

QUALITY MANAGEMENT: CASE STUDY AT GUDEG PEJOMPONGAN RESTAURANT USING TQM TOOLS

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ABSTRACT

In production, quality management is used to create items that meet quality requirements, avoid product reprocessing, etc. One of the quality management systems that Rumah Makan Gudeg Pejompongan does not have in place is statistical quality control. The purpose of this study is to determine the process of making the final product, namely gudeg, knowing the types of failures that often occur in products produced in one month, knowing the order of the types of product failures that occur most often in one month, and knowing the causes of failure of gudeg products produced in restaurants. Four of the first seven TQM tools—flowcharts, check sheets, Pareto charts, cause and effect diagrams, or fishbone diagrams—are used in this study to assist businesses in implementing quality management. The author employed a descriptive research methodology, gathering data directly from field sources (field research). Cross-sectional data collection is used in this study to gather information at a single point in time. Interviews, observations, and literature reviews are used to collect data, while statistical tools are used for data analysis on Total Quality Management. The findings indicate that the Gudeg Pejompongan restaurant's production process consists of 19 steps to produce the finished product. Failures in the production process come in different forms, and the quantity of production failures is evident throughout the night and morning shifts. Out of 84 units of product failures, the categories of failures and their corresponding order of largest to smallest are as follows: Failure C (burnt jackfruit) accounts for 33%, failure D (hard jackfruit) for 29%, failure B (crushed krecek crackers) for 20%, and failure A (egg filling out) for 18%. Furthermore, the findings indicated that processes and human resources are the main reasons behind product failures at the Gudeg Pejompongan restaurant.

Keywords: TQM, Flowchart, Check Sheet, Pareto Chart, Fishbone Diagram.

ABSTRAK

Dalam produksi, manajemen mutu digunakan untuk menghasilkan produk yang memenuhi persyaratan mutu, menghindari proses ulang produk, dan sebagainya. Salah satu sistem manajemen mutu yang belum dimiliki Rumah Makan Gudeg Pejompongan adalah pengendalian mutu statistik. Tujuan dari penelitian ini adalah untuk mengetahui proses pembuatan produk akhir yaitu gudeg, mengetahui jenis kegagalan yang sering terjadi pada produk yang diproduksi dalam satu bulan, mengetahui urutan jenis kegagalan produk yang paling sering terjadi dalam satu bulan, dan mengetahui penyebab kegagalan produk gudeg yang diproduksi di rumah makan. Empat dari tujuh alat TQM pertama—diagram alir, lembar pemeriksaan, diagram Pareto, diagram sebab akibat, atau diagram tulang ikan—digunakan dalam penelitian ini untuk membantu bisnis dalam menerapkan manajemen mutu. Penulis menggunakan metodologi penelitian deskriptif, yaitu pengumpulan data langsung dari sumber lapangan (penelitian lapangan). Pengumpulan data cross-sectional digunakan dalam penelitian ini untuk mengumpulkan informasi pada satu titik waktu. Wawancara, observasi, dan tinjauan pustaka digunakan untuk mengumpulkan data, sedangkan alat statistik digunakan untuk analisis data pada Total Quality Management. Hasil penelitian menunjukkan bahwa proses produksi Rumah Makan Gudeg Pejompongan terdiri dari 19 tahapan untuk

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menghasilkan produk akhir. Kegagalan dalam proses produksi muncul dalam berbagai bentuk, dan kuantitas kegagalan produksi terlihat jelas sepanjang shift malam dan pagi. Dari 84 unit kegagalan produk, kategori kegagalan dan urutannya dari yang terbesar hingga yang terkecil adalah sebagai berikut: Kegagalan C (nangka gosong) mencapai 33%, kegagalan D (nangka keras) mencapai 29%, kegagalan B (kerupuk krecek remuk) mencapai 20%, dan kegagalan A (telur isi pecah) mencapai 18%. Lebih lanjut, hasil penelitian menunjukkan bahwa proses dan sumber daya manusia merupakan penyebab utama kegagalan produk di Rumah Makan Gudeg Pejompongan.

Kata kunci: TQM, Diagram Alir, Lembar Periksa, Diagram Pareto, Diagram Tulang Ikan.

1. INTRODUCTION

The Gudeg Pejompongan restaurant is a trading business-type firm that operates in the Yogyakarta Special Region's home cooking sector. Its major product is gudeg, which is made up of jackfruit, krecek, eggs, sambal, and tofu bacem. The Gudeg Pejompongan restaurant offers gudeg-friendly accompaniments such as ati ampela, buntil, opor chicken, and more. With an average percentage of failed goods or items that need to be reworked of 7.63% above the maximum limit of the percentage of failed production created, this restaurant is having trouble creating inconsistent failed products during a year. A corporation is considered to have high production quality if the proportion of failed items is no more than 6%, as per the maximum limit of production failure percentage set by Gudeg Pejompongan restaurant. The firm produces a lot of unsuccessful items as a result of inadequate quality control and oversight throughout the manufacturing process. Businesses should be concerned with restaurant quality since it is the most crucial feature in ensuring that items are produced in accordance with the company's criteria or standards, which can satisfy customers. "Quality refers to a product or service's ability to consistently meet or exceed customer requirements or expectations," states Stevenson (2021: 379). Businesses can use Total Quality Management (TQM) tools to implement quality management. To implement quality management, Total Quality Management (TQM) uses seven tools: flowcharts, histograms, Pareto charts, scatter diagrams, cause-and-effect diagrams, check sheets, and statistical process control. Due to the issues at the Gudeg Pejompongan restaurant, quality control must be implemented using Total Quality Management (TQM) tools to ensure that the company's output meets quality standards, that customers are satisfied with the restaurant, that the company's reputation is enhanced, that customers are devoted to the business, and that customers can tell others about their experiences. The purpose of this research is to assist businesses in implementing Total Quality Management (TQM) by utilizing seven instruments.

2. METHOD AND DATA

Mixed-methods research is employed, meaning that both quantitative and qualitative data will be used. Mixed-methods research is defined as research that focuses on data collection, data analysis, and the combination of quantitative and qualitative data in a single study or is utilized in conjunction with each other in a series of studies (Sekaran & Bougie, 2016: 106). This study uses a descriptive methodology that does not modify the real world to match fictitious circumstances, instead concentrating on objective details of a topic, circumstance, or occurrence in the field. This method, as described by Sekaran and Bougie (2016:43), entails gathering data directly from the field using Total Quality Management (TQM) tools in order to provide a thorough understanding of the quality management process at Gudeg Pejompongan Restaurant. It is appropriate for both quantitative and qualitative studies. In order to fully comprehend the current situation without the researcher's bias, field research is carried out through observation and engagement. The following methods were used to acquire data:

i. Interview

When the information needed for data collection is known from the outset, structured interviews are carried out (Sekaran and Bougie, 2016). Structured interviews aim to obtain comprehensive information about the general description of the problems faced, standards of the product manufacturing process, and product data that do not meet the quality standards of the Gudeg Pejompongan restaurant in Central Jakarta. They will also facilitate the asking of the same or similar questions by different people, allowing for data comparisons based on different people's answers.

ii. Observation

According to Sekaran and Bougie (2016), observation is the process of seeing, noting, evaluating, and offering a theoretical interpretation of occurrences that take place. In order to gain a better understanding of the actual products produced at Gudeg Pejompongan restaurants, observations were conducted at 51 of these establishments. Specifically, data on the types of product failures that frequently occur, the order in which these failures frequently occur, and the causes of product failures produced by Gudeg Pejompongan restaurants for the period of October 2023 were collected.

iii. Literature Review

The act of progressively or methodically identifying publications relating to issues and documenting other people's work is known as a literature review (Sekaran and Bougie, 2016). The goal of doing a literature review is to gather data for study. Theories and data from books, scientific publications, the internet, and earlier research were used to gather information for this study. The data gathered has to do with quality management and this study.

The author uses statistical tools in Total Quality Management (Seven Tools) and the Statistical Quality Control (SQC) method. To use statistical tools, the following steps are taken:

i. Creating a Flowchart

To identify the product manufacturing process at Gudeg Pejompongan restaurant, flowcharts, one of the statistical tools in Total Quality Management (Seven Tools), are used to show the steps in a final product production process.

ii. Creating Check Sheet

Check sheets, one of the statistical tools used in Total Quality Management (Seven Tools), are used to gather and methodically arrange data on corporate events and the kinds of product failures that frequently happen in Gudeg Pejompongan restaurants.

iii. Creating Pareto Charts

Pareto charts, one of the statistical methods used in Total Quality Management (seven methods), are used to determine the most common issues or product failure categories in the Gudeg Pejompongan restaurant. This tool displays an occurrence bar graph of the issues. Issues can be divided into many categories, including defect A (size flaw) that adapts to requirements.

iv. Creating Cause-and-Effect Diagrams (Fishbone Diagrams)

The process of determining the root cause of a problem, non-conformity, and examining the elements that lead to the product's noncompliance with the company's quality standards is known as a cause-and-effect diagram (fishbone diagram).

v. Recommendation

Based on data from the Total Quality Management (Seven Tools) statistical instrument, the author offers advice in its preparation.

3. DISCUSSION

i. Final Product Manufacturing Process at Rumah Makan Gudeg Pejompongan

The production process at Gudeg Pejompongan restaurant has nineteen stages in producing the final product. The Final Product Manufacturing Process at Gudeg Pejompongan restaurant is as follows:

- Cut the young jackfruit and boil the jackfruit pieces in a pan with old coconut water
- Put the spices, coconut milk, bay leaves, lime leaves, galangal, and brown sugar in a wok
- Cook over medium heat
- Jackfruit color is brown and seasoning is absorbed
- Straining the jackfruit soup
- Serve on the stove
- Cut the chicken and separate the duck egg with the shell
- Cook the chicken pieces, duck egg, water, seasoning, and appendages in a wok
- Checking the Condition of Chicken and Duck Eggs
- Mix in the jackfruit sauce and cook over medium heat
- Saute chili peppers, bay leaves, and spices in a wok then add coconut milk
- Cook over high heat
- Seasoning is cooked until completely boiled
- Combine crackers and cayenne pepper in a wok
- Cook over medium heat
- Krecek cracker gravy thickens
- Checking the quality of products or dishes
- Putting in the display case
- Serving to consumers

ii. Types of Failures that Often Occur in Products Produced by Rumah Makan Gudeg Pejompongan

Based on observations that have been made of the Gudeg Pejompongan restaurant, it is found that product failures often occur:

- **Egg Filling Out:** This category includes products that fail, such as cracked, damaged, or out-of-specification egg contents.
- **Cracked Crackers:** This category includes failed products, such as krecek crackers that have a soft shape, watery texture, or faded color.
- **Burnt Jackfruit:** This category includes products that fail due to the production process, with issues such as dark color, burnt smell, and dry texture.
- **Hard Jackfruit:** This category includes failed products with issues such as the jackfruit pieces being too large, the seed coat not being separated, and the jackfruit being too old.

Data collection on the types of failures that often occur are categorized into egg filling out (A), crushed crackers (B), burnt jackfruit (C), and, hard jackfruit (D). The order of the types of failures generated by the Gudeg Pejompongan restaurant based on the number of failures in the October production results in 2023 using a comparison that can be seen in table 1.

Table 1. Comparison of Night and Morning Shifts in October 2023 Based on Number of Failures

| Jenis Kegagalan | Malam | Pagi | Total Kegagalan (Unit) | Total Produksi (Unit) |
|-----------------|-------|------|------------------------|-----------------------|
| C | 20 | 8 | 28 | 887 |
| D | 10 | 14 | 24 | |
| B | 8 | 9 | 17 | |
| A | 9 | 6 | 15 | |
| Total | 47 | 37 | 84 | |

Out of a total output of 887 units, the table indicates that 84 units were unsuccessful products. The largest to smallest failure categories are as follows: up to 28 units of burnt jackfruit (C), 24 units of hard jackfruit (D), up to 17 units of crushed krecek crackers (B), and up to 15 units of filled eggs (A). The restaurant had a higher percentage of burnt jackfruit (C) failures during the night shift (20 units) than during the morning shift (8 units), according to the comparison of the night and morning shift data. Furthermore, comparing the night and morning shifts' data reveals that hard jackfruit (D), which can fail up to 14 units in the morning shift, is the most common type. The hard jackfruit (D) during the night shift indicates that this failure is a part of the 10-unit high failure.

iii. Ranking of the Most Frequent Types of Product Failure at Pejampongan Gudeg Restaurant

Using a pareto chart serves the purpose of providing a hierarchy of failure kinds, ranging from the greatest to the smallest, allowing one to determine the frequency of the major failures, which should be addressed first. In order to determine the order of the different types of failures, the amount of production, and the total number of failures, the pareto chart analysis starts by entering the data from table, which compares the night and morning shifts in October 2023 based on the number of failures.

Table 2. Analysis Table of All October Production in 2023

| Tabel Analisis (Semua Produksi) | | | | |
|---------------------------------|-----------------|------------------|---------------|----------------------|
| Jenis Kegagalan | Jumlah Produksi | Jumlah Kegagalan | Frekuensi (%) | Persen Kumulatif (%) |
| C | 887 | 28 | 33% | 33% |
| D | 887 | 24 | 29% | 62% |
| B | 887 | 17 | 20% | 82% |
| A | 887 | 15 | 18% | 100% |
| Total | | 84 | 100% | |

Based on the data that has been processed in the table above, then the pareto chart can be made in the following figure.

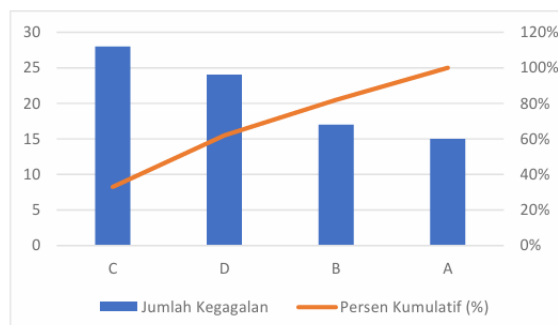


Figure 1. Pareto Chart of All October Production in 2023

The figure's Pareto chart analysis indicates that, as of October 2023, failure C (burnt jackfruit) is at 33%, failure D (hard jackfruit) is at 29%, failure B (crushed Krecek crackers) is at 20%, and failure A (eggs out) is at 18%. These are the greatest to smallest product failures and prospective issues.

iv. Causes of Failure Generated at Rumah Makan Gudeg Pejompongan Using Cause-and-Effect-Diagram (Fishbone Diagram)

To ascertain the link between issues that arise and potential reasons and elements that impact unsuccessful items or products that fall short of the Gudeg Pejompongan restaurant's quality requirements, a cause-and-effect diagram, also known as a fishbone diagram, is utilized. The following elements are taken into account by the Gudeg Pejompongan restaurant while managing quality:

- **Human Resources:** The human resource factor is very important in ensuring product quality at Gudeg Pejompongan restaurant. Human resources must have the knowledge, skills, thoroughness and discipline in cooking products. This knowledge is needed because most of the production processes in the restaurant are carried out by humans.
- **Machinery and Equipment:** Machinery and equipment that support the production process in restaurants must be in accordance with the needs of the company. The use and maintenance of machinery and equipment greatly ensures the importance of products for quality. Then, damage or errors in the use of machinery and equipment can harm the company.
- **Raw Materials:** The selection of good raw materials and qualified suppliers is important to avoid bottlenecks in the production process. Companies need to check the quality of raw materials regularly, even if the supplier is trusted, to ensure quality products.
- **Methods:** The method factor involves the procedures or stages that guide human resources in the production process. Errors in the production stage can result in product failure, and the company sets Standard Operating Procedures (SOPs) to ensure the process complies with predetermined standards.

The stuffed egg category is a failed product that often occurs at Gudeg Pejompongan restaurant such as cracked, damaged, or not according to specifications so that the contents of the egg come out. To help identify the causal factors of this type of egg filling out, the author uses the cause-and-effect-diagram (fishbone diagram) tool in the figure below.



Figure 2. Cause-and-Effect-Diagram (Fishbone Diagram) Factors Causing Egg Fill Out (A)

Based on the results of interviews and observations, it is known that the potential factors that cause eggs to be filled out are:

- Machinery and Equipment: Inappropriate temperature and non-standard timing issues in machinery and equipment can lead to stuffed eggs escaping.
- Human Resources: Not checking the raw materials and lack of focus in stirring by the labor can cause the stuffed eggs to come out.
- Raw Materials: The quality of raw materials, such as duck eggs that do not meet specifications, cracked duck eggs, incompletely cooked, or overcooked can result in stuffed eggs coming out.
- Methods: Stirring too fast, using improperly hard-boiled eggs, and improperly peeling hard-boiled eggs can cause stuffed eggs to escape in the production process.

Crumbled krecek crackers are a failed product that often occurs at Gudeg Pejomponan restaurant in the processed results of crushed krecek crackers or krecek crackers that are soft in shape, watery in texture, and off-white in color. To help identify the causal factors of this type of crumbled crackers, the authors used the cause-and-effect diagram (fishbone diagram) tool in the figure below.



Figure 3. Cause-and-Effect-Diagram (Fishbone Diagram) Factors Causing Cracked Crackers (B)

Based on interviews and observations, it is known that the potential factors that cause crushing failure are:

- Human Resources: The influencing sub-factors are temperature setting and time setting. Then, inaccurate temperature settings, using inappropriate fire can result in soft crackers and faded colors. And inaccurate timing, with too long a cooking time can also result in crushed krecek crackers.
- Methods: The influencing sub-factors are water that does not boil completely and uneven seasoning. Water that has not fully boiled when mixing krecek crackers and spices can result in soft krecek crackers. Then, uneven seasoning due to no clear measure can also cause krecek crackers to crumble with a watery texture and faded color.

The category of burnt jackfruit is the processed result of jackfruit such as dark color, burnt smell, and dry texture. To help identify the causal factors of this type of burnt jackfruit, the author uses the cause-and-effect-diagram (fishbone diagram) tool in the figure 4.



Figure 4. Cause-and-Effect-Diagram (Fishbone Diagram) Factors Causing Burnt Jackfruit (C)

Based on interviews and observations, the potential factors that cause jackfruit to burn are:

- **Human Resources:** The influencing sub-factors are less thorough supervision of combustion and less understanding of the use of machinery and equipment. Lack of thoroughness in supervising combustion can result in temperatures that exceed the set standards. Lack of understanding of the use of machinery and equipment can also result in excessive temperatures resulting in burnt jackfruit.
- **Machinery and Equipment:** The influencing sub-factors are faulty temperature settings and non-standard time settings. Damage to the machine cooking the raw materials can result in temperatures that exceed the standard, causing the jackfruit to burn. Non-standard time settings can also result in too long a production process time causing the jackfruit to burn.
- **Methods:** The influencing sub-factors are the use of too much fire and the non-absorption of seasonings. The use of too much fire can result in burning that is not in accordance with the standard resulting in burnt jackfruit. The lack of spice absorption because there is no clear measure can also cause jackfruit to burn with inappropriate color, aroma, and texture.

The hard jackfruit category is a failed product such as jackfruit pieces that are too big, jackfruit seed hulls that are not separated, and jackfruit that is too old. To help identify the causal factors of the hard jackfruit type, the author uses the cause-and-effect-diagram (fishbone diagram) tool in the figure below.

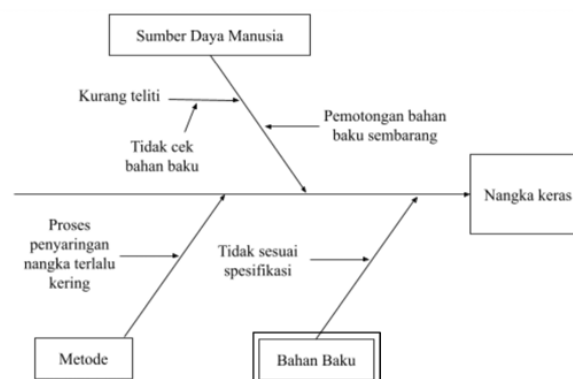


Figure 5. Cause-and-Effect-Diagram (Fishbone Diagram) Causal Factors of Hard Jackfruit (D)

Based on interviews and observations, the potential factors that cause jackfruit to become hard are:

- **Raw Materials:** The quality of raw materials that do not meet specifications, such as jackfruit that is too old and not suitable for consumption, can produce a product that is too hard into hard lumps and has a rough texture of jackfruit.
- **Human Resources:** The influencing sub-factors are the arbitrary cutting of raw materials which results in inappropriate sizes and the lack of limitations in the inspection of appropriate raw materials. Arbitrary cutting of raw materials and lack of quality inspection of raw materials can result in jackfruit that is too hard and has a rough texture.
- **Methods:** The process of filtering jackfruit that is too dry because the appropriate filtering time is not determined can result in jackfruit that is too hard and has a rough texture.

4. CONCLUSION

In October 2023, an analysis of production failures at Gudeg Pejompongan restaurant revealed that the most frequent type of failure was burnt jackfruit (C), followed by hard jackfruit (D), crumbled crackers (B), and stuffed eggs (A). In addition, the night shift has a higher number of failures compared to the morning shift. The Pareto chart shows that burnt jackfruit (C) is also the most common type of failure in both shifts, followed by hard jackfruit (D), egg filling out (A), and crushed crackers (B). Analysis of the causes of failure using cause-and-effect-diagram (fishbone diagram) identified that human resources and methods are the dominant causes of failure in the production of Gudeg Pejompongan restaurant. Based on the results of the discussion, there are several suggestions that can be given based on the largest to smallest types of failures in order and the factors that cause the types of failures produced, namely socialization during the production process by reminding the workforce continuously about standards, setting a standard in the production process in the form of drawings, preparing raw materials according to specifications before the production process, setting production process standards or Standard Operating Procedure (SOP), reminding the workforce continuously about the SOP in the production process, and rejuvenating damaged machines and regular machine maintenance.

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