MINIMIZING DEFECTS IN WHITE COPRA COCONUT PRODUCTS USING SIX SIGMA AND FUZZY FMEA METHODS (CASE STUDY: CV. AMARTA INDRAGIRI HILIR)

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Diajukan sebagai Salah Satu Syarat
untuk Memperoleh Gelar Sarjana Teknik
pada Program Studi Teknik Industri

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PEKANBARU
2024

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بسم الله الرحمن الرحيم

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MINIMIZING DEFECTS IN WHITE COPRA COCONUT PRODUCTS USING SIX SIGMA AND FUZZY FMEA METHODS (CASE STUDY: CV. AMARTA INDRAGIRI HILIR)

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ARTICLE INFORMATION

INTRODUCTION

Coconut or in other languages Cocos nucifera is a plant native to the tropics that is found in Indonesia. Based on the central statistics agency, the total area of Indonesian coconut plantations in 2020 reached 3,391,993 Ha. This can be seen from the distribution of national coconut plants Riau 414,379 Ha, Jambi 119,642 Ha, West Java 149,153 Ha, East Java 244,836 Ha, Central Java 212,587 Ha, East Nusa Tenggara 143262 Ha, Maluku, 114,189 Ha, Southeast Sulawesi 219,181 Ha, North Sulawesi 266,968 Ha, and North Maluku 203173 Ha. Coconut plantations in Indonesia are very significant causing the increasing demand for white copra coconut, so that to survive the company must be able to improve production quality.

CV. Amarta is a coconut trading industry located in Riau province located in the Harapan Tani sub-district, Kempas District, Indragiri Hilir Regency which has a business area of more than 1 Ha, while the resulting product is white copra which is marketed to Jakarta and Bangladesh which is sold at prices varying between Rp. 10,000 / kg and Rp. 15,000 / kg using containers with a capacity of 24 tons which are carried out once every 1 month and once every 2 months depending on contract.

White copra production process CV. Amarta experienced product defects, namely burnt copra and broken copra. Companies that produce too many defective products can experience large losses. Company CV. Amarta sells two types of edible and regular white copra coconuts ranging from Rp. 15,000 – 14,000 / kg, if the product does not meet the standards, then the product will be sold below the price of white copra which is in the range of Rp. 10,000 – 9,000 / kg. This resulted in Company CV. Amarta experienced a decrease in the selling price value of white copra products by 33.33%. In January the total production was 140,490 and the number of copra defects amounted to

29,263, the number of productions exceeded the target of 111,227 with an estimated defect of 29,263 reaching a loss of Rp. 438,945,000.

The methods used to analyze the causes of disability are the six sigma method and Fuzzy FMEA. States that Method Six Sigma aims to reduce defects, improve production quality, reduce cycle times, maximize production capacity, and increase customer satisfaction. There are 5 stages in the method Six Sigma i.e. DMAIC consists of define, measure, analyze, improve, and control (Alfarizi et al., 2023).

Failure Mode and Effect Analysis (FMEA) is a systematic method used to identify as many failure modes as possible in a system or process, and prevent the possibility of such failure (Tarigan & Sukarsono, 2021).

Fuzzy FMEA is the application of the FMEA method Fuzzy in the DMAIC cycle facilitates the identification of production problems well at the definition and measurement stages. By measuring PPM metrics (Part Per million) or part of a million throughout the production process, we can give priority to handling failure modes that often occur from the beginning of Fuzzy FMEA (Godina et al., 2020).

The expected results in this study are to determine defects and potential failures, analyze the cause-and-effect factors that cause copra coconut defects in CV. Amarta to reduce the level of defective products using the Six Sigma method and provide recommendations for improving the cause of defects with the Fuzzy Failure Mode and Effect Analysis (FMEA) method as well as proposals for quality control of white copra at CV. Amarta.

LITERATURE REVIEW

White Copra

White copra is a type of copra with high quality. The process of processing coconut into white copra is considered an important step in increasing the added value of coconut products and has the potential to have a positive impact on the income of coconut farmers (Bakce, 2022).

Quality

Quality is the ability of a good or service to meet customer needs in accordance with certain predetermined parameters. Those parameters relating to performance, time, material, reliability, or other quantities can be used as standards (Montgomery, 2009).

Product quality control is the company's effort in regulating products so that the number of defective products is minimized. Therefore, to be able to compete, companies must have advantages in the quality of the products produced (Tamba et al., 2020).

In the book (Syafarudin & Syukri, 2022) Garvin defines eight dimensions that can be used to analyze product quality characteristics, which are as follows:

1. Performance
2. Features, traits or features and complementary characteristics.
3. Reliability
4. Conformance.
5. Durability.
6. Service Ability.
7. Aesthetics
8. Perceived Quality

Six Sigma

Six Sigma is an approach used to improve product quality to achieve the target of 3.4 failures per one million opportunities (DPMO) for each product, goods, or service transaction. This method consists of five main phases that must be passed, namely Define, Measure, Analyze, Improve and Control, to significantly improve the quality (Septiawan et al., 2022).

Table 1. Sigma Level Achievement

Sigma Achievement Level	DPMO (Defects Per Million Opportunities)
1-Sigma	691,462 (highly uncompetitive)
2-Sigma	308,538 (industry average in Indonesia)
3-Sigma	66.807
4-Sigma	6,210 (US industry average)
5-Sigma	233 (Japanese industry average)
6-Sigma	3.4 (World-class industry)

(Pardiyono R., 2021)

Fuzzy FMEA

The Fuzzy FMEA method allows for more detailed and accurate calculation of RPN (Risk Priority Number), as well as expanding the analysis of various factors that can be involved in failure risk assessment (Godina et al., 2021).

RESEARCH METHOD

This research methodology starts from:

1. Preliminary survey
   Preliminary survey is the initial stage in a study in describing a real system aims to obtain a clear picture of the process and problems faced, researchers make observations to the research location, namely CV. Amarta to obtain information related to the research project.
2. Literature study
   Literature study is a method used to obtain secondary data related to research conducted at CV Company. Amarta. The literature study studies such journals related to the Six Sigma method and Fuzzy FMEA.
3. Problem identification.
   This stage aims to facilitate researchers in conducting research to find out the problems that occur in CV Company. Amarta. The production process of white copra on CV. Amarta experienced several product defects or *defects*, burnt copra, copra and broken copra.
4. Problem formulation
   This stage is carried out after the problem to determine the product quality problem that will be solved in this study. The problem formulation is a reference point in research in determining the method to be used to solve quality control problems. To reduce the level of defective products of the copra coconut production process on CV. Amarta then used the Six Sigma method and Fuzzy FMEA.
5. Goal setting
   This study aims to identify defective products that have a major impact on the production process on CV. Amarta, in addition, identifies the risk of failure of the white copra production process, and measures the Sigma value of the white copra production process and provides quality control proposals in an effort to reduce product defects.

6. Data collection
   Data collection is carried out during field observations to support discussions and find solutions to the problems faced. The data collection carried out in this study is the Company's profile, organizational structure, production data from January 2021 to December 2021 in CV. Amarta.
7. Data processing
   Data processing based on the DMAIC method contained in six sigma:
   a. The first stage of Define is to identify the problem, create a project charter and a SIPOC diagram.
   b. The Second Stage of Measure is carried out DPU, DPO, DPMO calculation, Sigma level, and p-control charts calculation.
   c. The third stage of Analyze is to analyze the causes of product defects by making tree diagrams and fishbones.
   d. The fourth stage is Improve with the Fuzzy FMEA method.
   e. And the control stage by making proposals based on the Poka Yoke method.
8. Analysis
   Analysis is a description of the results processed with the aim of obtaining the best solution to reduce product defects in the production process on CV. Amarta.
9. Conclusions and Advice
   At this stage contains conclusions obtained from a series of studies on defective products in the white copra coconut production process that have been carried out and provides suggestions to CV. Amarta for the Company's development and future research.

RESULTS

1. Define

A project charter is a document detailing the scope, objectives, expected outcomes, as well as the overall approach to be used in completing a project (Solihin et al., 2022).

Table 1. Project Charter

Project Charter			
Research Information			
Company	CV. Amarta Indragiri Hilir	Purpose	Processing coconut into white copra
Executive Summary		Review	
CV. Amarta Indragiri Hilir was established in 2013 which is located at Harapan Tani, Kempas, Indragiri Hilir, Riau		CV. Amarta is a coconut trading industry. Amarta has product defects such as, burnt copra and broken copra. If you produce a lot of defective products, you can experience losses. This is the problem behind this study, then identifies the risk of production process failure, and measures the value of Sigma in white copra production and provides quality control proposals. Coconut processing into white copra export to Bangladesh.	
Risk: 1. Deterioration in the Quality of Production 2. Material losses and costs to the Company			

This stage, a deep identification and understanding of the customer's specific needs is carried out, as well as the creation of a SIPOC diagram that explains the process holistically, starting from Input until Output, as well as the parties involved in the process (Teja et al., 2022)

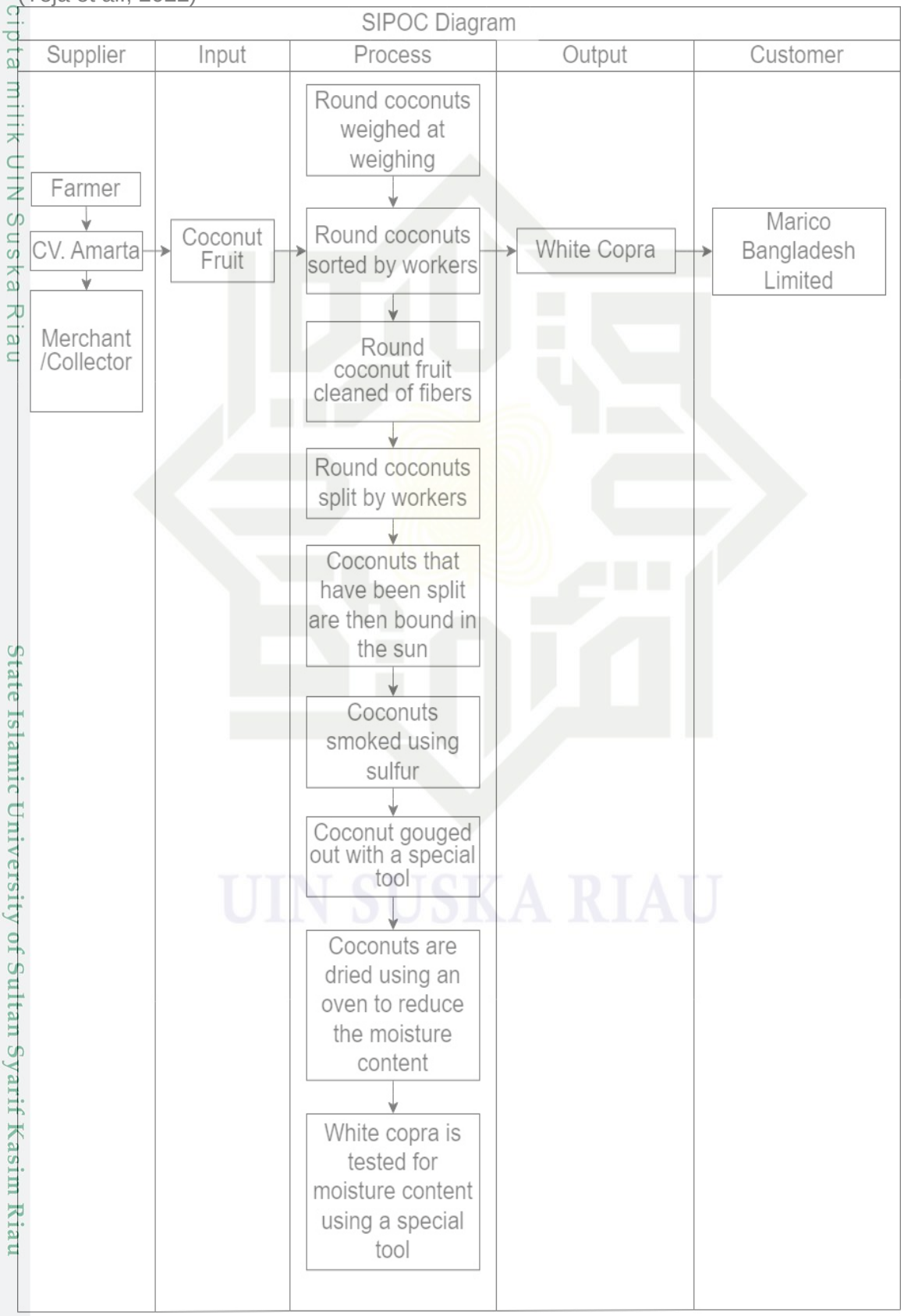

Figure 1. SIPOC Diagram CV. Amarta

2. Measure

The measure stage is the second stage in Six Sigma. The measure stage is carried out by calculating the DPU, DPO, DPMO value and sigma level, and p-control charts.

a. Calculation of DPMO Value and Sigma Level

Table 2. Table Of DPMO and Sigma Levels on Burnt Copra Defects

No.	Moon	DPU	CTQ	DPO	DPMO	Level Sigma
1	January	0,084	2	0,0295	29539,469	3,388
2	February	0,084	2	0,0295	29481,7258	3,388
3	March	0,085	2	0,0284	28391,8406	3,405
4	April	0,084	2	0,0284	28429,6029	3,404
5	May	0,085	2	0,0295	29479,4081	3,389
6	June	0,083	2	0,0285	28476,8066	3,404
7	July	0,086	2	0,0300	30023,3645	3,380
8	August	0,084	2	0,0302	30187,2844	3,378
9	September	0,084	2	0,0282	28174,162	3,408
10	October	0,083	2	0,0293	29280,9043	3,391
11	November	0,084	2	0,0282	28246,331	3,407
12	December	0,085	2	0,0304	30448,1434	3,374
Average						3,393

b. Calculation of DPU, DPO, DPMO and Sigma Level values on broken copra defects

Table 3. Table Of DPMO and Sigma Levels on Broken Copra Defects

No.	Moon	DPU	CTQ	DPO	DPMO	Level Sigma
1	January	0,059	2	0,0167	16727,169	3,627
2	February	0,059	2	0,0170	16964,488	3,621
3	March	0,057	2	0,0167	16722,011	3,627
4	April	0,057	2	0,0164	16414,711	3,634
5	May	0,059	2	0,0174	17382,778	3,611
6	June	0,057	2	0,0170	17031,951	3,619
7	July	0,060	2	0,0168	16838,006	3,624
8	August	0,060	2	0,0171	17077,378	3,618
9	September	0,056	2	0,0167	16721,746	3,627
10	October	0,059	2	0,0168	16804,954	3,625
11	November	0,056	2	0,0163	16273,453	3,638
12	December	0,061	2	0,0162	16190,781	3,640
Average						3,626

At the next stage determine the p-control charts. The calculation of the p-control charts is:

Table 4. Recapitulation of Burnt Copra and Broken Copra Defects

No.	Moon	Production Quantity (kg)	Burnt Copra (kg)	Broken Copra (kg)
1	January	140.490	11.838	8.300
2	February	137.051	11.525	8.081
3	March	105.400	8.940	5.985
4	April	221.600	18.661	12.600
5	May	112.180	9.510	6614
6	June	227.220	18.930	12.941
7	July	64.200	5.525	3.855
8	August	40.580	3.395	2.450
9	September	131.326	11.060	7.400
10	October	166.320	13.764	9.740
11	November	161.490	13.580	9.123
12	December	78.100	6.670	4.756
Total		1.585.957	133.398	91.845
Average		132.163	11.117	7.654

a. P-Control Chart of Burnt Copra Defects

Tabel 5. Table CL, P, UCL and LCL Burnt Copra Defects

No.	Moon	CL	P	UCL	LCL
1	January	0,084	0,084	0,086	0,082
2	February	0,084	0,084	0,086	0,082
3	March	0,084	0,085	0,087	0,082
4	April	0,084	0,084	0,086	0,082
5	May	0,084	0,085	0,087	0,082
6	June	0,084	0,083	0,086	0,082
7	July	0,084	0,086	0,087	0,081
8	August	0,084	0,084	0,088	0,080
9	September	0,084	0,084	0,086	0,082
10	October	0,084	0,083	0,086	0,082
11	November	0,084	0,084	0,086	0,082
12	December	0,084	0,085	0,087	0,081

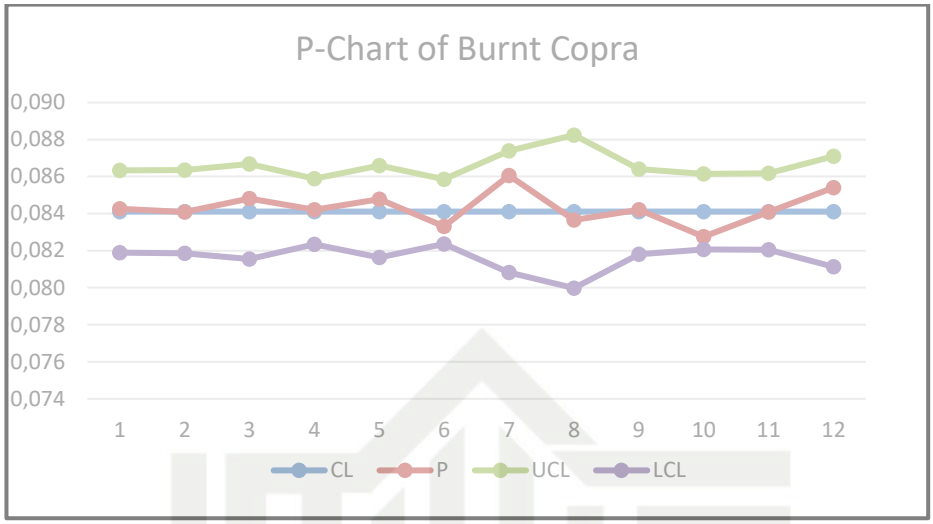

Figure 2. P-Control Charts Burnt Copra

b. P-Control Chart of Broken Copra Defects

Table 7. CL, P, UCL and LCL Broken Copra Defects

No.	Moon	CL	P	UCL	LCL
1	January	0,058	0,059	0,060	0,056
2	February	0,058	0,059	0,060	0,056
3	March	0,058	0,057	0,060	0,056
4	April	0,058	0,057	0,059	0,056
5	May	0,058	0,059	0,060	0,056
6	June	0,058	0,057	0,059	0,056
7	July	0,058	0,060	0,061	0,055
8	August	0,058	0,060	0,061	0,054
9	September	0,058	0,056	0,060	0,056
10	October	0,058	0,059	0,059	0,056
11	November	0,058	0,056	0,061	0,055
12	December	0,058	0,061	0,061	0,054

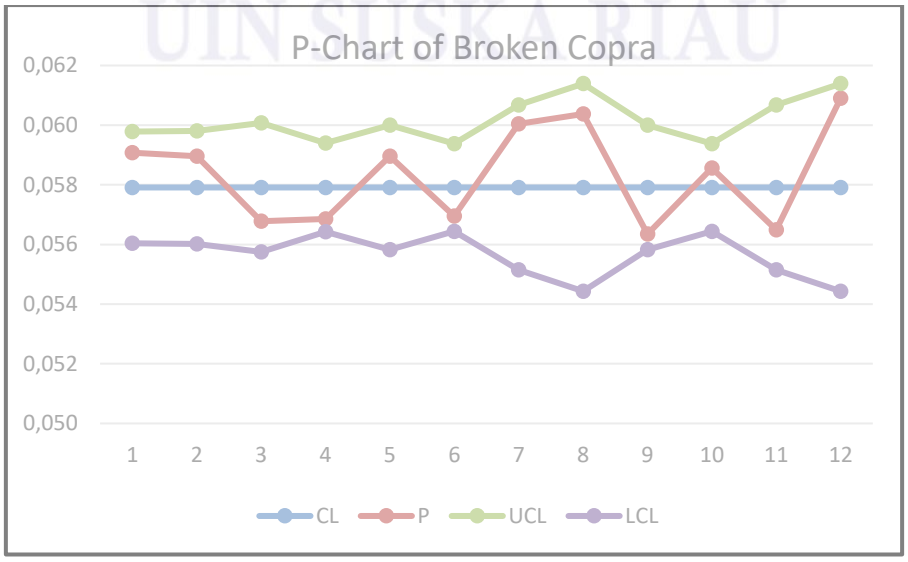

Figure 3. P-Control Charts Defect Broken Copra

3. Analyze

The analysis stage is used to determine the factors that cause defects in white copra coconut products. The thing that needs to be done is to analyze the data that has been collected. Tree Diagram is a method of identifying the steps and tasks that need to be performed to achieve the main objectives and related sub-goals (Arera & Suseno, 2023).

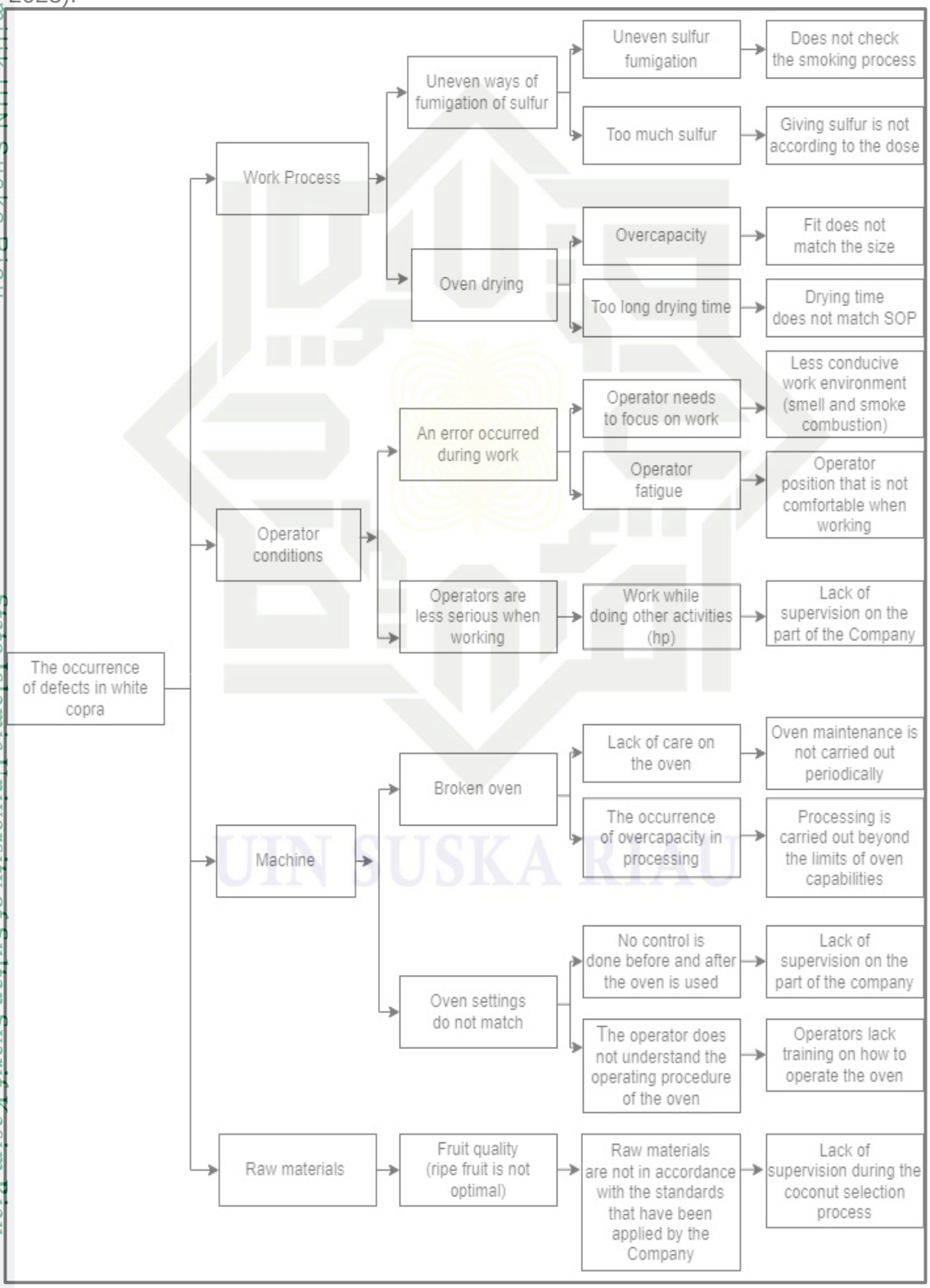

Figure 4. Tree Diagram

A causal diagram is a visual representation illustrating a cause and effect relationship between two or more variables. In the context of statistical process control, causal diagrams are used to show the causal factors (cause) and quality characteristics (effect) influenced by these factors (Sinaga et al., 2023)

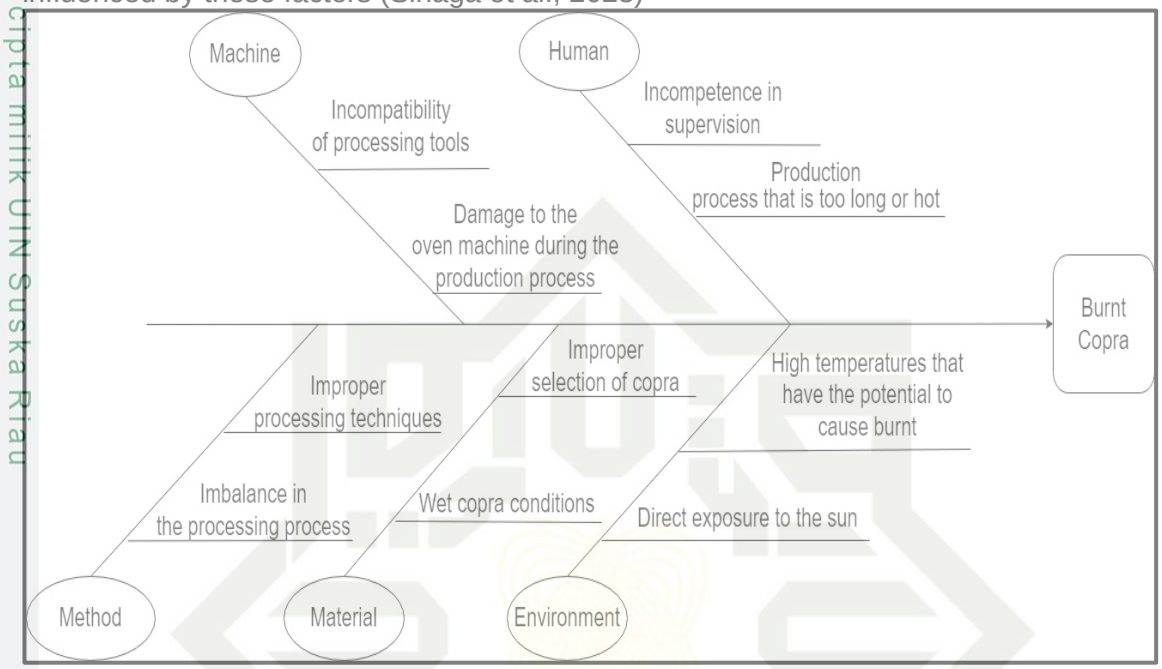

Figure 5. Fishbone of Copra Burnt Defect

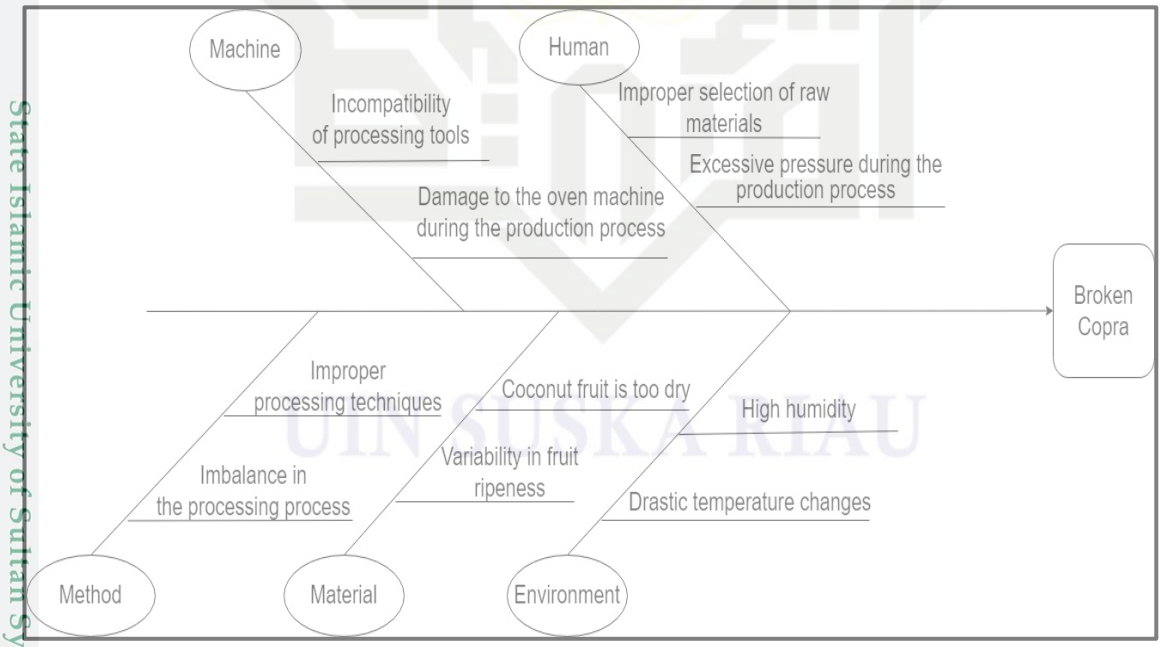

Figure 6. Fishbone of Broken Copra Defect

4. Improve

After knowing the causes of the product, a plan or proposal is made to make improvements in order to reduce the level of damage to the product.

a. FMEA

FMEA analysis has the primary purpose of providing a detailed assessment of the potential impact of failure (Severity), the frequency of possible failure (Occurrence), and failure detection capabilities (Detection), as well as giving weight to each of these factors (Susanto & Purnomo, 2022).

Tabel 8. Recapitulation of FMEA

No.	Types of *Defects*	Cause	S	O	D	RPN	*Recommended Action*
1	Burnt Copra	Incompetence in supervision	8	7	6	336	Training operators
		Prolonged or hot production processes	8	8	8	512	Supervise production
		Inaccurate temperature control	6	9	7	378	Supervise / control at the time of production
		Damage to the dryer	8	6	6	288	Perform regular machine maintenance
		Damage to the dryer	8	6	6	288	Perform regular machine maintenance
		High temperatures that have the potential to cause burnt	8	9	6	432	Supervise / control at room temperature
		Improper selection of copra	6	7	7	294	Supervise the sorting process
		Wet copra conditions	6	6	6	216	Supervise the sorting process
		Lack of testing and correction	6	7	7	294	Increase supervision at production time
		Uncontrolled processing process	7	6	7	294	Improve monitoring at the time of processing
2	Broken Copra	Improper selection of raw materials	5	5	8	200	Supervise the sorting process
		Excessive pressure on processing	8	9	8	512	Pay attention to the processing process
		Incompatibility of processing tools	7	7	7	343	Checking the tool during processing
		Damage to the oven machine during processing	8	7	7	392	Replacing the oven with a new one
		High humidity	6	5	6	180	Supervise processing
		Drastic temperature changes	5	6	5	150	Conducting temperature checks at the time of processing
		Coconut fruit is too dry	8	7	7	392	Supervise the sorting process

Tabel 8. Recapitulation of FMEA Continued

No.	Types of *Defects*	Cause	S	O	D	RPN	*Recommended Action*
	Broken Copra	Variability in fruit ripeness	6	6	6	216	Supervise the sorting process
		Improper coconut processing techniques	7	7	7	343	Perform optimal processing techniques at the time of processing
		Imbalance in the processing process	7	8	7	392	Perform checks during the processing process

b. Fuzzy FMEA Method

Fuzzy FMEA calculations are based on the previous Failure Mode and Effect Analyst questionnaire. The FMEA Fuzzy Method Steps are as follows:

1. Open Mathlab Aplication

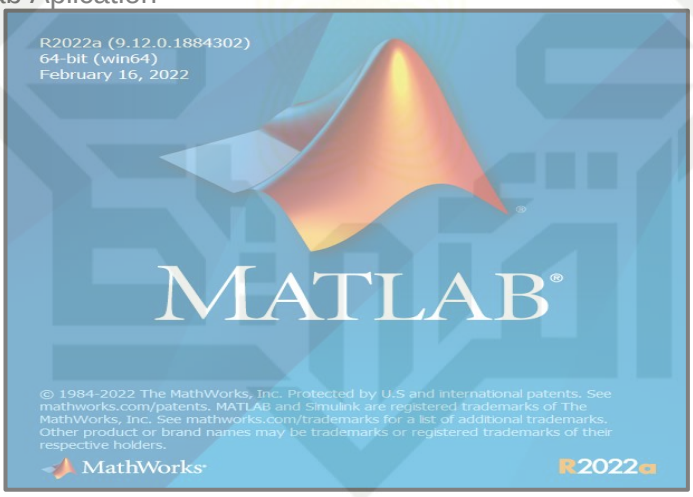

Figure 7. Mathlab Aplication

2. Type “fuzzy” on Command Window

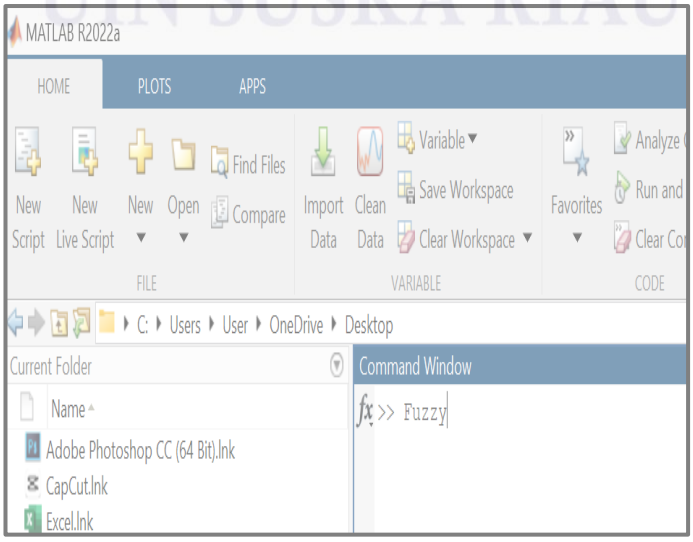

Figure 8. Mathlab Aplication

3. Display of Fuzzy

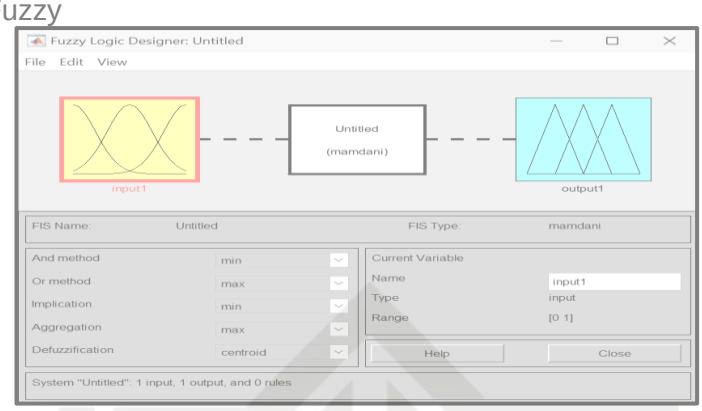

Figure 9. Display of Fuzzy

4. Click edit, add variable and input up to 3

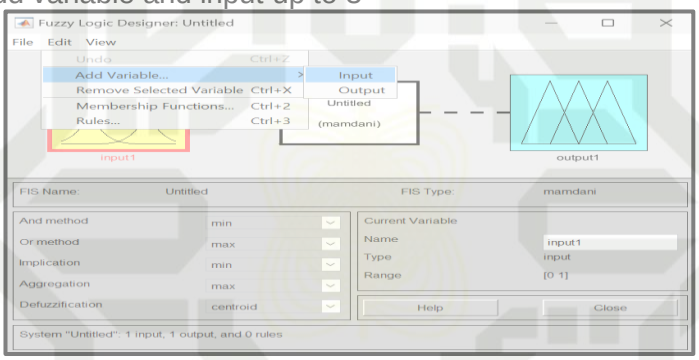

Figure 10. Add Variables

5. Change the titile from input 1, input 2, input 3 to Severity, Occurrence and Detection and the last output1 to FRPN

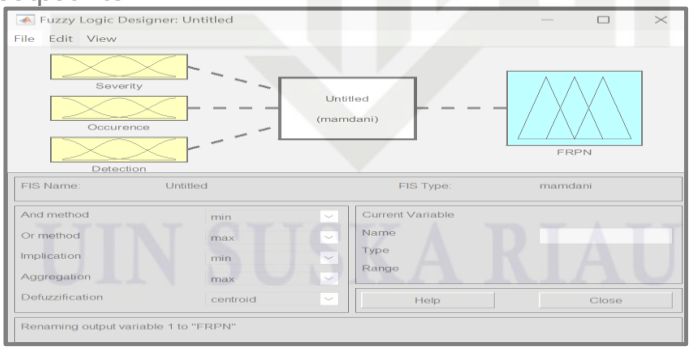

Figure 11. Inputs and Outputs

6. Input the Severity Number

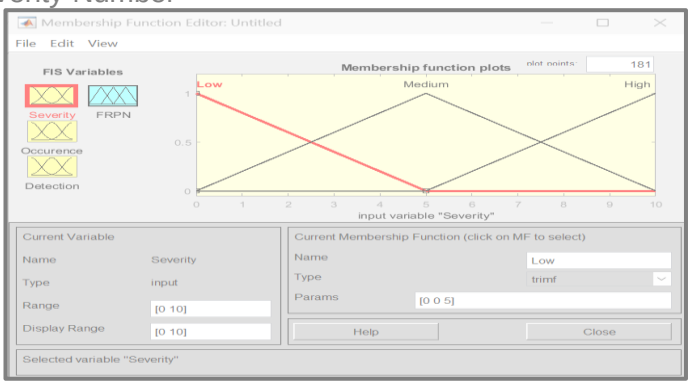

Figure 12. Input Severity

7. Input the Occurrence Number

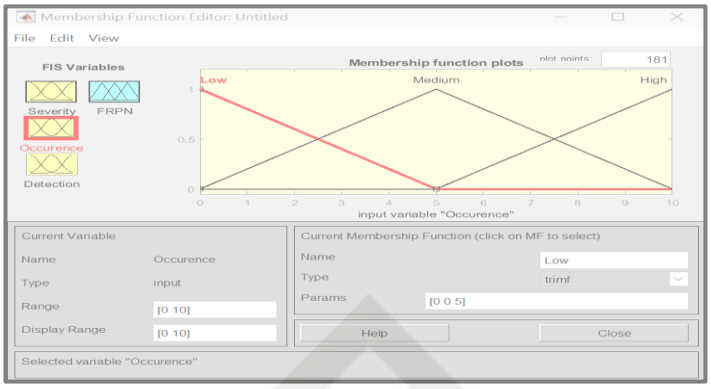

Figure 13. Input Occurrence

8. Input Detection Number

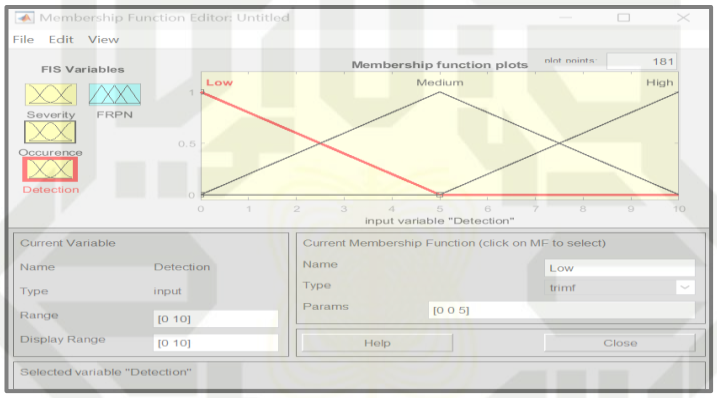

Figure 14. Input Detection

9. Input Output Number

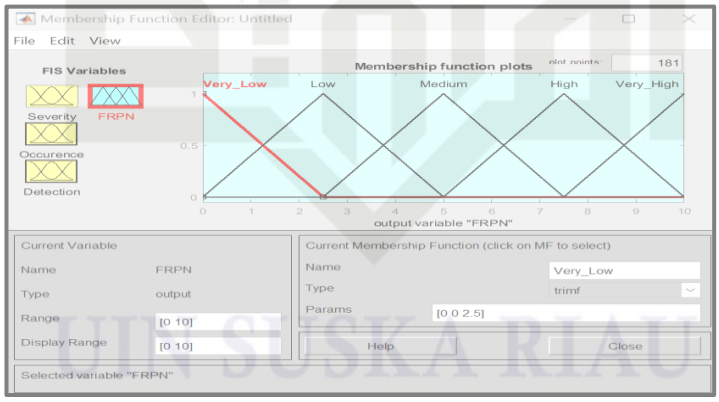

Figure 15. Input Detection

10. Rule of Fuzzy

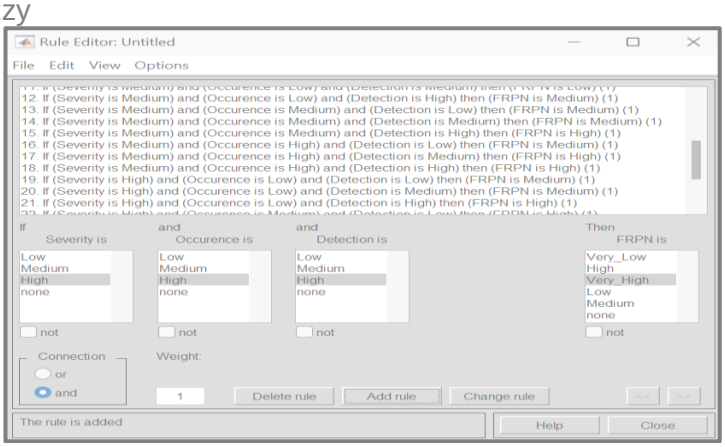

Figure 16. Rule of Fuzzy

11. Input FMEA Value to Fuzzy

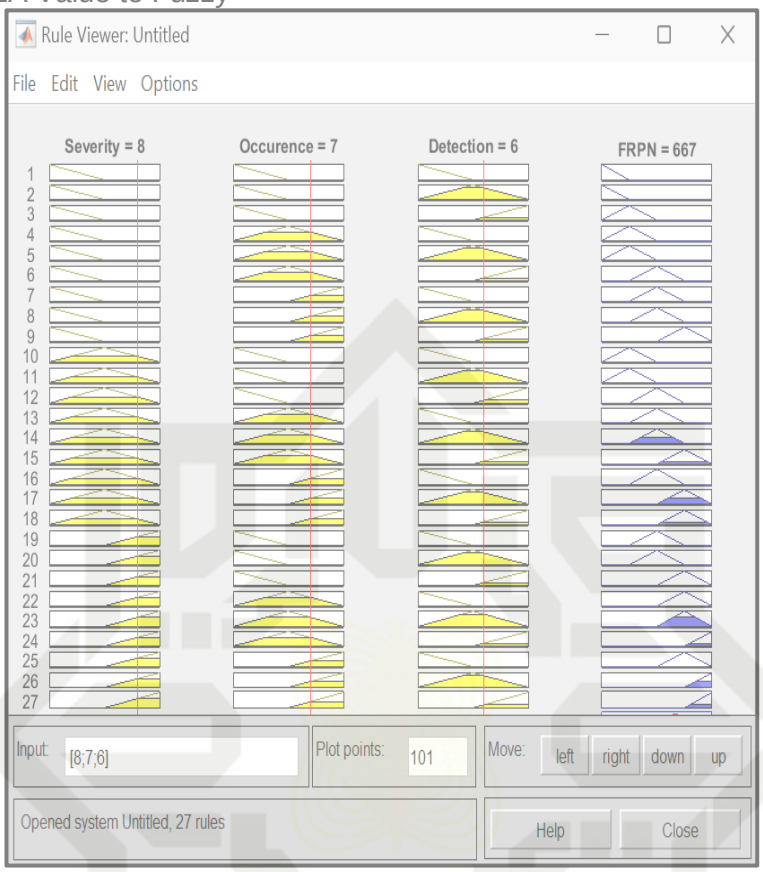

Figure 17. FMEA *to* Fuzzy Input Rule

12. FRPN Recapitulation Results

Table 9. Recapitulation of Fuzzy FMEA Calculations

No.	Types of defects	Cause	S	O	D	FRPN	Category
1	Burnt Copra	Incompetence in supervision	8	7	6	667	*Very High*
		Prolonged or hot production processes	8	8	8	676	*Very High*
		Inaccurate temperature control	6	9	7	690	*Very High*
		Damage to the dryer	8	6	6	652	*Very High*
		Damage to the dryer	8	6	6	652	*Very High*
		High temperatures that have the potential to cause burnt	8	9	6	720	*Very High*
		Improper selection of copra	6	7	7	612	*Very High*
		Wet copra conditions	6	6	6	569	*High*
		Lack of testing and correction	6	7	7	612	*Very High*
		Uncontrolled processing process	7	6	7	629	*Very High*

Table 9. Recapitulation of Fuzzy FMEA Calculations Continued

No.	Types of defects	Cause	S	O	D	FRPN	Category
2	Broken Copra	Improper selection of raw materials	5	5	8	645	*Very High*
		Excessive pressure on processing	7	9	7	705	*Very High*
		Incompatibility of processing tools	7	7	7	629	*Very High*
		Damage to the oven machine during processing	8	7	7	667	*Very High*
		High humidity	6	5	6	569	*High*
		Drastic temperature changes	5	6	5	560	*High*
		Coconut fruit is too dry	8	7	7	667	*Very High*
		Variability in fruit ripeness	6	6	6	569	*High*
		Improper coconut processing techniques	7	7	7	629	*Very High*
		Imbalance in the processing process	7	8	7	629	*Very High*

5. Control

The purpose of the control phase is to ensure that efforts to improve control of the production process take place consistently and continuously. The control stage is carried out using the method Poka Yoke (Sanusi et al., 2020).

a. Alternatives are carried out on the production floor.

1) Marking slippery production floors

Figure 18. Slippery Floor Signs

2) Cleaning car entrances and separation of coconut fibers at production sites

3) Marking the mandatory use of personal protective equipment at each station.

Figure 19. Mandatory Marks

b. Alternatives that can be done on production machines
   1) Perform regular oven machine maintenance
   2) Replacing a broken tumble dryer
   3) Checking the machine before and after use
   4) Provide a heat level monitoring device during the production process that uses temperature alarms that can be installed to warn employees if they exceed or exceed predetermined limits. Aims to prevent damage or problems that occur in the production process.

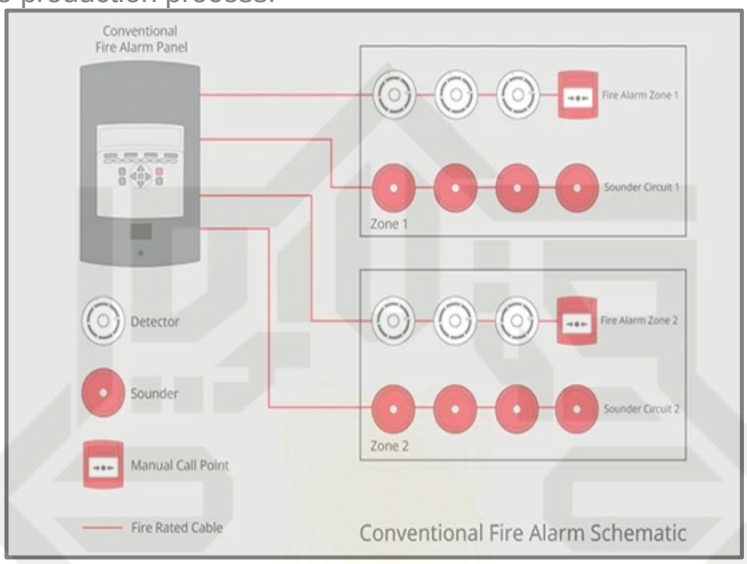

Figure 20. Heat Monitor Alarm

DISCUSSION

1. Define

Making a Project Charter aims to facilitate researchers in determining and defining problems that occur in CV Companies. The SIPOC diagram in CV. Amarta starts from Suppliers are the origin of raw materials to be used, namely coconuts from Harapan Tani. Input is coconuts. Process is a process that occurs to turn round coconuts into white copra. The output white copra. Next is the customer Marico Bangladesh Limited.

2. Measure

Based on the DPMO value and sigma level that has been calculated in Chapter 4, it is obtained that the sigma value has an average of 3.393. From the sigma value, it is obtained that the sigma level is at the 3-sigma level, which means that the sigma level is still far below the target of 6-sigma.

The figure 4 and 3 shows that the data in the production process is controlled because the proportion value is below the UCL and above the LCL. The production process is said to be controlled if the data is at the UCL and the LCL.

3. Analyze

Tree diagrams are made to analyze the factors that cause defects in the white copra coconut production process:

a. Work Process

Not checking the fumigation process and too much sulfur, giving sulfur not according to the dose, resulting in less than optimal copra results.

b. Operator Conditions

Errors during work where the operator is less focused when working because the work environment is less conducive and the operator is less serious in working.

c. Oven Machine
The oven machine is damaged when there is a lack of maintenance on the oven which should be done regularly.
d. Fruit Quality Factor
Ripe fruit is not optimal when the raw materials do not meet the standards set by the Company due to lack of supervision during the sorting process.

Fishbone Diagram of Burnt Copra:
a. Human
Incompetence in supervision during the processing process which can cause exposure of copra too long or excessive heat and processing that is too long or hot, errors in determining the duration or temperature of drying copra can cause burnt or charring.
b. Machine
Inaccurate temperature control on the drying machine, causing burnt copra and damage to the drying machine or not calibrated properly can produce excessive heat which causes burnt copra.
c. Environment
High temperatures that have the potential to cause burnt and direct exposure to the sun when placing copra that is being dried in the sun without protection can increase the risk of burning.
d. Materials
Improper selection of copra, copra is too ripe or too dry as raw material can increase the risk of burning, and the condition of copra that is wet or exposed to water before the drying process can cause burnt results.
e. Method
Lack of testing and correction, drying methods not tested regularly and adjusted can produce burnt copra and uncontrolled or unplanned processing can increase the risk of burnt copra.

Fishbone Diagram of Broken Copra:
a. Human
Improper selection of raw materials, errors in choosing optimally ripe coconuts, resulting in broken copra and excessive pressure during the production process can cause cracks or breaks.
b. Machine
Incompatibility of processing equipment with copra characteristics, it can produce excessive pressure or vibration which results in broken copra and damage to the oven machine during the production process, causing cracks in copra.
f. Environment
High humidity can cause water absorption by copra which can then cause copra to break during the processing process and drastic temperature changes can cause volume changes in copra and cause cracks or breaks.
c. Materials
Too dry or old coconuts can increase the risk of rupture during the production process and variability in fruit maturity that is not uniform can cause cracks in copra in the production process.
d. Method
Improper processing techniques with copra characteristics can cause rupture and discrepancies in the processing process, imbalances in pressure, temperature and time in the processing process can cause copra to break.

4. Improve
Based on fuzzy calculations, FMEA ranks first, namely burnt defects with high temperature causes that have the potential to cause burnt with FRPN values of 720.

The second rank is a rupture defect with the cause of excessive pressure when processing FRPN 705 values.

5. Control

To apply the Poka Yoke method by providing alternative proposals such as slippery road signs on the production floor and carrying out machine maintenance on drying ovens periodically and checks before and after the production process, marking the mandatory use of personal protective equipment at each production floor station, maintaining cleanliness of both operators and equipment that used in the product process, replacing machine tools that have been damaged for a more optimal production process, adding heat monitoring devices during the production process using temperature alarms.

CONCLUSION

The defects that most affect the defects in the white copra production process are burnt copra and broken copra. Based on the calculation of the Fuzzy FMEA method that has the potential to cause defects are burnt defects and rupture defects. The first rank is burnt defects with high temperature causes that have the potential to cause burnt with an FRPN value of 720. The second rank is a rupture defect with the cause of excessive pressure when processing FRPN 705 values. Based on the rating obtained from fuzzy RPN, it shows that the failure has the main potential for improvement. The degree of defect of white copra products on CV. Amarta based on the calculation of DPMO value and sigma level in burnt defects by obtaining a sigma level of 3,393 and in rupture defects obtaining a sigma level of 3.626 which means that the sigma level is still far below the target of 6-sigma due to the production of white copra coconut on CV. Amarta experienced defects that affected the quality of production at CV Company. Amarta. The proposal for defect quality control in the copra production process is to apply the Poka Yoke method by providing alternative proposals such as replacing machine tools that have been damaged for a more optimal production process and adding heat monitoring devices during the production process using temperature alarms that can be installed to warn employees if they exceed or exceed predetermined limits. Aims to prevent damage or problems that occur in the production process.

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Subject: **Letter of Acceptance**
ID 781: **Minimizing Defects In White Copra Coconut Products Using Six Sigma And Fuzzy Fmea Methods (Case Study: Cv. Amarta Indragiri Hilir)**

Pinardita, Nazaruddin, Anwardi, Suherman, Muhammad Nur
Universitas Islam Negeri Sultan Syarif Kasim

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On behalf of Editors, we are delighted to inform you that your article has been accepted, to be publishing through the periodical International Journal of Engineering Business and International Management (IJEBIM) Volume 10 Number 1.

Thank you for submitted and registration.

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