International Economics and Business Conference (IECON)
E-ISSN: 3089-2066 | Vol. 3, No. 1, 2025 | pp. 821–831

The Influence of Raw Material Quality and Production Process on Product Quality in Melinjo Chips MSMEs in Pucangan Village, Ambal District, Kebumen Regency

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ARTICLE INFO

Article history:
Received
May 2025

Accepted
July 2025

Keywords
Raw Material Quality, Production Peocess, Product Quality, MSMEs

A B S T R A C T

The purpose of this research is to investigate how the quality of raw materials and the production process affect the final product quality of melinjo chips produced by MSMEs in Pucangan Village, Ambal District, Kebumen Regency. MSMEs are very important for the Indonesian economy, especially in terms of reducing unemployment and creating job opportunities. However, with the increasing business competition, entrepreneurs must become more competitive, which includes improving the quality of their products. This study uses a survey approach and is quantitative in nature. The research sample, consisting of 90 respondents, was selected using purposive sampling, and the population consists of melinjo chip craftsmen in Pucangan Village. Using SPSS software, data were collected through questionnaires and analyzed using multiple linear regression. The findings indicate that product quality is positively and significantly influenced by production procedures and raw material quality, both partially and jointly. These results indicate that improving the quality of raw materials and streamlining production procedures may be important tactics for enhancing the competitiveness of MSME products.

1. Introduction

MSMEs, or micro, small, and medium-sized businesses, are crucial to a nation's economic development. Micro, Small, and Medium-Sized Enterprises (MSMEs) are important to Indonesia's economy, particularly in terms of job creation and unemployment reduction. With the presence of MSMEs, opportunities are created for the community to run businesses and increase their income. However, MSMEs in Indonesia currently face various challenges, especially with the increasing number of new businesses emerging, resulting in tighter competition. In this situation, business actors need to implement various strategies to remain competitive, one of which is prioritizing good product quality.

By focusing on two crucial elements—raw materials and the production process—the corporation may create a high-quality product. The business can reduce product damage and guarantee that the output satisfies expectations if the raw materials and production process are closely monitored. With the presence of high-quality raw materials and free from defects, it will also provide good product quality.[1] Improving the quality of raw materials and manufacturing is essential to achieving good outcomes that meet the set expectations and obtaining a product that meets the required quality requirements. The quality of the finished product is greatly influenced

by the use of an efficient production process and the selection of premium raw materials. Product quality can be defined as a benchmark that determines how good or bad a product is, based on various aspects such as reliability, durability, ease of use, and the need for repairs.

1.1 Background

In a company, raw materials are the main and very important factor for an industry in carrying out its production activities. Raw materials are also all the materials used in the company for processing, which, after undergoing several production processes, are expected to become finished goods[2]. The success of a company in producing a quality product depends on the company's efforts in selecting good raw materials so that it can produce a product that meets the established standards. In addition to raw materials, creating a quality product also depends on a good and precise production process. Planning, raw material selection, processing, testing, packaging, and final product distribution are some of the steps in this process. The production process needs to be well-prepared before the production activities take place, because the quality of the production system greatly influences the results obtained, whether the produced products are of good quality or not.

As time goes by, the development of MSMEs will become increasingly rapid. With the high demand from consumers for a product, business operators are required to continue providing products that have good quality and standards. As for the MSMEs in Pucangan Village, Ambal District, Kebumen Regency, according to data available on the official Pucangan Village website in 2025, there are 139 MSME actors, including 5 in the fashion sector, 129 in the food sector which also includes 90 emping melinjo craftsmen, and 3 in the agribusiness sector (attached). Based on the information obtained by the researcher through an interview with one of the Emping Melinjo entrepreneurs in Pucangan village, it was mentioned that they often experience quality issues with their products, such as unpleasant taste, lack of durability, uneven thickness, and easy breakage.

The quality of the raw materials and the production process are two additional elements that affect the issues that entrepreneurs frequently face. The melinjo fruit frequently sustains damage from the raw components that are purchased from vendors. This can occur because suppliers do not send the melinjo fruit immediately after harvest, causing the quality of the melinjo fruit to deteriorate as it becomes too dry and the inner part of the fruit is no longer good. Additionally, in the production process, the outer skin of the melinjo fruit is peeled off and then roasted until cooked, ensuring the inner skin is perfectly dry before being peeled again for pounding. However, there are often issues when employees or business operators do not carry out the roasting process properly, resulting in suboptimal grinding. This can cause the quality of the produced emping melinjo to not meet the desired standards. This problem suggests that improving the quality of emping melinjo goods requires careful consideration of the skills and raw material quality used in the production process.

1.2 Problem Statement

In order to be more focused and particular on the research factors, this study is being undertaken in light of the concerns. The following is the phrasing of the problem in this study: Does the quality of the raw materials affect the product's quality? Does the quality of the product improve as a result of the production process?

1.3 Objectives and Scope

The purpose of this research, which is based on the background and problem formulation, is to use a quantitative approach to ascertain how production processes and raw material quality affect product quality at Melinjo emping MSMEs in Pucangan Village, Ambal District, Kebumen Regency, Central Java Province.

2. Literature Review

2.1 Related Work

Numerous studies have been carried out to support production management theory and practice by examining the impact of production procedures and raw material quality on product quality. Rizki et al. (2023) and Lestari & Ningrum (2024) have two pertinent studies.

Rizki et al. (2023) conducted research on the rattan craft industry in Pekanbaru and found that the production process had a greater influence (57.4%) on product quality compared to the quality of raw materials (19.9%). This indicates that in the context of the craft industry, a standardized and efficient process is more dominant in determining the final product quality.[3]

Lestari et al. (2024) investigated the influence of raw material quality and production process on the quality of tobacco products at KOPA Tarutama Nusantara Jember. The results show that both variables have a positive and significant effect, with the production process remaining the dominant factor. An R-squared value of 52.0% indicates that more than half of the variation in product quality can be explained by these two variables. This finding underscores the importance of managing the production process ncluding scheduling, machine maintenance, and performance evaluation as key to producing quality tobacco products.[4]

Both studies confirm that product quality is simultaneously influenced by the quality of raw materials and the effectiveness of the production process. However, in the context of large industries or modern cooperatives, the production process tends to have a greater contribution.

2.2 Research Gap

Previous studies, such as those conducted by Rizki and Wahyu Indah Lestari, generally focused on large industries like crafts and agribusiness cooperatives. However, this research focuses on traditional melinjo emping MSMEs, which have unique characteristics such as manual production, seasonal raw materials, and labor limitations. Additionally, the results of this study indicate that the quality of raw materials has a more dominant influence on product quality, which differs from previous studies that identified the production process as the primary factor. This suggests that in the context of small businesses based on local food, the quality of raw materials plays a more important role. This research also fills a gap in quantitative studies on the traditional food MSME sector, which has not received much attention in the literature until now.

3. Methodology

The survey approach was employed in this study to gather data by giving respondents statements. Because the population and sample will be studied, data will be collected using research equipment, and data analysis will be statistically quantitative in character with the goal of verifying the hypothesis, this study employs a quantitative method.[9]

3.1 Data Collection

This study's foundational data came directly from the source. Primary data is information that the data collector has gathered straight from the source.[7] Primary data was obtained directly through questionnaires, which is a data collection technique conducted by providing written statements to 90 respondents, the Emping Melinjo craftsmen in Pucangan village. The sampling technique used is total sampling, meaning all relevant members of the population will be studied without any random selection. Because in this study, the entire population consists of entrepreneurs or producers of Emping Melinjo.

3.2 Analysis Techniques

1. Multiple Linear Regression Analysis

   This study examined data using SPSS 29.0 for Windows software and the multiple linear regression analysis approach. To determine whether there is a functional

relationship between two or more independent variables (X) and one dependent variable (Y), multiple linear regression analysis is utilized to predict the impact of two or more predictor variables (independent variables) on one criterion variable (dependent variable) (Ghozali, 2021:8).[10] This analysis is used to test whether there is an influence of Raw Material Quality and Production Process on Product Quality. To see the relationship between variables, the following formula is used:

$$\mathbf{Y = a + b1\ X1 + b2\ X2\ + e}$$

2. Partial Significance Test

   In essence, the purpose of the partial significance test is to demonstrate the relative contribution of each independent variable to the explanation of the dependent variable. According to the partial significance test, there is a significant effect between the independent and dependent variables if the p-value is less than α (0.05), whereas there is no significant influence if the p-value is more than α (0.05). Furthermore, the influence on the dependent variable is positive if the regression coefficient is positive, and negative if it is negative (Ghozali, 2021:148-149). [10]

3.3 Validation

The researcher performed validity and reliability tests on the questionnaires used in this study to guarantee the dependability of the data gathered and the correctness of the research findings. The validity test was conducted by measuring the relationship between items using Pearson Correlation, and all items were declared valid because their correlation values were above 0.3. The Cronbach's Alpha value was used to do the reliability test, and the findings indicated that all variables had values higher than 0.7, indicating that the research tool is highly dependable and consistent in assessing the data that was gathered.

4. Results and Discussion

Validity Test

The variables of manufacturing process (X2), product quality (Y), and raw material quality (X1) were all subjected to validity testing.

Table 1
Validity Test Results

Variable	Item	r-count	r-table
Raw Material Quality (X1)	X1.1	0,687	0,3
	X1.2	0,762	
	X1.3	0,619	
	X1.4	0,689	
	X1.5	0,725	
Variable	**Item**	**r-count**	**r-table**
Production Process (X2)	X2.1	0,642	0,3
	X2.2	0,769	
	X2.3	0,711	
	X2.4	0,722	
	X2.5	0,753	
Variable	**Item**	**r-count**	**r-table**
Product Quaity (Y)	Y1	0,827	0,3
	Y2	0,712	
	Y3	0,575	
	Y4	0,646	
	Y5	0,433	
	Y6	0,767	

According to the findings of the validity test, every indicator for the quality of the raw materials (X1), the manufacturing process (X2), and the final product (Y) had a positive correlation coefficient over 0.3, proving the validity of every statement indicator.

Reliability Test

The purpose of the reliability test was to gauge how consistently the respondents' responses were given. The dependability of the following factors was examined in this study: product quality (Y), production process (X2), and raw material quality (X1).

Table 2
Reliability Test Results

Variable	Cronbach's Alpha	Information
Raw Material Quality (X1)	0,731	Reliable
Production Process (X2)	0,720	Reliable
Product Quality (Y)	0,745	Reliable

Source : Processed Primary Data (2025)

The reliability of each statement item is indicated by the Cronbach's Alpha value of each variable in Table 2, which is greater than 0.7. The production process and the quality of the raw materials have a positive and considerable impact on the quality of melinjo chip products. Nonetheless, raw material quality has a stronger impact than the production process, as indicated by the fact that its significance index is higher.

Multiple Linear Regression Analysis

The multiple linear regression model involves more than one variable. The results from the 90 respondents are as follows:

Tabel 3 Coefficients

Model		Unstandardized B	Standardized Coefficienst Beta	t	Sig.
1	(Constanta)	13,616		5,800	<,001
	Kualitas Bahan Baku (X1)	0,399	0,368	3,860	<,001
	Proses Produksi (X2)	0,241	0,224	2,243	0,027

The multiple linear regression equation may be constructed as follows using the data in Table 3:
Y = 13.616 + 0.386(X1) + 0.224(X2) + e
Several things may be studied from the following equation: Product Quality (Y), with X1 and X2 = 0, is rated at 13.616 when raw material quality and manufacturing process effect are absent. The expected product quality score rises as follows if each responder raises their evaluation of the manufacturing process and raw material quality by one point (X1 and X2).:
Y = 13.616 + 0.386(1) + 0.224(1) + e
Y = 14.226
The projected rise in product quality (Y) that corresponds to an increase in respondent ratings for each of the two variables is shown by the regression coefficients of 0.224 for the manufacturing process and 0.386 for the raw material quality.
This multiple linear regression equation (Y = 13.616 + 0.386(X1) + 0.224(X2) + e) has been shown to be valid and relevant for estimating product quality that is impacted by the quality of the raw materials (X1) and the production process (X2).

4.1 Key Findings

Partial Testing

If t count > t table, the Alternative Hypothesis (Ha) is adopted. The following are the outcomes of the SPSS computations, which are shown in Table 3:

The Alternative Hypothesis (Ha) is accepted as the test results showed a t count value of 3.860, which is more than the t table value of 1.987. In the meanwhile, the Alternative Hypothesis (Ha) is significant as the significance value of 0.01 is smaller than 0.05. Therefore, it can be said that the quality of the raw materials has a big impact on the product's quality. The Alternative Hypothesis (Ha) is accepted as the t-value of 2.243 in the test results is higher than the t-table value of 1.987. Meanwhile, since the significance value of 0 is less than 0.05, indicating that the production process influences the product's quality, the Alternative Hypothesis (Ha) is significant and accepted.

4.2 Interpretation of Results

The Influence of Raw Material Quality on Product Quality

The results of the multiple linear regression analysis show that product quality has a coefficient of 0.386 and a significance value of 0.001 (0 < 0.05). These results indicate that the hypothesis that raw material quality partially affects product quality is accepted. In the UMKM Emping Melinjo in Pucangan village, it was found that business operators face challenges with raw materials arriving in poor condition, such as melinjo fruit that is too dry because it was delivered late after being harvested. This causes the resulting emping to be suboptimal, making the melinjo chips less tasty and less durable. Poor quality raw materials cannot be compensated for by just a good production process. Conversely, fresh and high-quality raw materials will produce clean,

tasty, and long-lasting melinjo chips. Therefore, MSME actors need to be more selective in choosing raw materials and should establish partnerships with reliable suppliers to consistently maintain quality, in order to enhance the competitiveness of their products in the market. From the explanation above, in accordance with the research objectives, there is an influence of raw material quality on product quality.

The Influence of the Production Process on Product Quality

The results of the multiple linear regression analysis show that the production process has a positive and significant effect on product quality, with a coefficient of 0.224 and a significance value of 0.001 ($p < 0.05$). This means that the hypothesis that the production process has a partial effect on product quality is accepted. The better the production process carried out by the Emping Melinjo MSME actors, the higher the quality of the resulting product. The production process in this MSME includes peeling, frying, pounding, drying, and packaging. However, from the interview results, it was found that several processes, especially during the frying, are often not done meticulously by the elderly employees, causing the melinjo fruit to not cook evenly. As a result, the produced emping is uneven, some are too thick and some are thin, causing some emping to be easily crushed and less visually appealing. This shows that the production process greatly determines the final product, even more so than the raw materials used. Therefore, MSMEs need to pay more attention to the consistent implementation of the production process, such as ensuring trained workers, usable equipment, and following clear operational standards. The improvement of the production process not only maintains product quality but also enhances the competitiveness of MSMEs amidst tight market competition. From the explanation above, in accordance with the research objectives, it can be concluded that there is an influence of the production process on product quality..

5. Discussion

5.1 Comparison with Prior Research

In the first hypothesis, it was found that raw material quality has a positive and significant effect on product quality, meaning that any change in product quality, whether it becomes better or decreases in quality, will affect the product quality. The findings of this study corroborate those of Herawati and Mulyani (2016)11, Erdi and Haryanti (2023)13, Pasaribu and Alhazami (2022)1, Hilary and Wibowo (2021)12, and Rizki et al. (2023)8. Its conclusions showed that the quality of the end product is positively and considerably impacted by the quality of the raw materials. Every step of the manufacturing process will have an impact on the final product, according to the second hypothesis, which found that the production process has a positive and substantial effect on product quality. If the production process is getting better and more dependable, the end product will be of greater quality. The findings of this investigation corroborate those of other studies by Edri and Haryanti (2023), Pasaribu and Alhazami (2023), Herawati and Mulyani (2016), Hilary and Wibowo (2021), and Rizki et al. (2023).

5.2 Limitations

The limitations in this study are more focused and specific to the research variables, namely, the object of this research is MSME Emping Melinjo, the subject of this research is the Emping Melinjo business actors in Pucangan Village, this research is limited to the variables Product Quality (Y), Raw Material Quality (X1), and Production Process (X2), and the location of this research is in Pucangan Village, Ambal District, Kebumen Regency. Acknowledge any limitations that may have affected your research.

5.3 Future Research

For future researchers, it is expected that they can reach other aspects related to Operational Management, and also can find other variables that can complement the shortcomings of previous studies. Examples of other variables are labor quality, production cost efficiency, customer satisfaction, etc. The aim is to provide a difference from the results of the research so that it will broaden the reference of other research sources.

6. Conclusion

The following findings were drawn from a study that used multiple linear regression analysis to examine 90 Melinjo Chips MSME actors in Pucangan Village, Ambal District, Kebumen Regency:

1. Product quality (Y) is positively and significantly impacted by raw material quality (X1). The test findings indicate a significance value of 0.001 ($p < 0.05$) and a regression coefficient value of 0.386. This implies that the quality of melinjo chips produced increases with the quality of the raw materials utilized. It has been demonstrated that issues with raw materials that are too dry, immature, or too young, as well as those that are not fresh, lower the quality of the finished product in terms of flavor, longevity, and appearance.
2. The quality of the product (Y) is positively and significantly impacted by the production process (X2). Statistical testing yielded a significance value of 0.027 ($p < 0.05$) and a regression coefficient of 0.224. This demonstrates that the quality of the items produced increases with the effectiveness and consistency of the production process. Melinjo chips are inconsistent and less appealing as a result of processes like uneven roasting or incorrect pounding.

Therefore, it can be said that MSME actors need to focus on both the quality of the raw materials utilized and the manufacturing process that is carried out consistently and in accordance with standards in order to manufacture high-quality melinjo chips goods.

7. Recommendation

Suggestions for this research are:

a) For MSME Actors

It is recommended for Emping Melinjo entrepreneurs to be more selective in choosing raw materials, such as ensuring that the melinjo fruit used is still fresh and suitable for processing. Entrepreneurs should also establish partnerships with reliable suppliers to maintain the consistency of raw material quality.

b) Improvement of the Production Process

SMEs need to implement standard operating procedures (SOP) at every stage of production. Training for workers, maintenance of production equipment, and regular quality control can help maintain the final quality of emping.

Apendix

RESEARCH QUESTIONNAIRE

THE INFLUENCE OF RAW MATERIAL QUALITY AND PRODUCTION PROCESS ON PRODUCT QUALITY IN MELINJO CHIPS MSMEs IN PUCANGAN VILLAGE, AMBAL DISTRICT, KEBUMEN REGENCY

A. PART ONE : RESPONDENT IDENTITY

Name of Respondent :

Gender :

Age :

Monthly Production Capacity (kg) :

B. STATEMENT DETAILS : INSTRUCTION FOR COMPLETION

Below are various statements regarding the research variables. Please provide your honest answers by placing a check mark (√) in the appropriate column.

SA	Strongly Agree	5
A	Agree	4
SD	Somewhat Disagree	3
D	Disagree	2
SD	Strongly Disagree	1

1. Raw Material Quality (X1)

Number	Statement	1 SD	2 D	3 SD	4 A	5 SA
1	The Melinjo chips raw materials used have good quality.					
2	The price of melinjo fruit is in line with the selling price of Melinjo Chips.					
3	Raw materials must be processed immediately after delivery to prevent damage.					
4	There is never a shortage of Melinjo Chips raw materials for production.					
5	The quality of raw materials used is very important to produce high-quality final products.					

2. Production Process (X2)

Number	Statement	1 SD	2 D	3 SD	4 A	5 SA
1	Workers must understand the production standards of Melinjo Chips to produce appropriate quality.					
2	The tools used facilitate the production process.					
3	Damage to the tools used can delay the production process.					
4	Melinjo fruits must be sorted before production to yield quality products.					
5	The production process from raw materials to finished products must meet the targeted time.					

3. Product Quality (Y)

Number	Statement	1 SD	2 D	3 SD	4 A	5 SA
1	The Melinjo Chips produced must meet product standards.					
2	The texture of Melinjo Chips produced matches consumer preferences.					
3	The packaging of Melinjo Chips keeps the product safe from damage.					
4	Melinjo Chips have a high shelf life.					
5	The optimal appearance of Melinjo Chips adds to consumer appeal.					
6	The quality of Melinjo Chips is consistently maintained from the start of the business until now.					

Acknowledgement

The author expresses the deepest gratitude to those who have sincerely and wholeheartedly contributed their time and effort, whether in the form of interviews, filling out questionnaires, or other

activities towards the completion of this writing: Mrs. Wargiati (wife of the village official of Pucangan) who assisted in sample collection, Mrs. Susi (Village Official of Puangan) who helped complete the respondent data, Mrs. Susi (UMKM Emping Melinjo entrepreneur) who provided information about her business, and Mrs. Wijayanti (Supervisor 1) who has given much support, time, and knowledge, and Mr. Dedi (Supervisor 2) who played a role in the completion of this research. Nur Fiana (roommate, childhood friend, and fellow expatriate) who has always been there and helped each other in completing this research, Yudi Maulana (constant motivator), and both parents who always pray for smooth success.

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