of sterilization procedures | 9 | 9 |
| 3 | A12 | Unsuitable Transportation Conditions | 8 | 7 |
| 4 | A5 | Making the beverage that has been produced is not enough for the daily demand | 7 | 7 |
| 5 | A14 | Leakage in beverage storage containers | 6 | 8 |
| 6 | A7 | Transportation system disruption | 6 | 5 |
| 7 | A17 | There is no SOP in the production process at the outlet | 8 | 6 |
| 8 | A13 | Absence of labels on storage containers for outlets to be delivered from the production house to the outlet | 5 | 9 |
| 9 | A18 | Daily Increase in Demand | 6 | 7 |
| 10 | A19 | Incorrect mixing of additional beverage ingredients | 8 | 6 |

Source: Data Processing 2024

The risk value of the risk agent not using appropriate protective equipment when making drinks is 90, the risk agent lacks the strelation process of 81, the risk agent of inappropriate transportation conditions is 56, the risk agent makes the beverage ingredients that have been produced insufficient daily demand is 49, the risk agent of leakage in the storage container of beverage ingredients is 48, risk agent Transportation system disruption is 30, risk agent There is no SOP in the production process at the outlet 48, risk agent There is no label on the storage container for the outlet to be delivered from the production house to the outlet is 45, the risk agent Increase in daily demand is 42, and the risk agent Mismixing additional beverage ingredients is 48. After knowing the dominant source of risk, then make a risk map. The risk map is useful for viewing risk conditions before the adjournment is granted. Figure 3.2 shows the position of the dominant risk agent before the suspension:

| | | | | | | |
|-------------|-----------|----------|-----|----------|----------|-----------|
| Probability | Very Tall | | A13 | | | A23, A22 |
| | Tall | | | A14, A18 | A12, A5 | |
| | Keep | | | | A17, A19 | |
| | Low | | | A7 | | |
| | Very Low | | | | | |
| | | Very Low | Low | Keep | Tall | Very tall |

Impact

Figure 3.2 Risk map before prioritizing confectionery strategy Information:

Green = Light risk position
Yellow = Medium risk position
Red = Critical risk position

From mapping the source of risk into the risk map, it can be seen that there are 8 *risk agents* in the red area which means that the risk is in the highest or critical position so that this risk must be quickly mitigated as soon as possible. And 4 *risk agents* are in the yellow area which means the risk of a medium position so it needs to be managed regularly and effective control and strategies must be implemented. Judging from the existing risk conditions, it is necessary to design a handling strategy so that there is no disruption to the beverage production process activities at the Uripsumahrjo tastea outlet in Makassar City.

Risk Management

House of risk phase 1 ends with the *risk agent with the intention of ARP*, then continues by determining the planning of the risk agent's deterrence action . This tahao enters the *house of ripple phase 2* to handle the *risk agent* that has been selected based on the previous one which can be seen in table 3.14. After determining the *risk agent* to be given prevention, the next step is to identify relevant preventive measures. For this reason, a proposal for preventive measures based on 8 *risk agents* will be handled as follows.

Table 3.2 Risk Precautions

| No. | Preventive Action (Pak) | Code |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1 | Ensure baristas wear protective gear while working by conducting regular inspections or supervision by outlet supervisors | PA1 |
| 2 | Regular cleaning of transportation cars, delivery of beverage materials | PA2 |
| 3 | Perform regular checks and verifications to ensure sterilization procedures are followed correctly and effectively | PA3 |
| 4 | Create accurate production planning | PA4 |
| 5 | Proper use of containers | PA5 |
| 6 | Alternative route planning | PA6 |
| 7 | The creation of a detailed and clear SOP for the process of mixing beverage ingredients, including the right steps in measuring and mixing ingredients | PA7 |
| 8 | Use of standard, clear labels | PA8 |
| 9 | Improved demand forecasting process | PA9 |
| 10 | Employee training and certification | PA10 |

Source: Data Processing 2024

Preventive Assessment

The assessment of preventive measures was carried out by discussing with Spv Outlet Tastea. First, assess the relationship between risk prevention measures and risk agents using the same correlation scale in the house of risk phase 1, namely in table 4.9 and the level of this relationship is symbolized by the Ejk code which shows the level of effectiveness of preventive measures against the decrease in the likelihood of risk agents. For more details, please see table 3.18.

Table 3.18 Assessment of Correlation of Preventive Measures with Risk Agents

| Risk Agent | Preventive Action | | | | | | | | | |
|------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | PA1 | PA2 | PA3 | PA4 | PA5 | PA6 | PA7 | PA8 | PA9 | PA10 |
| A23 | 9 | | | | | | | | | |

| | | | | | | | | | | | |
|-----|--|---|---|---|---|---|---|---|---|---|--|
| A22 | | 3 | | | | | | | | | |
| A12 | | | 9 | | | | | | | | |
| A5 | | | | 3 | | | | | | | |
| A14 | | | | | 9 | | | | | | |
| A7 | | | | | | 1 | | | | | |
| A17 | | | | | | | 9 | | | | |
| A13 | | | | | | | | 9 | | | |
| A18 | | | | | | | | | 3 | | |
| A19 | | | | | | | | | | 1 | |

Source: 2024 Interview Data

Total of Effectiveness (TEk) Calculation

After the correlation between preventive measures and risk agents is identified, it is then determined how effective the preventive measures are to reduce the possibility of risk agents by using the following formula.

$$TEk = \sum_j ARP_j E_{jk} \dots\dots\dots (2)$$

With:

- TEk = Total of Effectiveness
- ARP = Agregate Risk Potential
- E_{jk} = Correclation Value

Table 3.19 Perhitungan Total of Effectiveness

| Risk Agent | Preventive Action | | | | | | | | | | ARP |
|------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|
| | PA1 | PA2 | PA3 | PA4 | PA5 | PA6 | PA7 | PA8 | PA9 | PA10 | |
| A23 | 9 | | | | | | | | | | 810 |
| A22 | | 3 | | | | | | | | | 729 |
| A12 | | | 9 | | | | | | | | 648 |
| A5 | | | | 3 | | | | | | | 567 |
| A14 | | | | | 9 | | | | | | 504 |
| A7 | | | | | | 1 | | | | | 486 |
| A17 | | | | | | | 9 | | | | 432 |
| A13 | | | | | | | | 9 | | | 405 |
| A18 | | | | | | | | | 3 | | 405 |
| A19 | | | | | | | | | | 1 | 360 |
| Single | | | | | | | | | | | |

Difficulty Assessment

Assessing the difficulty level of preventive measures to be taken that can be assessed using a scale of 3,4, and 5, the larger the value, the more difficult it is to apply And for the assessment of the difficulty level of preventive measures, it can be seen in the following table.

Table 3.20 Difficulty Assessment

| Code | Preventive Action (Pak) | Diffictulty (Dk) |
|------|---------------------------------------------------------------------------------------------------------------------------|------------------|
| PA1 | Ensure baristas wear protective gear while working by conducting regular inspections or supervision by outlet supervisors | 5 |
| PA2 | Regular cleaning of transportation cars, delivery of beverage materials | 3 |

| Code | Preventive Action (Pak) | Diffictulty (Dk) |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| PA3 | Perform regular checks and verifications to ensure sterilization procedures are followed correctly and effectively | 5 |
| PA4 | Create accurate production planning | 3 |
| PA5 | Proper use of containers | 3 |
| PA6 | Alternative route planning | 3 |
| PA7 | The creation of a detailed and clear SOP for the process of mixing beverage ingredients, including the right steps in measuring and mixing ingredients | 5 |
| PA8 | Use of standard, clear labels | 4 |
| PA9 | Improved demand forecasting process | 3 |
| PA10 | Employee training and certification | 3 |

Perhitungan *Effectivness of Diffculty* (ETDk)

Calculating the value of the Effectivness of Diffculty Ratio (ETDk) to determine the preventive measures that are the priority to be taken first seen from the effectiveness and difficulty level where each action will be sorted based on the highest ETDk value to the lowest value. And to calculate ETDk tilapia you can use the following formula

$$ETDk = TEk / Min \dots\dots\dots (3)$$

With:

ETDk = *Effectiveness of diffictulty ratio*

TEK = *Total effectiveness of action*

Dk = *Degree of difficulty*

Table 3. 21 Calculation of the *effectivness of diffictulty ratio* (ETDk)

| Preventi Action (Pak) | Total effectiveness of action (TEk) | Diffictulty (Dk) | ETDk |
|-------------------------|--------------------------------------|--------------------|------|
| PA1 | 7290 | 5 | 1458 |
| PA2 | 2187 | 3 | 729 |
| PA3 | 5832 | 5 | 1166 |
| PA4 | 1701 | 3 | 567 |
| PA5 | 4536 | 3 | 1512 |
| PA6 | 486 | 3 | 162 |
| PA7 | 3645 | 5 | 729 |
| PA8 | 3645 | 4 | 911 |
| PA9 | 1080 | 3 | 360 |
| PA10 | 315 | 3 | 105 |

Proposed prevention measures

All the results of the calculation and assessment of preventive measures are included in the house of risk phase 2 table as the last step to sort the priority level of each prevention based on the ETDk niali. For the house of risk phase 2 table, please see table 3.22

Tabel 3.22 House of Risk fase 2

| Risk Agent | Preventive Action | | | | | | | | | | ARP |
|-------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|------|-----|------|------|------|------|-----|
| | PA1 | PA2 | PA3 | PA4 | PA5 | PA6 | PA7 | PA8 | PA9 | PA10 | |
| Not using appropriate protective gear when making drinks | 9 | | | | | | | | | | 810 |
| Lack of sterilization procedures | | 3 | | | | | | | | | 729 |
| Unsuitable Transportation Conditions | | | 9 | | | | | | | | 648 |
| Making the beverage that has been produced is not enough for the daily demand | | | | 3 | | | | | | | 567 |
| Leakage in beverage storage containers | | | | | 9 | | | | | | 504 |
| Transportation system disruption | | | | | | 1 | | | | | 486 |
| There is no SOP in the production process at the outlet | | | | | | | 9 | | | | 405 |
| Absence of labels on storage containers for outlets to be delivered from the production house to the outlet | | | | | | | | 9 | | | 405 |
| Daily Increase in Demand | | | | | | | | | 3 | | 360 |
| Incorrect mixing of additional beverage ingredients | | | | | | | | | | 1 | 315 |
| Total Effectiveness of Action (TEk) | 7290 | 2187 | 5832 | 1701 | 4536 | 486 | 3645 | 3645 | 1080 | 315 | |
| Degree of Difficulty (Dk) | 5 | 3 | 5 | 3 | 3 | 3 | 5 | 4 | 3 | 3 | |
| Effectiveness to Difficulty Ratio (ETD) | 1458 | 729 | 1166 | 567 | 1512 | 162 | 729 | 911 | 360 | 105 | |
| Rank | 1 | 6 | 3 | 7 | 2 | 9 | 5 | 4 | 8 | 10 | |

Information:

Ai = Risk Agent selected to be held

Pi = Preventive action or treatment strategy to be carried out

ARPj = Aggregate Risk Priority of the Risk Agent

TEk = Total effectiveness of each handling action

Dk = Difficulty in handling

ETD = Effectiveness difficulty performing action

Rank = Rank of each handling action based on the order of highest ETD value
Based on the HOR phase 2 calculation, the order of priority of handling is obtained as shown in table 3.22

Table 3.22 Priority Order of Prevention Handling

| Code | Preventive Action (PAK) | Peringkat |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| PA1 | Ensure baristas wear protective gear while working by conducting regular inspections or supervision by outlet supervisors | 1 |
| PA5 | Proper use of containers | 2 |
| PA3 | Perform regular checks and verifications to ensure sterilization procedures are followed correctly and effectively | 3 |
| PA8 | Use of standard, clear labels | 4 |
| PA7 | The creation of a detailed and clear SOP for the process of mixing beverage ingredients, including the right steps in measuring and mixing ingredients | 5 |
| PA2 | Regular cleaning of transportation cars, delivery of beverage materials | 6 |
| PA4 | Create accurate production planning | 7 |
| PA9 | Improved demand forecasting process | 8 |
| PA6 | Alternative route planning | 9 |
| PA10 | Employee training and certification | 10 |

After assessing the effectiveness value of the handling strategy, a severity and occurrence assessment is carried out again to assess the condition of the risk agent after the priority design of the handling strategy is made. This assessment is based on the opinions of experts by forming a focus group discussion. Table 3.23 follows the assessment of severity and occurrence risk agent after treatment

Table 2.23 Dominant Risks After Designing Strategic Handling Priorities

| No. | Code | Risk Agent | Severity | Occurrence |
|-----|------|-------------------------------------------------------------------------------------------------------------|----------|------------|
| 1 | A23 | Not using appropriate protective gear when making drinks | 7 | 5 |
| 2 | A22 | Lack of sterilization procedures | 8 | 6 |
| 3 | A12 | Unsuitable Transportation Conditions | 4 | 7 |
| 4 | A5 | Making the beverage that has been produced is not enough for the daily demand | 3 | 8 |
| 5 | A14 | Leakage in beverage storage containers | 6 | 6 |
| 6 | A7 | Transportation system disruption | 3 | 5 |
| 7 | A17 | There is no SOP in the production process at the outlet | 5 | 5 |
| 8 | A13 | Absence of labels on storage containers for outlets to be delivered from the production house to the outlet | 7 | 3 |
| 9 | A18 | Daily Increase in Demand | 4 | 4 |
| 10 | A19 | Incorrect mixing of additional beverage ingredients | 3 | 3 |

The occurrence of a decrease in the value of risk after there is a strategy for designing a handling, namely the risk agent does not use appropriate protective equipment when making drinks, the initial risk value is 90 and then decreases to 35, the risk agent lacks a sterilization procedure, the initial risk

value is 81 and then decreases to 48, the risk agent of transportation conditions that are not in accordance with the initial risk of 56 decreases to 28, Risk Agent makes the beverage ingredients that have been produced insufficient daily demand Initial risk value 49 decreases to 24, Risk Agent Leaks occur in beverage storage containers Initial risk value 48 decreases to 36, Risk Agent Transportation system disruption Initial risk value 30 decreases to 15, Risk agent does not have SOP in the production process at outlets Initial value 48 decreases to 25, Risk Agent Absence of a label on the storage container for the outlet to be delivered from the production house to the outlet Initial risk value of 45 decreased to 21, Risk Agent increased Daily demand Initial risk value of 25 decreased to 16, Risk Agent incorrectly mixed additional beverage ingredients Initial risk value of 20 decreased to 9. After the management strategy is in the green area, it means that the risk is light. This shows that there is a change in a more positive direction for each risk agent after there is a mitigation strategy.

| | | | | | | |
|-------------|-----------|------------|------|----------|-----------|--|
| Probability | Very Tall | | | | | |
| | Tall | A13 | | A23, A22 | | |
| | Keep | | | A14, | | |
| | Low | | | | | |
| | Very Low | A7,A18,A19 | | | A12,A5 | |
| | Very Low | Low | Keep | Tall | Very tall | |
| | Impact | | | | | |

CONCLUSIONS AND SUGGESTIONS

Conclusion

A study of the Tastea Uripsumiharjo outlet in Makassar City identified risks in the production and delivery of beverages. The analysis using the SCOR model includes the process of planning, material receiving, manufacturing, shipping, and returning. Key risks include production planning errors, facility unpreparedness, and transportation issues that can disrupt stock availability. Mitigation strategies based on the House of Risk (HOR) phases 1 and 2, such as the use of protective equipment and more accurate production planning, are expected to improve operational efficiency and minimize risks.

Advice

Suggestions for this study:

1. Tastea can implement the proposed prevention plan suggested by the researcher or redesign the proposed reference.
2. For further research, it is recommended to identify and analyze risks more deeply by involving several MSMEs at once. The identification and analysis methods that can be used include AHP and ANP to measure the performance of the production process and the Fuzzy Delphi and Dematel methods for more detailed analysis with broader criteria.

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