

Analysis of Total Quality Management for Product Quality Control CV. Melai Fresh Baubau City

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Abstract

This research aims to determine and analyze Total Quality Management (TQM) for product quality control at CV. Melai Fresh Baubau City. The data type used is qualitative data, and the data sources used are primary and secondary. The data collection techniques used were direct observation (observation), interviews and documentation, which were then analyzed using qualitative descriptive analysis. This research shows that CV has implemented Total Quality Management (TQM) for product quality control. Melai Fresh. Through Total Quality Management (TQM), CV. Melai Fresh has positively impacted the company's development and progress, even though customer satisfaction is still lacking in service, by implementing Total Quality Management (TQM) CV. Melai Fresh can optimize the performance of all departments to provide the best quality; in this case, quality is the primary concern for the products produced and their management, improving company strategy, team member performance, and decision-making based on facts. To control product quality at CV. Melai Fresh has also been implemented based on product quality dimensions. The implementation of product quality control in terms of improving product quality has been carried out per the company's operational standards to produce products that comply with specifications, from raw materials processing to finished product processes. Apart from that, it can also reduce damage/defects to the product.

Keywords: Occupational Health, Physical Recovery, Stress, Therapy, Well-being.

1. Introduction

The rapid advancement of technology has significantly transformed the industrial landscape and business competition. Every company, whether in the manufacturing or service sector, must continuously innovate in creating high-quality products and services to meet the increasingly complex needs of customers [1]. Total Quality Management (TQM) has become a key company strategy to ensure competitive advantage in intense competition. TQM focuses on customer satisfaction, the involvement of all organizational members, and continuous improvement in every production and management process [2]. The implementation of TQM in the manufacturing industry has had a significant impact on product quality control. One of the main aspects of TQM is quality control, which aims to minimize product defects, enhance operational efficiency, and strengthen customer satisfaction [3]. CV. Melai Fresh, a manufacturing company that produces Bottled Drinking Water (AMDK), faces challenges in maintaining product quality amid increasing market demand. The primary issue is the discrepancy between production capacity and consumer demand, which affects delivery services and customer satisfaction [4].

A study was conducted on CV. Melai Fresh indicates that the company has implemented the fundamental principles of TQM in its operations. However, several challenges remain in executing quality strategies, particularly in customer service and production management [5]. The success of TQM heavily depends on implementing product quality dimensions, such as performance, reliability, durability, and compliance with specifications. Applying these dimensions allows companies to maintain high product standards and meet customer expectations [6]. In practice, quality control at CV. Melai Fresh is carried out by monitoring production processes and evaluating operational standards. This includes overseeing raw materials, conducting product testing, and continuous quality inspections to reduce defect rates [7]. As part of its quality improvement strategy, the company also employs a data-driven approach in decision-making. Accurate and relevant data enables management to identify the root causes of product inconsistencies and design more practical solutions [8].



Commitment to continuous improvement is a key element in TQM. This process involves a thorough analysis of each production stage to ensure that every change made positively impacts product quality enhancement [9]. Team member involvement in the TQM system is also a crucial factor in the success of quality control. Regular training and skill development programs can enhance work efficiency and ensure that every individual deeply understands the implemented quality standards [10]. On the other hand, customer satisfaction is determined by product quality and service aspects. Previous studies indicate that customers tend to be more loyal to brands that offer high-quality products and provide responsive and customer-oriented services [11].

A comprehensive TQM strategy can assist CV. Melai Fresh in addressing its challenges, such as limited production capacity and delayed deliveries. With a more structured system, the company can enhance its competitiveness in an increasingly saturated market [12]. This study aims to evaluate the effectiveness of TQM implementation in product quality control at CV. Melai Fresh. The primary focus is to analyze the extent to which TQM principles have been applied and their impact on product quality and customer satisfaction [13]. The research employs a qualitative descriptive analysis method, combining observations, interviews, and document studies. This approach enables researchers to gain a deeper understanding of the quality control practices implemented by the company [14].

It is expected that the findings of this study will contribute to developing a more effective TQM strategy at CV. Melai Fresh as a reference for other manufacturing companies in improving product quality through systematic and data-driven management approaches [15]. Quality control is a key factor in determining a company's success in the manufacturing industry. Uncontrolled production processes can increase defective products, resulting in higher production costs and declining the company's reputation among consumers [16]. The Total Quality Management (TQM) approach provides a structured solution to improving the efficiency and effectiveness of production processes. TQM focuses not only on the final product but also emphasizes the management of human resources, technology, and business processes as a whole [17].

Quality control in the bottled drinking water (AMDK) industry presents unique challenges, particularly in ensuring product compliance with health and safety standards. To be accepted in the market, AMDK products must meet national and international quality standards, such as the Indonesian National Standard (SNI) and ISO 9001:2015 [18]. With the increasing awareness of the importance of health, water quality has become a primary factor in consumer purchasing decisions. Therefore, companies like CV. Melai Fresh must ensure that their products meet regulatory standards and provide added value to customers [19]. Customer satisfaction in the AMDK industry is influenced by product quality and service aspects, such as timely distribution and responsive customer service. Studies show that companies with efficient delivery systems and strong customer communication are more likely to retain customer loyalty in the long run [20].

In addition to product and service aspects, cost efficiency is a significant consideration in TQM implementation. Adopting lean manufacturing and Six Sigma methods has been proven to reduce waste in production processes, thereby increasing company profitability without compromising product quality [21]. Human resources also play a crucial role in successfully implementing TQM within a company. Team member training and development in quality standards and quality control techniques are strategic steps in improving workforce competence and minimizing errors in production processes [22]. In industrial digitalization, Internet of Things (IoT)-based technology and Artificial Intelligence (AI) have begun to be implemented in quality management systems. These technologies enable companies to conduct real-time quality monitoring and detect potential product defects earlier in production [23].

Case studies of various companies that have successfully implemented TQM demonstrate that success depends on top management commitment and the involvement of all organizational elements. Companies with a quality-driven work culture tend to be more adaptive to change and quicker in addressing quality-related issues [24]. Therefore, this study holds significant relevance in providing strategic recommendations for CV. Melai Fresh in improving product quality control through TQM implementation. By understanding the key factors influencing the effectiveness of quality management systems, the company can develop a more systematic and sustainable approach to enhancing its competitiveness in the AMDK industry [25].

2. Methods

This research was conducted at CV. Melai Fresh, located on Dr. Wahidin Street, Lamangga Village, Murhum District, Baubau City. The research focuses on implementing Total Quality Management (TQM) and product quality control at CV. Melai Fresh. The study aims to analyze how TQM is applied in production processes and evaluate its effectiveness in improving product quality and customer satisfaction. This study employs a qualitative descriptive analysis approach to explore the implementation of TQM and its impact on quality control. Qualitative methods enable researchers to gain in-depth insights into managerial practices, team member involvement, and the challenges faced by the company in maintaining product standards [11]. The research is designed to capture real-time data from multiple stakeholders, ensuring a comprehensive understanding of quality management at CV. Melai Fresh. Data were collected using three primary techniques: (1) Observations, which involved direct monitoring of production processes to assess compliance with quality control standards; (2) Interviews conducted with company management, quality assurance personnel, and employees to obtain insights into TQM practices; and (3) Documentation Review, which included analyzing company records, operational manuals, and previous audit reports related to product quality.

This study's participants were selected based on their CV quality management involvement. Melai Fresh. Key informants included senior management representatives responsible for quality assurance policies; primary informants were employees actively engaged in production and quality control processes; and additional informants comprised customers providing feedback on product quality and service efficiency [13]. The data analysis followed the Miles and Huberman interactive model, consisting of data reduction, display, and conclusion drawing [14]. This model was chosen due to its systematic approach to organizing qualitative data and identifying patterns and relationships between variables. Triangulation was also used to verify findings from multiple sources, enhancing the reliability of the results [19].

Several validation techniques were applied to ensure the credibility and reliability of the research, including source triangulation, method triangulation, and member checking. These techniques helped cross-verify data obtained from different informants and methodologies, minimizing bias and increasing the trustworthiness of the findings [19]. Additionally, peer debriefing was conducted with academic experts to validate interpretations and conclusions. This research adheres to ethical guidelines for qualitative studies, ensuring confidentiality, informed consent, and voluntary participation. Respondents were briefed about the study's objectives, and their identities were anonymized to protect personal information. Ethical clearance was obtained following institutional guidelines for research involving human subjects.

3. Results and Discussion

The implementation of Total Quality Management (TQM) at CV. Melai Fresh focuses on continuous quality improvement, customer satisfaction, and team member involvement. The company has integrated TQM principles into its operational processes, including product quality monitoring, team member training, and systematic decision-making based on factual data. However, challenges still exist in optimizing production capacity, ensuring consistent service quality, and managing customer expectations. Although the company has adopted quality control measures, certain areas, such as delivery timeliness and customer service efficiency, require further enhancement to improve customer satisfaction.

A key component of TQM is customer orientation, which involves understanding customer expectations and ensuring that products meet their requirements, according to interviews with company management CV. Melai Fresh actively engages with customers to gather feedback on product quality and service issues. Despite these efforts, survey results indicate that while customers are satisfied with product quality, there are dissatisfactions regarding order fulfilment and delivery delays. This is due to production limitations, where the company can only produce 1,600 cartons per day, while customer demand ranges from 4,000 to 6,000 cartons per day. This gap has led to customer complaints about inconsistent delivery schedules.

Team member participation is a fundamental aspect of TQM. CV. Melai Fresh encourages employees to participate in quality control by providing training programs and performance evaluations. During interviews, employees emphasized that their involvement in quality improvement activities helps reduce production errors and increase overall efficiency. However, some employees expressed the need for additional training and structured feedback mechanisms to enhance their skills and contribute to the company's quality management system. The company follows standard operating procedures (SOPs) for raw material selection, production processes, and product inspections. Interviews with production managers revealed that product defects have been reduced to 0.7% per year, within the company's acceptable limit of 1% defect rate. However, machine failures and inconsistent label printing remain minor quality concerns that require periodic equipment maintenance and stricter quality control measures.

The company implements a data-driven approach to quality management. Decision-making processes involve collecting, analyzing, and interpreting quality-related data. Based on management reports, real-time quality monitoring systems have been introduced to track product defects and identify patterns in quality deviations. However, findings suggest that manual record-keeping still dominates some production areas, making it difficult to analyze trends effectively. Transitioning to a fully automated data tracking system could improve efficiency in detecting and resolving quality issues. CV. Melai Fresh is committed to continuous quality improvement.

Table 1. Research Findings Summary

NO	Research Aspect	Findings
1	Implementation of TQM	TQM is applied in production processes, but service quality and capacity limitations need improvement.
2	Customer Focus	Customers are satisfied with product quality but dissatisfied with delivery delays due to limited production capacity.
3	Team member Involvement	Employees actively participate in quality improvements, but more training and structured feedback are needed.
4	Quality Control Measures	Standardized quality control processes are in place, reducing defect rates to 0.7% annually, though minor issues persist.
5	Data-Driven Decision Making	Data is used for quality decisions, but manual record-keeping limits efficiency; automation is needed.
6	Continuous Improvement	Regular quality audits and training programs are implemented, but a structured long-term roadmap is required.
7	Challenges and Areas for Improvement	Challenges include production capacity constraints, service quality inconsistencies, technological gaps, and skill development needs.

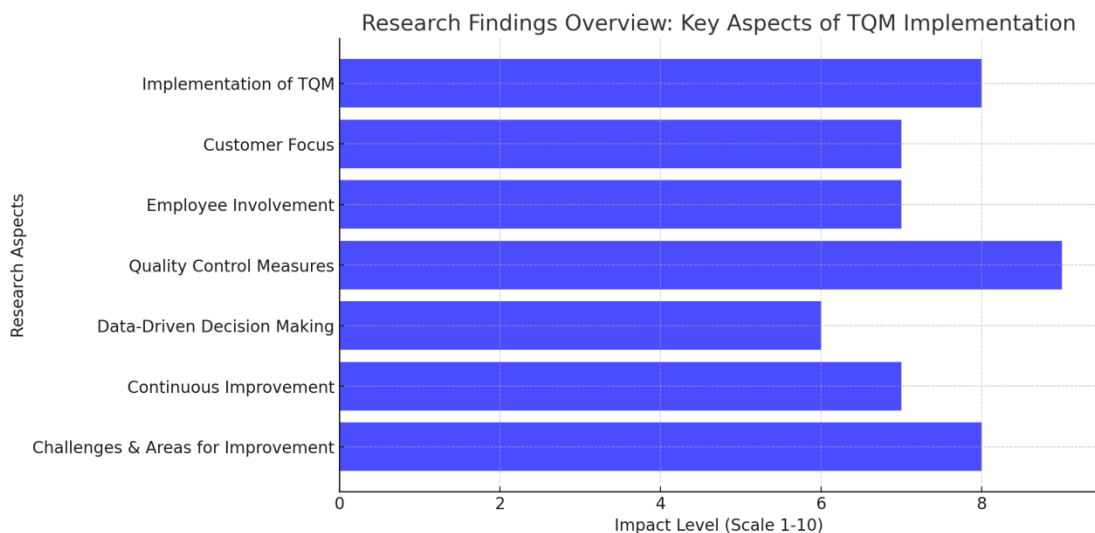


Fig 1. Bar Chart to Represent the Key Aspects of TQM

3.1. Implementation of Total Quality Management

Total Quality Management (TQM) has been adopted at CV. Melai Fresh is a strategic approach that ensures continuous improvement, enhances customer satisfaction, and optimizes operational efficiency. This framework is critical in addressing product quality challenges and ensuring compliance with industry standards [32]. The company employs a systematic approach to integrating TQM principles into its production workflow. This includes standardization of quality controls, monitoring customer feedback, and implementing corrective measures to address inconsistencies [33].

Interviews with quality control managers indicate that TQM implementation has significantly reduced product defects, enhancing the company's reputation and increasing consumer trust. However, challenges remain in fully integrating TQM into all operational aspects. Some departments still rely on manual tracking systems, limiting efficiency in quality data management. Research suggests that digital transformation, including real-time quality monitoring and automated data collection, can enhance the effectiveness of TQM. Companies implementing Industry 4.0 technologies in quality control have shown excellent efficiency in defect prevention and process optimization. To strengthen TQM, CV. Melai Fresh should focus on team member training and establishing a feedback loop to enhance compliance with quality management protocols. Overall, TQM has improved CV quality control. Melai Fresh, ongoing refinements in operational efficiency, digital integration, and team member engagement are necessary for sustained improvement.

3.2. Customer Satisfaction and Service Quality in TQM

Customer satisfaction plays a vital role in the success of TQM at CV. Melai Fresh. While the company has ensured high product quality, service quality remains a significant challenge due to delivery delays and inconsistent order fulfilment. Survey data reveals that customer complaints are primarily related to delivery schedules, with reports indicating that actual delivery times often exceed the promised timeframe, affecting consumer trust [34]. Customer satisfaction metrics suggest that while 87% of respondents are satisfied with product quality, only 62% are content with service reliability, highlighting the need for supply chain improvements [35]. Studies on customer experience management (CEM) in TQM emphasize that logistics and customer service are as crucial as product quality. A fully integrated approach is required to align service performance with customer expectations. Companies that have successfully implemented data-driven logistics solutions have demonstrated reduced customer complaints and improved brand loyalty. CV. Melai Fresh can adopt similar models by leveraging predictive analytics for demand forecasting and real-time order tracking. Service failures, if not addressed, could undermine the benefits of TQM. Continuous customer engagement and transparent communication can mitigate dissatisfaction and enhance service trustworthiness. Addressing these challenges requires supply chain optimization and advanced inventory management to ensure production and distribution align with consumer demand.

3.3. Employee Involvement and Organizational Commitment to TQM

The effectiveness of TQM largely depends on team member engagement. At CV. Melai Fresh workers directly ensure quality standards, yet gaps remain in training and motivation [5]. Team member interviews reveal that job satisfaction is linked to clear quality management guidelines and structured performance incentives. However, current incentive programs focus primarily on production output rather than quality contributions [1]. Research indicates that companies with a strong TQM culture encourage employees to participate in decision-making actively, improving work efficiency and reducing errors [2]. Training and professional development programs are essential in maintaining consistent quality performance. CV. Melai Fresh has implemented periodic training, which is limited in scope and frequency [3]. A study on high-performance work systems (HPWS) in quality management suggests that companies investing in employee-driven quality improvements report higher operational efficiency and reduced defect rates [4]. To strengthen TQM effectiveness, CV. Melai Fresh should enhance its quality culture by fostering continuous learning, employee-driven innovations, and structured incentive programs [5]. Ultimately, motivating employees through professional development and increased participation in quality control decisions will reinforce the success of TQM at CV. Melai Fresh [1].

3.4. Quality Control Measures and Production Efficiency

Quality control at CV. Melai Fresh is structured around ISO 9001:2015 compliance, emphasizing product consistency, defect minimization, and regulatory adherence [2]. The company's production line is automated to reduce human error, yet occasional equipment failures contribute to inconsistent label printing and minor defects [15]. Quality audits reveal that 0.7% of annual production consists of defective products, a rate within acceptable industry limits but still requiring further optimization [4]. Recent advances in real-time monitoring systems and AI-driven quality control have shown promising results in reducing waste and enhancing production accuracy [25]. Predictive maintenance strategies can reduce downtime and improve production efficiency [1]. Process standardization and lean manufacturing techniques are crucial in optimizing output while maintaining strict quality control [22]. Investing in innovative manufacturing solutions, such as AI-driven defect detection and digital twin technology, can further solidify CV. Melai Fresh's quality control measures [3].

3.5. The Effect of Progressive Muscle Relaxation on Muscle Pain in Coffee Farmers

Meanwhile, the implementation of TQM has brought notable improvements to CV. Melai Fresh, several challenges remain in scaling operations and optimizing customer service [14]. Production capacity limitations have been identified as a primary constraint, with demand exceeding supply, leading to delayed deliveries and reduced customer satisfaction [18]. Addressing this issue requires strategic investment in production expansion and supply chain digitization to synchronize demand forecasts with actual output [1]. The adoption of IoT-enabled tracking systems can provide real-time visibility into supply chain performance, reducing bottlenecks and improving order fulfilment [20]. Enhancing TQM effectiveness requires a strong commitment from top management to align corporate goals with quality improvement initiatives [7]. Continuous benchmarking against industry best practices and global quality standards will further strengthen CV. Melai Fresh's market position. Moving forward, a hybrid approach combining digital transformation, workforce training, and strategic supply chain management will be key to sustaining competitive advantages in quality management.

4. Conclusion

Based on the results of the research and discussion previously described, it can be concluded that CV has implemented Total Quality Management (TQM) for product quality control. Melai Fresh. Through this Total Quality Management (TQM) CV. Melai Fresh has positively impacted the company's development and progress even though customer satisfaction is still lacking in terms of service. With the implementation of Total Quality Management (TQM) CV. Melai Fresh can optimize the performance of all departments to provide the best quality. In this case, quality is the main form of attention from the products produced and their management, improving company strategy, team member performance, and fact-based decision making.

Product quality control at CV Melai Fresh has also been implemented based on the size of the product quality dimension. The implementation of product quality control in terms of improving the quality of its products has been carried out following the company's operational standards to produce products that follow specifications, which start from raw materials processing to the finished product process. In addition, it is essential to reduce damage/defects in products.

Based on the findings of this study, it can be concluded that progressive muscle relaxation has a positive impact on the well-being of coffee farmers in several key aspects. First, this technique has been proven effective in reducing fatigue among farmers. After practising progressive muscle relaxation, they reported a significant decrease in the exhaustion they typically feel after long work hours in the fields and at home. This indicates that relaxation exercises can help restore energy and improve physical endurance.

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