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Strengthening the Production Quality System Through the Implementation of Quality Control in the Nila Tofu Factory

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ABSTRACT

Effective quality control is a key element in maintaining competitive advantage in the food industry, especially in tofu production at the Nila Tofu Factory. This study aims to analyze the implementation of quality control in improving the quality of tofu products, focusing on technical and managerial factors. The implementation of quality control methods, such as this study, which uses a qualitative approach to analyze the technical and managerial factors that hinder quality consistency at the Nila Tofu Factory, has proven effective in identifying and reducing product defects in several tofu factories. However, this study also shows that human factors, employee motivation, and suboptimal managerial systems are the main obstacles in maintaining consistent product quality. The results of the study through interviews with the owner and employees of the Nila Tofu Factory revealed a decline in product quality, especially in terms of inconsistent texture, as well as constraints on equipment and quality control that are not well structured. Proposed improvements include the procurement of new machines, routine training, providing results-based incentives, and the implementation of clear and standardized standard operating procedures (SOPs). This study suggests the importance of integration between technical and managerial systems to ensure sustainable quality control and increase the competitiveness of tofu products in the market.

Keywords: Employee Motivation, Quality Control, Six Sigma, SOP, SQC, Taguchi

INTRODUCTION

Effective quality control is a fundamental component for maintaining excellence in the production process, especially in traditional food industries such as the Nila Tofu Factory. Achieving and maintaining high product quality requires a comprehensive approach that integrates technical and human factors. One important aspect of this approach is the active involvement of employees, where their participation can build a sense of shared responsibility and commitment to quality goals. When workers are motivated and empowered, they are more likely to proactively identify potential problems and contribute to continuous improvement efforts, which in turn can reduce product defects and improve product consistency.

In addition to human factors, systematic management tools play an important role in strengthening quality control measures. One of them is Quality Control Circles (QCC), which serves as a collaborative platform where employees from various levels work together to analyze problems, develop solutions, and implement improvements. This participatory approach not only improves the efficiency of problem solving but also forms a quality-oriented organizational culture. In addition to QCC, cost analysis techniques enable factories to identify cost factors associated with quality problems, allowing targeted interventions that optimize resource utilization without compromising product standards.

In addition, integrating these tools into a structured management system promotes transparency, accountability, and continuous monitoring of quality performance. This kind of systematic management ensures that quality control is not a one-time effort, but rather an ongoing process embedded in daily operations. This holistic strategy is especially important in the traditional food industry, where local craft techniques and ingredients often present unique challenges in product standardization and consistency. By encouraging employee engagement, increasing motivation, and utilizing systematic tools such as QCC and cost analysis, companies like Nila Tofu Factory can maintain product quality, remain competitive in a dynamic market, and ensure long-term business sustainability. Ultimately, a strong quality control framework, rooted in human involvement and systematic management, is critical to the resilience and success of traditional food production companies.

Several previous studies have examined the application of quality control methods in the production

process. For example, research by (Qonita et al., 2022) conducted at UD Zahra using the Statistical Quality Control (SQC) method showed that the most common product defects were holes, flat, and non-uniform. From these failure factors, suggestions for improvement were obtained, including: material factors, selecting suppliers with good quality materials; human factors, setting aside external problems with work to be more careful in working hours, taking a break before work, not rushing, and being more careful and alert; machine factors, providing funds for machine maintenance, diligently lubricating the machines used, using automatic machines; and method factors, being more careful and consistent in the production process and setting a timer in each production process.

Another study by (Agustina, 2024) conducted at UD Tahu Bang Dahri, Bireuen Regency, used the SQC and Taguchi methods to analyze the quality control of tofu production. The results showed that factors such as boiling time, pressing, and grinding contributed significantly to product defects, and the application of the SQC and Taguchi methods could reduce the level of product defects.

Another study by (Anelia & Al-Faritsy, 2021) at the Maryanto Tofu Factory, Yogyakarta, which used the Six Sigma method, found that the product defect rate reached 13%, and the application of the Six Sigma method can improve product quality by identifying and reducing the causes of defects.

However, although various studies have applied methods such as SQC, Taguchi, and Six Sigma, there is still a gap in the implementation of adequate SQC in the traditional food industry, especially in tofu factories. SQC as a method that has long been used to monitor product quality is often hampered by lack of workforce training, inconsistent implementation, and the inability to adapt statistical tools to the dynamics of a more complex and changing production process. One of the main challenges in applying SQC in the traditional food industry is the lack of a deep understanding of how to adapt quality control techniques to

METHOD

This study uses a descriptive qualitative approach, with the aim of understanding in depth how the quality control implementation process is carried out at the Nila Tofu Factory and how it impacts product quality control. The selection of informants in this study involved several parties who have direct understanding of the production process and quality control at the Nila Tofu Factory. The main informants selected include the Production Manager, who provides insight into quality control procedures and challenges faced in maintaining product quality; Production Line Employees, who have direct experience in the production process and can provide information related to factors that affect product quality; Quality Control Supervisors, who are responsible for implementing quality control techniques such as SQC and quality data analysis; Managerial Parties, who provide perspectives on strategic decisions and resource allocation to support quality control; and Raw Material Suppliers, who provide information on the quality of raw materials used in the tofu production process.

To collect data, this study will use various methods. In-depth interviews will be conducted with informants to explore qualitative information related to quality control and the implementation of methods such as SQC, Taguchi, and Six Sigma. Direct observation on the production line will also be conducted to assess the implementation of quality control in the field. Documentation studies will analyze quality reports, machine maintenance records, and SQC analysis results to obtain relevant secondary data. A questionnaire will be used to collect quantitative data from employees regarding their perceptions of the quality control implemented. Finally, production performance data analysis will be conducted to evaluate the impact of implementing quality control methods on product defect rates and production performance. All of these methods aim to provide a comprehensive picture of quality control at the Tilapia Tofu Factory and generate recommendations to improve product quality and competitiveness in the market. Data analysis was carried out using the interactive model of (Miles & Huberman, 1984; Moleong, 2017; Sugiyono, 2019), which includes three main stages: Data Reduction, namely Filtering data from interviews, observations, and relevant documentation to focus on the main theme, then Data Presentation, namely presenting data in the form of descriptive narratives, direct quotes, and summary tables of findings for easy analysis. then Conclusion Drawing and Verification, namely Drawing meaning, patterns, and conclusions from the findings and verifying through triangulation between data sources.

RESULT AND DISCUSSION

Result

Table 1 Interview

<i>Informant</i>	<i>Main Problem</i>	<i>Response to Quality Control</i>	<i>Proposed Solution</i>
Factory Owner	Product quality decline (inconsistent texture)	Already implemented through raw materials and supervision	Overtime reward, failed product punishment, rotating holidays
Employee 1	Working stability declines, products are easily destroyed	Good raw material control, work evaluation is needed	Sanctions for undisciplined employees, routine evaluations
Employee 2	Imperfect products, defects are returned	Raw materials meet standards, but quality continues to decline	Daily evaluations, weekly bonuses, low performance sanctions
Production Employee	Manual control, broken machines, high working pressure	No written SOP, only foreman checks	Replace machines, HR training, results-based incentives

The following is a thematic table of interview results that summarizes the problems, responses, and solutions from each informant regarding the implementation of quality control at the Nila Tofu Factory. This study aims to examine the implementation of quality control in an effort to improve quality control at the Nila Tofu Factory. The results of interviews with several informants, namely the factory owner, two production employees, and one senior employee, showed a number of important findings that were grouped by theme.

Decrease in Product Quality

All informants stated that there had been a decline in the quality of tofu products in recent times. The factory owner emphasized that consumer complaints had increased, especially regarding the inconsistent texture of the tofu—some were too thin, too thick, and not dense. These complaints were considered the main indicator of the weakening of the current quality control system. The first and second employees added that the product often crumbled easily, indicating the low durability of the tofu, even though the raw materials had met the established standards.

Evaluation of Quality Control Implementation

In terms of quality control implementation, the owner claimed that the system had been implemented, especially through the selection of fresh raw materials and supervision of the production process. However, according to production employees, the implementation of quality control was still carried out manually, without written SOPs, and only based on checks from the foreman. The absence of standard procedures caused the results of the checks to be subjective and inconsistent. Employees also stated that routine training was never carried out, and the quality control process was more dependent on individual work experience.

Inhibiting Factors of Production Quality

Some inhibiting factors found include the condition of production machines that often experience leaks and have not been updated, High production target pressure, causing the work process to be rushed and quality to be neglected. The absence of compensation for overtime, causing a decrease in employee morale. And dependence on monthly salary as the only motivator, without a bonus system or performance-based incentives.

Solution Proposals by Informants

The informants also provided several suggestions to improve quality control and product quality, including From the factory owner Implementing a reward system for overtime employees, punishment for defective products, and arranging rotating holiday schedules so that employee stamina is maintained. From the first employee The need for sanctions for undisciplined employees, daily performance observations, and weekly evaluations through team meetings. From the second employee Implementation of a weekly bonus system for achieving targets and sanctions for low performance. From production employees Procurement of new machines, ongoing HR training, and provision of incentives based on production results.

Discussion

The above findings indicate that although quality control has been carried out in a basic manner, it has not been implemented systematically and standardized. This is in line with the opinion (Gaspersz, 1988;

Saputra et al., 2023) who emphasized that effective quality control requires standard procedures, consistent training, and involvement of all levels of the organization. In addition, weak employee work motivation has a direct impact on production quality. In a study by (Akbar, 2018; Brilliantisyah et al., 2024; B. Rahayu & Ruhamak, 2017; S. T. Rahayu & Ismail, 2024), it is explained that employee productivity and work quality are greatly influenced by a fair compensation and reward system and regular work skills training. Therefore, the implementation of quality control at the Nila Tofu Factory needs to be improved, not only by strengthening technical procedures, but also through managerial and psychological aspects, such as providing appreciation, routine training, and managing a balanced workload.

Based on the research the implementation of the proposed solutions to improve quality control at the Tilapia Tofu Factory includes several important steps. First, the preparation and implementation of clear Standard Operating Procedures (SOPs) are expected to reduce dependence on individual experience and improve product quality consistency. Second, investing in new production machines and maintaining existing ones will address quality issues caused by damaged or obsolete equipment, thereby improving the durability and texture of tofu. Third, implementing a performance-based compensation system, such as offering weekly bonuses and overtime awards, can increase employee motivation, which in turn has a positive impact on work and product quality. Fourth, regular training on quality control will improve employee competence in maintaining product quality. Finally, periodic performance evaluations will ensure that quality standards are maintained and employees continue to develop. By implementing these solutions, the Tilapia Tofu Factory is expected to significantly improve product quality and increase competitiveness in the market.

CONCLUSIONS

This study concludes that the quality of tofu products at the Nila Tofu Factory has decreased, which is caused by weak quality control, lack of work motivation, suboptimal machine conditions, and the absence of written SOPs. The implementation of quality control is currently still carried out manually, with limited and inconsistent supervision, so it is not effective in ensuring quality stability. Human and managerial factors play a key role in maintaining quality, so a more integrative approach is needed between technical systems and human resource management. Suggestions from informants include technical and non-technical aspects, including HR training, incentives, procurement of new machines, and structured work evaluations.

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