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IMPROVING THE QUALITY OF TEMPE PRODUCTS USING THE IMPLEMENTATION METHOD OF *GOOD MANUFACTURING PRACTICE* (GMP) AND *MODEL BASED AND INTEGRATED PROCESS IMPROVEMENT* (MIPI) IN TEMPE SROMO SMEs

ANANDA YOGA PRANANTA [a] ABDUL WAHID
Pasuruan , Indonesia
[b, c] Department of Mechanical Engineering , Yudharta University Indonesia
Writer Related : anandayg_01@rocketmail.com

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ABSTRACT

Mr. Muizzi's Tempe Sromo UKM is one of the largest Tempe UKM in Sromo. However, SMEs (Small and Medium Enterprises) Tempe Sromo in the production process do not pay attention to environmental cleanliness so that it affects the quality of the tempe products produced. Therefore it is necessary to carry out a Good Manufacturing Practice (GMP) assessment which aims to provide a concept of proposed improvements using the Model Based and Integrated Improvement (MIPI) method as an effort to improve the quality of the products produced. Based on the results of the Good Manufacturing Practice (GMP) assessment of Mr. Muizzi's Tempe Sromo, the overall value of the total application of GMP for all respondents obtained is 8145 points or an average of 247 points per respondent, while the percentage of deviation value is 46% and the value 54% conformity to the aspects of Good Manufacturing Practice (GMP) in Mr. Muizzi's Tempe East Sromo UKM which means that it does not meet the GMP criteria. Evaluation obtained from processing GMP data, the level of
severity in the application of Good Manufacturing Practice (GMP) to Mr. Muizzi's Tempe Sromo SME which is 247 points, which means that it is at the classification level ((nx2) +1) to (nx3), which is very high. less fulfilling. The highest deviation value in the top five is in the laboratory aspect with a deviation value of 73%, 68% label, 49% storage, 48% building, and aspects of sanitation facilities with the aspect of production equipment getting the same deviation value of 47%.

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1. Introduction

Indonesia is one of the largest tempeh producing countries in the world.
(Winanti, 2014). According to data from Rumah Tempe Indonesia, the tempe industry in Indonesia is currently
totaling approximately 115,000 tempeh craftsmen. The tempeh industry in Indonesia is generally still on a household scale, the production process of which is still carried out by
traditional methods (Damarasri & Partiwi, 2013). Tempe SMEs in Indonesia need to be developed to become a major role in advancing the nation's economy, so that it becomes a very large potential for the Indonesian people. Tempe, which is a type of food for most Indonesian people, in its production process must be considered to produce a quality product and guaranteed safety, to be able to produce quality and safe tempe products, a system is needed to be used to supervise the production process from input, process, and output. The system must be able to supervise and ensure that every tempe production process must meet food safety standards in accordance with Government Regulation No. 28 of 2004 Article 43 concerning food safety, quality, and nutrition which contains the obligation for small-scale household industries to have a Household Industry Food Production Certificate (SPP-IRT) issued by the regional head according to the location of the SME (Damarasri & Partiwi, 2013).

The Household Industry Food Production Certificate (SPP-IRT) is a certificate issued by the regional head in this case the regent or mayor. SPP-IRT is used for SMEs or household-scale industries as a guarantee that the products produced have been registered and can expand the marketing network. In the process of submitting the SPP-IRT, many aspects need to be prepared as assessment points, including location and environment, buildings, facilities, equipment, sanitation, employees who work must comply with the standards of Good Food Production Practices for Household Industries (CPPB-IRT) (Damarasri & Partiwi, 2013). This aspect has also been regulated by the government based on Law No. 7 of 1996 on Food Safety, which explains the requirements that must be carried out by
Every food processing industry must carry out sanitation activities and prepare facilities that include the start of production, storage, transportation and distribution of products.

The system that complies with the Good Manufacturing Practices for Household Industries (CPPB-IRT) standards that can supervise and maintain that the products produced comply with existing standards is Good Manufacturing Practice (GMP). Good Manufacturing Practice (GMP) is a system that contains basic requirements in a food industry that implements supervision of the entire processing process in order to produce a quality product that is safe for consumption (Novani, 2017). The basic requirements in the implementation of Good Manufacturing Practice (GMP) consist of several aspects that need to be considered for an industry engaged in food processing.

Aspects that need to be considered in the implementation of Good Manufacturing Practice (GMP) in accordance with the CPPB-IRT regulatory standards include the environment, location, buildings and business facilities, business unit facilities, sanitation facilities and activities, pest control systems, employee hygiene requirements, raw material requirements, production process control, post-production control, supervision management, recording and documentation. Basic requirements that are included in the scope of Good Manufacturing Practice (GMP) include the quality of raw materials or auxiliary materials, product processing procedures, product packaging, product storage stages, and product distribution stages (Heriyanto, 2016).

Tempe UKM in Pacarkeling Village is one of the centers of Small and Medium Enterprises (UKM) that is currently developing, located in Kejayan District, Pasuruan Regency, in Pacarkeling Village there are many tempe craftsmen, precisely in Sromo Timur Hamlet. One of the tempe craftsmen in Sromo Timur Hamlet is Mr. Muizzi. During direct observation in the environment

around the Small and Medium Enterprises, cleanliness did not receive enough attention from the owners of Small and Medium Enterprises (UKM), so this affected the quality of tempe products

produced. Factors that influence the quality of the tempeh products produced include: layout of facilities, environmental cleanliness, inadequate sanitation facilities, lack of packaging on the product. Based on the description of direct observations in the field, the Small and Medium Enterprises (SMEs) of East Tempe Sromo need a study on how to implement the existing Good Manufacturing Practice (GMP). Model Based Integrated And Process Improvement (MIPI) is a method used for the improvement process in developing an integrated business (Simarmata, 2014). In the Model Based Integrated And Process Improvement method, a proposal will be presented on what improvements need to be made for this Small and Medium Enterprises (SMEs) of East Tempe Sromo.

2. Review Literature

Small and Medium Enterprises (SMEs)

Small and Medium Enterprises or UKM is a business that has asset amounting to Rp. 600 million and its capital not enough from Rp 25 million . The beginning emergence Small and Medium Enterprises term or SMEs in Indonesia in 1993 and started famous at the time crisis monetary 1998. Sources of capital for SMEs come from from personal called as *bootstrapping*. *Bootstrapping* is a strategy used by SMEs to develop his efforts with use factor internal strength (Thrisya Gulla and Dewi Meisari (Haryanti , 2018). However along with As time goes by , SME capital sources do not only from personal but also sourced from *investors* or also called *venture capital* . Small and Medium Enterprises (SMEs) are one of the segment business that has very significant contribution to development Indonesian economy (Jaidan Jauhari, 2010)

Definition of Tempe

Tempeh is a type of fermented soybean food that is very well known by the Indonesian people. Through this fermentation stage, soybeans undergo a decomposition stage into a compound form so that they are easily digested by the body. Tempeh is a type of food that is full of nutrients that are beneficial for the body. The nutrients contained in tempeh include protein, carbohydrates, fat, vitamins, and minerals (Oktaviani, 2018). According to the National Standardization Agency (1992)

Contents Dry Soybeans Every 100 grams Seed

No.	Content Type	Amount (*)	Amount (**)
1.	Calories (kcal)	331	-
2.	Protein (g)	34.9	46.2
3.	Fat (g)	18.1	19.1
4.	Carbohydrates (g)	34.8	28.2
5.	Calcium (mg)	227	254
6.	Phosphorus (mg)	585	781
7.	Iron (mg)	8.0	-
8.	Vitamin A (SI)	110	-
9.	Vitamin B1 (mg)	1.1	-
10.	Water (g)	7.5	-

3. Methodology

Activity study about improvement quality production in SMEs using approach *Good Manufacturing Practice* (GMP) is implemented at the Tempe UKM located in Sromo Timur Hamlet

, Pacarkeling Village , District Kejayan , Regency Pasuruan . Research This in progress start March -June 2020. Type of research used in the process of writing task end thesis This that is use method analysis as well as approach quantitative . The data used are primary data and secondary data . Primary data is a data collection process the data direct taken with method interview , communication directly via telephone and not do communication via letters , e-mail and others (Sugiyono , 2013) in (Tanujaya , 2017), while secondary data is type of data captured from literature , internet, statistics , books , etc. Primary data used in study obtained from results interview to UKM Tempe Sromo owner and results from distribution questionnaire to a number of respondents , while secondary data obtained from internet literature as well journal or study previous about standard implementation *Good Manufacturing Practice* (GMP) in a industry food . Deep data collection study This done with a number of method that is method observation , interviews , and dissemination questionnaire . Terms evaluation in questionnaire study with *Likert scale* level 0-4 is as following :

4 = Strongly Agree (SS)
3 = Agree (S)
2 = Neutral (N)
1 = Disagree (TS)
0 = Strongly Disagree (STS)

Stages determination Respondent in study This use method *purposive sampling* . The *purposive sampling method* is a method in determination Respondent study with determined criteria (Mukhsin , Mappigau , & Tenriawaru , 2017). The researcher's *purposive sampling* method to determine Alone criteria What just in determine respondents who will do evaluation to aspect *Good Manufacturing Practice* (GMP) at Tempe Sromo UKM .

Testing questionnaire in study This using two methods that is Validity test method and reliability test. Validity test method is something related with how far the tool measuring can give results appropriate target (Rahayu, 2016). Testing validity This done with a correlation test using method *one shot* (measurement one time) namely with enter the data obtained from distribution questionnaire to in the SPSS program, besides it can also done with count correlation to each and every question with score value on each questions on the questionnaire with use formula correlation *Product Moment* (Rahayu, 2016). The formula from technique correlation *Product Moment* , namely as following :

$$r=N\Sigma XY-(\Sigma X\Sigma Y)N\Sigma X\ 2-(\Sigma X)^2\ N\Sigma Y2-\Sigma Y^2$$

Information :
N = Number Respondents
X = Score of each question
Y = Total score

Testing reliability is a the size that gives information how far the results from A measurement still consistent although has done measurement repeatedly with use tool the same measurement (Janti, 2014). Reliability is testing conducted For see how much big a measurement consistent or stable to results size . The size a value at level reliability can seen from mark its usual coefficient called coefficient reliability . Testing at the level of reliability This usually in A study use *Cronbach's Alpha* test method that uses question in questionnaire

with closed model with method evaluation scale *Likert* . The formula is in count coefficient reliability *Cronbach's Alpha* (*ri*) is as following :

$$ri = \frac{k}{(k-1)}\left(1-\frac{\Sigma si^2}{st^2}\right)$$

Information :

k = number of grain questions on the questionnaire
ΣSi^2 = total Variants grain
St^2 = total variance

Stages next data obtained done analysis in a way descriptive . Assessment model implementation *Good Manufacturing Practice* (GMP) uses scale 0-4 (Nurdiyansyah , 2010 in Rahmayanti , 2018) namely as following :

0 = value implementation GMP aspect of 0%
1 = value implementation GMP aspect of 1-25%
2 = value implementation GMP aspect of 26-50%
3 = value implementation GMP aspect of 51-75%
4 = value implementation GMP aspect of > 75%

According to Lukman (2001) , the formula used is in count How many percentage conformity aspect *Good Manufacturing Practice* (GMP) at Tempe Sromo UKM with standards that have been determined by the government or BPOM , namely as as follows (Kusumadewi , 2017):

$$Y = (n0 \times 0) + (n1 \times 1) + (n2 \times 2) + (n3 \times 3) + (n4 \times 4)$$

Information :
Y = total value of the application obtained
n0 = number aspects that get value 0 in form evaluation
n1 = number aspects that get value 1 in form evaluation
n2 = number aspects that get value 2 in form evaluation
n3 = number aspects that get value 3 in form evaluation
n4 = number aspects that get value 4 in form evaluation

Stages next is total value of application (Y) adjusted with scale percentage GMP deviations that occur that is as as follows (Rahmayanti , 2018):

80-100 % = mark conformity aspect implementation of GMP that meets
60-79% = value conformity aspect adequate implementation of GMP fulfil
40-59% = value conformity aspect poor implementation of GMP fulfil
20-39% = value conformity aspect very poor implementation of GMP fulfil
0-19 % = value conformity aspect implementation of GMP that is not fulfil

Stages next is count level severity deviations that occur implementation of GMP obtained from calculation formula total application (Y) is with provision as as follows (Rahmayanti , 2018):

(nx 0) = 0 (light)/ meets
(nx 0)+ 1) sd (nx 1) = 1-113 (light)/ sufficient fulfil
(nx 1)+ 2) sd (nx 2) = 114-226 (medium)/ less fulfil
(nx 2)+ 3) to (nx 3) = 227-339 (severe)/very lacking fulfil
(nx 3)+ 4) to (nx 4) = 340-452 (critical)/ not to meet
Description : n = total number of aspects observed in the questionnaire evaluation GMP aspects

4. Results and Discussion

Stages further research This is data processing . Data processing is carried out with activity assessment *Good Manufacturing Practice* (GMP) with filling questionnaire . From the results filling questionnaire furthermore done summation of each aspect For determine weight values in each aspect . Here are results from data processing using *assessment of good manufacturing practice* (GMP).

Good Manufacturing Practice (GMP) Assessment Results

No	Aspect Name	Conformity Value (%)	Deviation Value (%)	Information
1	**Location and Environment**	**59%**	**41%**	Not enough
	a. Location	58%	42%	Not enough
	b. Environment	63%	37%	Enough
2	**Building**	**52%**	**48%**	Not enough
	a. Design and Layout of Space	51%	49%	Not enough
	b. Floor	51%	49%	Not enough
	c. Walls	52%	48%	Not enough
	d. Roof	57%	43%	Not enough
	e. Ceiling	53%	47%	Not enough
	f. Door	49%	51%	Not enough
	g. Window	58%	42%	Not enough
	h. Explanation	53%	47%	Not enough
	i . Ventilation	52%	48%	Not enough
3	**Facility Sanitation**	**53%**	**47%**	Not enough
	a. Water Supply Facilities	64%	36%	Enough
	b. Disposal and Waste Facilities	54%	46%	Not enough
	c. Toilet	54%	46%	Not enough
	d. Hand Washing Facilities	60%	40%	Enough

	e. Hygiene Facilities Employee	37%	63%	Very less
4	**Equipment Production**	**53%**	**47%**	Not enough
	a. Equipment	64%	36%	Enough
	b. Equipment Layout	50%	50%	Not enough
	c. Supervision and Monitoring	41%	59%	Not enough
5	**Material**	**68%**	**32%**	Enough
	a. Raw materials	68%	32%	Enough
	b. Water	67%	33%	Enough
6	**Processing Process**	**57%**	**43%**	Not enough
7	**Product end**	**58%**	**42%**	Not enough
8	**Laboratory**	**27%**	**73%**	Very less
9	**Employee**	**55%**	**45%**	Not enough
10	**Containers and Packaging**	**59%**	**41%**	Not enough
11	**Label**	**32%**	**68%**	Very less
12	**Storage**	**51%**	**49%**	Not enough
	a. Raw Material Storage Area	50%	50%	Not enough
	b. Storage Area Final Product	55%	45%	Not enough
13	**Maintenance**	**55%**	**45%**	Not enough
	Total	**54%**	**46%**	Not enough
	Severity Level			Very less

Figure 1 GMP Conformity and Deviation Values

After done activity analysis to mark conformity and deviations that exist in the image the results obtained from the Pareto diagram shows from to three twelve aspect *Good Manufacturing Practice* (GMP) values deviation highest namely in aspect 8 , namely laboratory by 73% next followed by aspect 11 , namely the label , at 68%, while the value conformity highest in aspect 5 , namely material by 68% next followed by aspect 1 , namely environment by 59%. The deviation value in the aspect laboratory tall due to the production process Tempeh produced by UKM Tempe Sromo No Once done activity checking quality in the laboratory , while mark deviation in the highest label aspect second due to No there is a label on the product UKM Sromo tempeh only wrapped up with plastic clear normal .

Stages furthermore after know mark from every aspects and percentages deviation *Good Manufacturing Practice* (GMP) at Tempe Sromo UKM owned by Mr. Muizzi is formulate draft repair with steps method *Model Based and Integrated Process Improvement* (MIPI). In the formulation draft repair from every aspect Incoming *Good Manufacturing Practice* (GMP). to in priority use a number of *tools* in method *Model Based and Integrated Process Improvement* (MIPI)(Arfiyanto , 2008). *Tools* in method *Model Based and Integrated Process Improvement* (MIPI) which will used in the process of taking decision in the process of related repairs with improvement quality product use approach *Good Manufacturing Practice* (GMP) ie *force field analysis*, *pareto* analysis , IDEF0, analysis because result , *flowchart* process , value added analysis , benchmarking , brainstorming, plan implementation , and *matrix process* improvement. Stages in method *Model Based and Integrated Process Improvement* (MIPI) exists seven that is identify need business , identifying business processes beginning , doing process analysis , designing business processes proposal , business process implementation , process assessment and methodology proposal , review of proposal process (AFD Putra, nd).

5. Conclusion

Based on research that has been done done by the author so can concluded condition environment Work existing based on the results observation Still Far from standard *Good Manufacturing Practice* (GMP), from results observations made by researchers from the 13 aspects carried out average value observation - per aspect Still enter criteria less and value implementation overall implementation *Good Manufacturing Practice* (GMP) at Tempe Sromo Timur UKM is included “VERY LESS” criteria . In the results assessment aspect *Good Manufacturing Practice* (GMP) at Tempe Sromo UKM owned by Mr. Muizzi in a way overall total value of overall GMP implementation respondents obtained of 8145 points or an average of 247 points for each respondent , while percentage mark deviation by 46% and the value conformity by 54% in the *Good Manufacturing Practice* (GMP) aspect at the Tempe Sromo Timur UKM owned by Mr. Muizzi , which means Still not enough fulfil criteria *Good Manufacturing Practice* (GMP). Evaluation obtained from *Good Manufacturing Practice* (GMP) *assessment* data processing , level severity of application *Good Manufacturing Practice* (GMP) at Tempe Sromo UKM owned by Mr. Muizzi that is of 247 points which means is at the classification level ((nx 2)+1) to .d (nx3) namely enter very lacking criteria meet . From the assessment to UKM environment based on aspect *Good Manufacturing Practice* (GMP) then design draft proposal improvements that can be made

done that is testing laboratory on materials raw materials and products So , the design re- layout of UKM, design repeat design building , and design *Standard Operational Procedure* (SOP) on several aspects .

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