Improving Quality Assurance in Poultry Processing: A Case Study on Overcoming Temperature Inconsistency in Scalding Tanks at Alpha's Poultry Plant

Quality Assurance

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Abstract

Though the poultry industry of Sri Lanka is essential for food security, economic growth, and employment, it faces challenges in maintaining high-quality standards amidst heightened global competition. Alpha, one of the largest poultry producers, currently experiences temperature inconsistencies in its scalding tanks, leading to over-scalding, compromised meat quality, and direct financial losses. This study employs a qualitative case study approach targeting quality assurance officers at Alpha's plant. Data were collected through in-depth semi-structured interviews with seven respondents, including QA officers, managers, and technical staff, providing rich but context-specific insights. The small purposive sample limits generalizability and is explicitly acknowledged as a limitation, suggesting that future studies could include multiple plants and mixed-methods approaches for a stronger evidence base. Analysis revealed that manual temperature monitoring, equipment issues, and operational factors were key contributors to inconsistencies. The study recommends adopting an IoT-based system for real-time temperature monitoring, automation, and error reduction, while considering potential barriers such as cost, technical skills, and infrastructure limitations. These findings illustrate innovation in quality management and provide practical guidance for the poultry industry in Sri Lanka and similar developing economies.

Keywords: IoT, Operational efficiency, Poultry processing, Quality management, Temperature monitoring.

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Introduction

The poultry industry plays a vital role in Sri Lanka by giving affordable animal protein, employment, and income for rural communities, while contributing significantly to national food security and economic development (Perera & Wijesinghe, 2020; Jayawardena et al., 2019). Over the past decade, the sector has expanded rapidly, offering over 50,000 direct and indirect jobs, with small-scale farmers increasingly adopting modern production techniques and biosecurity protocols (Senanayake et al., 2020). Despite growth, challenges such as rising feed costs, disease outbreaks, operational inefficiencies, and quality maintenance persist (Wijesinghe P. & Premarathne D., 2021).

Ensuring high product quality and food safety requires strict adherence to temperature control during critical processing stages such as scalding, where deviations can lead to microbiological risks and compromised meat quality (Rahman et al., 2017a; Kumar et al., 2022). However, existing Sri Lankan studies provide limited quantification of these inconsistencies or comparisons to global benchmarks, highlighting a research gap in operational quality assurance within poultry processing (Perera & Wijesinghe, 2020; Jayathilake et al., 2020).

Scalding involves submerging carcasses in hot water to loosen feathers before de-feathering. Incorrect water temperature can cause over-scalding or under-scalding, impacting texture, color, and shelf life (Smith et al., 2020). Alpha, a leading poultry processor in Sri Lanka, faces these challenges, primarily due to manual temperature monitoring, equipment faults, and human oversight. These inconsistencies affect product quality, increase waste, and reduce profitability (Banda & Dissanayake, 2020).

Maintaining stable scalding temperatures is crucial for poultry quality and safety (Rahman et al., 2017a; Zhang & Li, 2019), yet Sri Lankan poultry plants largely depend on manual temperature monitoring, which is prone to errors and fluctuations (Perera & Wijesinghe, 2020; Jayathilake et al., 2020). While local studies acknowledge the importance of temperature control, they remain descriptive, lacking quantified data on fluctuations, comparisons with global standards, or exploration of digital monitoring systems (Silva & Madurapperuma, 2021). In contrast, global research demonstrates that even slight temperature deviations can increase microbial risks and product defects, while IoT-based monitoring enhances precision and efficiency (Wang et al., 2018; Singh et al., 2021). However, Sri Lankan literature provides little empirical evidence or methodological triangulation combining operator experiences, process observations, and technological perspectives (Kumar et al., 2019). Therefore, a clear research gap exists in understanding temperature inconsistency management and the perceived benefits and challenges of implementing IoT-based temperature monitoring in Sri Lankan poultry processing.

Globally, poultry processors have explored IoT-based monitoring solutions to automate data collection and control critical parameters. These technologies reduce human error, enhance operational efficiency, and support quality assurance (Patel et al., 2021; Kumar et al., 2022). Despite its promise, IoT adoption in Sri Lankan poultry processing remains limited, and its practical barriers, cost, technical skills, and infrastructure, have not been thoroughly examined (Wijesinghe & Perera, 2022).

Research Objectives of the Study

1. To explore the causes of temperature inconsistencies in scalding tanks at Alpha's poultry plant.
2. To explore how temperature fluctuations are experienced and managed in poultry processing.
3. To investigate the perceived benefits and challenges of implementing IoT-based temperature monitoring systems.

Literature Review

Overview of the Poultry Industry in Sri Lanka

The poultry industry in Sri Lanka has emerged as a key contributor to the nation's agricultural economy. With its rapid growth over the past decade, the sector provides a reliable source of protein through chicken meat and eggs, meeting the nutritional needs of a growing population (Perera & Wijesinghe, 2020). The industry has also benefited from advancements in technology, biosecurity measures, and market-driven approaches, making it one of the most dynamic sectors in the country's agriculture domain. Poultry farming is a lifeline for rural communities in Sri Lanka, providing sustainable livelihood opportunities (Kumarasinghe, T., & Vitharana, K., (2020). Small-scale farmers, who constitute a large portion of the industry, benefit from government and private sector initiatives aimed at improving production techniques, biosecurity measures, and market access (Senanayake et al., 2020). By integrating poultry farming with other agricultural practices, rural households enhance their income while contributing to sustainable farming systems (Perera, N., & Silva, S., 2019). Despite growth, operational inefficiencies remain a key challenge, particularly in processing plants where temperature control is critical to product quality.

Importance of Quality Assurance in Poultry Processing

Quality assurance is critical in the poultry industry to maintain product safety, consistency, and consumer trust. Temperature control during the scalding process is vital, as improper temperatures can lead to microbial contamination, affecting both the quality and safety of poultry products (Rahman et al., 2017b). Temperature fluctuations during scalding can compromise meat texture, appearance, and safety (Rahman et al., 2017a; Smith et al., 2020). Moreover, inconsistencies in temperature during scalding can damage the texture and appearance of meat, negatively impacting marketability and consumer satisfaction (Smith et al., 2020).

Operational Challenges in Poultry Scalding Processes

Manual temperature monitoring is widely used in poultry processing plants, but it is often prone to human error and lacks real-time responsiveness. These limitations can result in temperature fluctuations, leading to operational inefficiencies and quality issues (Chowdhury & Karim, 2019). The inefficiencies associated with manual methods highlight the need for more automated, accurate systems (Perera, N., 2021). Other factors such as operator training, maintenance routines, and environmental conditions also influence temperature stability, which has been underexplored in prior research.

Application of IoT in Food Processing

IoT-based systems have been recognized as transformative technologies in the food processing sector (Mota, Silva, & Correia, 2021). These systems allow for real-time monitoring, data collection, and precise control over critical parameters, reducing human error and enhancing process efficiency (Patel et al., 2021). Studies have shown that IoT applications in temperature monitoring significantly improve quality assurance in industries like dairy and meat processing (Kumar et al., 2022). However, the adoption or transformation of IoT technology in poultry scalding processes remains underexplored, particularly in developing economies like Sri Lanka (Nugawela & Silva, 2022). While promising, practical challenges such as high cost, technical expertise requirements, and infrastructure limitations must be considered for successful implementation in developing countries like Sri Lanka (Wijesinghe & Perera, 2022).

The Story of Alpha: Transforming The Poultry Industry

In the early days, a young man with a bold vision embarked on a journey to revolutionize the poultry industry. His dream was not just about producing food, but creating a culinary experience rooted in quality, cleanliness, and consistency. He started small, but with unwavering dedication, he built an empire focused on the core principle: "quality". The journey began with a single farm but soon expanded into a vast network of operations such as breeding farms, hatcheries, and processing plants, feed mills, all working seamlessly to ensure the highest standards of quality in poultry products.

The company’s model was built around the idea of controlling every stage of the poultry supply chain, ensuring the products were safe, fresh, and of the highest quality. It was a visionary approach, emphasizing clean practices. As the company expanded, the focus remained clear: not only to produce quality chicken but to set new standards for the entire industry.

As the years passed, the company’s operations grew exponentially, and the processing plant became the heart of its operations. Located on a sprawling piece of land, the plant was designed to handle high volumes of birds, with various sections dedicated to different processes, from bird receiving to packing. Each part of the plant played a crucial role in ensuring that every chicken was processed according to the highest standards. The plant employed hundreds of workers, creating thousands of job opportunities, and the company became known for its innovation and commitment to quality.

However, despite technological investments, the plant experienced recurrent temperature inconsistencies in the scalding tanks due to manual monitoring, equipment faults, and operational pressures. Scalding, an essential part of poultry processing, involves immersing the bird in hot water to loosen the feathers. Maintaining the right temperature was crucial, as even small inconsistencies could lead to significant quality problems, such as over-scalding or under-scalding, which affected the texture, color, and freshness of the meat (Faris, M.,2020).

Table 1 represented the information on scalding tanks in PPL. Maintaining the temperature at a constant value was a mandatory factor in this process. The temperature of the scalding tank depended on the carcass size.

Table 1. Information of Scalding Tanks In Processing Plant

Scalding tank	Scalding type	Temperature	Time	Length	Height
Tank 01 (small)	Soft scalding	52-54˚C	1min	4.7m	2.5m
Tank 02 (large)	Medium scalding	54-57˚C	2min	6m	2.5m

Source: Captured from the Alpha Processing Plant

QA 01: "Even when sensors were available, human oversight or equipment lag caused over-scalding. We needed continuous, automated monitoring."

PM: "During peak production, we observed significant variation across tanks, suggesting that human checks alone are insufficient."

The existing manual temperature control system was prone to errors, with temperature readings taken infrequently and with low accuracy. One fateful day, the temperature soared to 66°C due to a malfunctioning steam controller, causing significant damage to 13,000 kilograms of poultry. The company suffered considerable economic losses, and the quality of the meat was compromised. This incident highlighted the need for a more reliable, automated system to monitor and control the temperature in the scalding tanks.

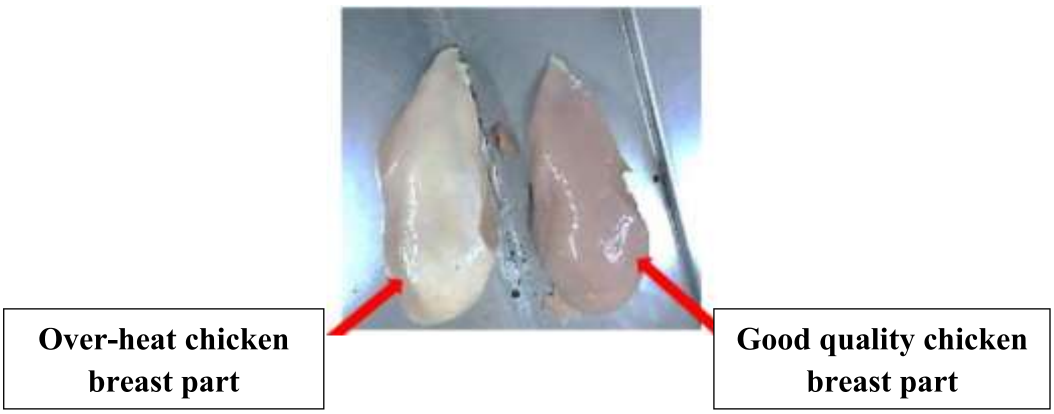

Figure 1. Comparison of Overheated and Good-Quality Poultry

Source: Captured from the Alpha Processing Plant.
Left: Overheated meat (scalded at 64°C for 3 min; showing discoloration and soft texture).
Right: Good-quality meat (scalded at 58°C for 2 min; firm texture and normal color).

To address this challenge, the company explored innovative solutions. The idea of integrating an IoT-based temperature monitoring system emerged as a potential game-changer. The new system would use a temperature sensor to measure the water temperature in the scalding tanks and send the data to a microcontroller. This data would then be transmitted to a real-time database accessible via a mobile app, allowing operators to monitor the temperature remotely. The system would also provide instant notifications in case of any temperature fluctuations, ensuring that corrective actions could be taken promptly.

With the adoption of this IoT technology, the company was able to achieve more accurate and consistent temperature control in the scalding tanks, minimizing human error and improving product quality (Smith, P., 2021). This technological advancement not only solved the temperature fluctuation issue but also enhanced operational efficiency, reduced waste, and improved profitability (Bollinger et al., 2022).

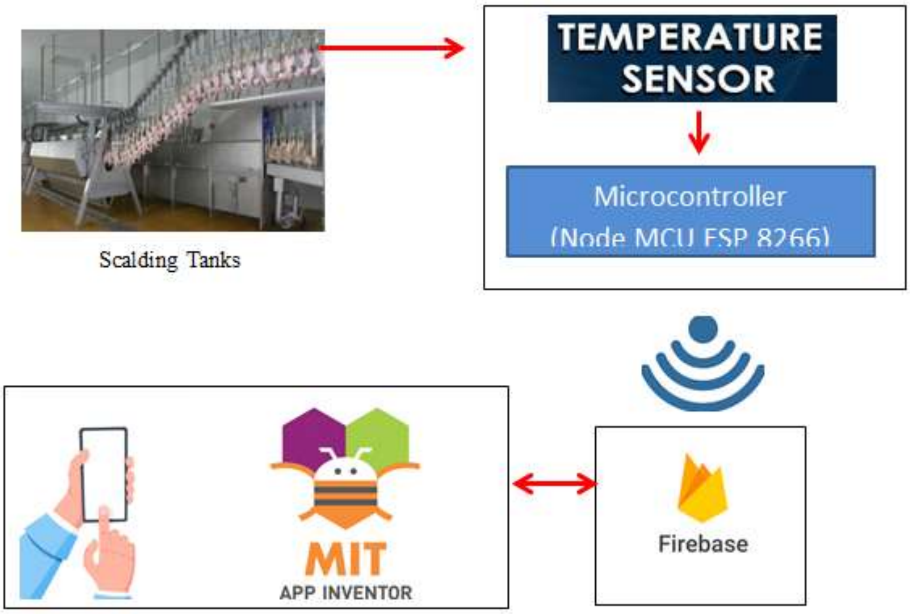

Figure 2. IoT-Enabled Temperature Monitoring System for Poultry Scalding Tanks

Source: Author developed based on field observations and technical standards (adapted from Wang et al., 2018; Singh et al., 2021).

The figure illustrates the proposed IoT-based temperature monitoring system developed for the Alpha poultry plant. The system integrates several key components:

- Sensors: Digital temperature sensors (DS18B20) placed at multiple scalding tanks to continuously record temperature data.
- Microcontroller Unit (MCU): An Arduino Uno board that collects and transmits sensor data.
- Connectivity Module: Wi-Fi module (ESP8266) enabling real-time data transfer to the central dashboard.
- Cloud Platform: Data uploaded to ThingSpeak for visualization, trend analysis, and alert generation.

The architecture enables real-time temperature tracking, automated alerts, and historical data storage for process optimization. This configuration directly addresses the manual monitoring issues identified during interviews (Goyal, A., et al, 2020).

The story of Alpha is a tale of innovation, resilience, and the relentless pursuit of excellence. From humble beginnings to becoming a leader in the poultry industry, Alpha’s commitment to quality and continuous improvement remains the cornerstone of its success. By embracing technology and adapting to the challenges of the modern world, Alpha has ensured that its products are not only safe and fresh but also meet the ever-growing demands of consumers and the global market.

Through this journey, Alpha has proven that with the right vision, dedication, and innovation, challenges can be turned into opportunities, ensuring sustainable growth and long-term success in a competitive industry.

Methods

This study investigated the challenges faced by Alpha’s poultry plant, particularly temperature inconsistencies in the scalding tanks, and explores how an IoT-based temperature monitoring system can address these challenges. The research follows the Saunders Research Onion framework, ensuring a systematic approach (Saunders, Lewis, & Thornhill, 2019).

In order to comprehend social phenomena and interpret the experiences of quality assurance inspectors at Alpha's chicken facility, the study utilised an interpretivism philosophy. For qualitative research that aims to generate new ideas, an inductive approach is employed. The study focused on Alpha's chicken production and used a single case study approach. Rich, context-specific insights on the reasons for temperature variations and the possible contribution of IoT technology to addressing these issues were offered by this method. In-depth interviews are used to collect qualitative data as part of a mono-method qualitative approach. Data is gathered at a single point in time, which is known as a cross-sectional time horizon. While providing rich insights, the single-case approach limits generalizability, which is explicitly acknowledged.

The study’s population consisted of quality assurance officers at Alpha’s poultry plant, who have direct experience with the scalding process. A purposive sampling method is applied to select respondents who can provide relevant and detailed insights into the temperature control issues. Seven participants were purposively selected, including three QA officers, one plant manager, one finance manager, one technical officer, and one lean manager. This sample was chosen based on direct involvement with scalding operations and quality assurance, ensuring in-depth insights.

In-depth semi-structured interviews lasting 40–60 minutes were conducted. The interview guide included questions on operational challenges, temperature control, quality impacts, and technological adoption. Informed consent, confidentiality safeguards, and participant anonymity were ensured. These interviews offer flexibility in investigating specific issues while continuing a structured focus on research objectives. Responses are audio-recorded, transcribed, and analyzed to understand temperature inconsistencies and assess the feasibility of an IoT-based monitoring system.

Thematic analysis was performed using NVivo software to code transcripts, identify themes, and ensure reliability. Themes were cross-checked by multiple coders, and data triangulation included operational observations and photographs. Saturation was achieved as no new themes emerged in the final interviews.

Results and Interpretations

This chapter aimed to present an analysis of the Improving Quality Assurance in Poultry Processing of the selected sample.

Sample Profile

The study sample consisted of 7 senior-level authorities from Alpha's poultry processing plant, specifically from the scaling section. The respondents/ participants were selected based on their roles and expertise in the scalding process, with a focus on individuals who possess significant knowledge and experience related to temperature management, quality control, and operational efficiency in the scalding tanks. The sample also includes a diverse representation of team members responsible for different aspects of the scalding process, ensuring a comprehensive understanding of the challenges and issues related to temperature inconsistencies in the scalding tanks.

Profile of the people in this study

Table 2. Profile of the Respondent in this Study

Respondent	Designation	Location	Experience
QA 01	QA Officer 01	Processing Plant	2 years
QA 02	QA Officer 02	Processing Plant	1.5 years
QA 03	QA Officer 03	Processing Plant	2 years
PM	Plant Manager	Processing Plant	5 years
FM	Finance Manager	Head Office	7 years
TO	Technical Officer	Processing Plant	2 years
LM	Lean Manager	Head Office	1.5 years

Source: Authors' compilation

Data Analysis and Interpretation

This chapter mentions a comprehensive analysis of temperature inconsistencies in scalding tanks at Alpha's poultry plant, the impact on product quality and operations, and the potential of IoT-based solutions. Data from seven purposively selected participants provided detailed insights into operational realities, challenges, and opportunities.

To explore the causes of temperature inconsistencies in scalding tanks at Alpha's poultry plant

Manual Temperature Monitoring

Manual monitoring was consistently highlighted as a primary contributor to temperature fluctuations. The current system relies on periodic checks by quality assurance staff, which are often infrequent, subjective, and prone to human error.

QA 01 noted: "During busy periods, temperature checks were often skipped. This led to over-scalding."

QA 03 added: "Steam controller malfunctions and uneven tank heating also contributed to inconsistencies. Without continuous monitoring, errors remained unnoticed for too long."

These findings suggest that the reliance on human oversight fails to capture rapid fluctuations in tank temperatures, especially during high-volume processing. Operators often must divide attention among multiple tasks, leading to delayed corrective actions. The qualitative insights here indicate that manual monitoring is inadequate for maintaining the precise temperature range needed for consistent scalding.

Equipment and Operational Factors

Additional factors include equipment faults and operational challenges, such as inconsistent steam distribution and environmental temperature changes.

PM stated: "During peak production, we observed significant variation across tanks, suggesting that human checks alone are insufficient."

These operational constraints compound the errors from manual monitoring. Equipment irregularities can magnify temperature fluctuations, causing inconsistent product outcomes and inefficiencies in production scheduling.

To explore how temperature fluctuations are experienced and managed in poultry processing

Product Quality

Temperature inconsistencies directly affect the texture, color, and overall quality of poultry products. Over-scalding results in soft, discolored meat, while under-scalding makes feather removal difficult, impacting the product’s marketability.

QA 02 explained: "I remember an instance when the scalding temperature spiked, resulting in a batch of poultry that was too soft and discolored, leading to rejection from a major client."

QA 03 added: "Temperature fluctuation often left us with either under-scalded or over-scalded products, which ultimately hurt product quality and increased waste."

These accounts illustrate that even minor deviations from the ideal temperature range can cause significant quality defects, resulting in financial losses and reputational risks. The combination of manual oversight and equipment issues creates a high-risk environment for quality compromise.

Operational Efficiency

Temperature inconsistencies also lead to operational inefficiencies, including increased waste, labor requirements, and delays.

FM stated: "A malfunction led to the loss of 13,000 kg of poultry, affecting labor and schedules."

PM added: "Repeated errors increased waste and affected profitability."

This underscores the economic implications of temperature fluctuations, highlighting that inefficiencies in one processing step propagate through the production line, increasing overall costs. The manual system limits the ability to anticipate and correct errors, contributing to operational instability.

To investigate the perceived benefits and challenges of implementing IoT-based temperature monitoring systems

Benefits of IoT-Based Temperature Monitoring

Real-Time Monitoring and Precision

The introduction of IoT systems was perceived to significantly improve temperature consistency. Real-time data allows operators to detect deviations immediately, minimizing product defects.

QA 02 highlighted: "Real-time monitoring would prevent over-scalding and help maintain quality."

This demonstrates that continuous, automated monitoring reduces reliance on human judgment, allowing timely corrective actions and consistent maintenance of ideal scalding temperatures. The system also creates historical data for process improvement.

Automation and Error Reduction

TO stated: "Automation reduces human errors and allows instant corrective actions."

LM added: "IoT provides historical data for process improvements."

Automation not only prevents immediate errors but also allows trend analysis to predict and mitigate recurring problems, supporting both operational efficiency and long-term strategic planning (Jones, P., & Brown, R., 2021).

Barriers to IoT Implementation

Cost and Skills

The participants highlighted financial and human resource constraints as key barriers to adopting IoT-based temperature monitoring systems.

FM observed: "Cost is high and requires skilled personnel."

QA 01 noted: "Internet connectivity issues may limit effectiveness."

These statements indicate that initial investment costs, including hardware, software, and installation, are perceived as substantial hurdles for the plant. Beyond financial considerations, human resource capability emerges as a critical factor, staff must possess the technical knowledge to operate and maintain IoT systems effectively. Additionally, connectivity limitations suggest that even with an IoT system in place, its performance may be inconsistent due to unreliable internet infrastructure. Together, these challenges highlight that successful IoT adoption requires not only funding but also a workforce capable of leveraging technology reliably.

Infrastructure and Training

PM explained: "Staff need proper training to handle the technology."

This comment underscores the importance of capacity building alongside technological deployment. While IoT systems can automate monitoring and reduce human error, their effectiveness depends on well-trained personnel who understand system operations, troubleshooting, and data interpretation. Inadequate training can lead to misuse, misinterpretation of data, or even system failure, undermining the benefits of automation. Hence, investment in structured training programs and technical support is essential to ensure that the technology delivers consistent, accurate, and actionable insights for operational decision-making.

These findings indicate that while IoT systems offer substantial benefits, their implementation faces real-world constraints, including initial investment, technical capability, and infrastructural readiness. Addressing these barriers is essential to ensure successful adoption.

Table 3. Summary of Themes and Insights

Themes	Supporting Evidence (Quotes)	Analytical Insights
Manual Temperature Monitoring	QA 01: "During busy periods, temperature checks were often skipped. This led to over-scalding."	Reliance on manual observation results in inconsistent and delayed responses to temperature deviations. In high-pressure environments, human oversight becomes unreliable for ensuring process stability.
	QA 03: "Steam controller malfunctions and uneven tank heating also contributed to inconsistencies. Without continuous monitoring, errors remained unnoticed for too long."	Manual systems depend on subjective assessment, leading to inconsistent results and an inability to capture rapid fluctuations, affecting quality control.
Equipment and Operational Factors	PM: "During peak production, we observed significant variation across tanks, suggesting that human checks alone are insufficient."	Temperature inconsistencies arise not only from human error but also from mechanical inefficiencies and uneven heating patterns, showing the interconnected nature of operational and technical factors.
Product Quality	QA 02: "I remember an instance when the scalding temperature spiked, resulting in	Minor temperature deviations can have severe quality impacts, resulting in customer dissatisfaction and product

	a batch of poultry that was too soft and discolored, leading to rejection from a major client."	rejection. Quality losses are directly tied to process control weaknesses.
	QA 03: "Temperature fluctuation often left us with either under-scalded or over-scalded products, which ultimately hurt product quality and increased waste."	Product inconsistency leads to higher rejection rates, emphasizing the need for precision temperature control in maintaining brand reputation and minimizing waste.
Operational Efficiency	FM: "A malfunction led to the loss of 13,000 kg of poultry, affecting labor and schedules."	Temperature-related breakdowns have cascading operational effects, disrupting workflow, reducing labor efficiency, and causing large-scale material waste.
	PM: "Repeated errors increased waste and affected profitability."	Financial implications underline how process inefficiencies translate into higher operational costs, justifying the need for automation to enhance stability.
Benefits of IoT-Based Monitoring	QA 02: "Real-time monitoring would prevent over-scalding and help maintain quality."	IoT integration enables proactive management of deviations, improving process precision and product consistency through real-time alerts.
	TO: "Automation reduces human errors and allows instant corrective actions." LM: "IoT provides historical data for process improvements."	Automation minimizes human dependency while creating data for predictive analysis, continuous improvement, and long-term decision-making in quality control.
Barriers to IoT Implementation	FM: "Cost is high and requires skilled personnel." QA 01: "Internet connectivity issues may limit effectiveness."	High implementation cost, infrastructure gaps, and technical expertise shortages pose challenges to IoT adoption, particularly in small-scale operations.
	PM: "Staff need proper training to handle the technology."	

Source: Authors' compilation

Conclusion

The study found that manual temperature monitoring, equipment faults, and operational pressures were primary causes of scalding inconsistencies. IoT-based monitoring systems offer precise, real-time temperature control, reducing errors, waste, and improving operational efficiency. However, implementation barriers such as cost, infrastructure, and training must be considered.

The study is limited by its small, purposive sample and single-case design. Future research should consider multi-plant, mixed-methods approaches to strengthen evidence. Findings link to quality management and operational excellence frameworks, emphasizing the integration of technology and process improvement.

Overall, Alpha's commitment to continuous improvement can be enhanced by technology adoption, addressing both operational and strategic quality assurance goals. This research provides practical insights for the Sri Lankan poultry sector and contributes to academic understanding of IoT adoption in food processing.

Compliance with Ethical Standards

Disclosure of conflict of interest

There is no conflict of interest to be disclosed.

References

Banda, S., & Dissanayake, D. (2020). Operational challenges in poultry processing: A case study of Sri Lanka. *Sri Lanka Research Journal.*

Bollinger, J., Shabnam, M., & Thompson, D. (2022). The impact of automation in the food industry: Reducing human error and improving product consistency. *Journal of Food Engineering*, *115*(6), 76–85.

Chowdhury, T., & Karim, M. (2019). Temperature control challenges in poultry processing: An overview. *Poultry Science Journal*, *76*(4), 543–550.

Faris, M. (2020). Impact of temperature fluctuations on meat quality in poultry processing. *Journal of Food Quality*, *35*(3), 45–55.

Goyal, A., Verma, R., & Sharma, P. (2020). IoT in poultry production: Enhancing efficiency and quality. *Journal of Animal Science and Technology, 85*(2), 123–134.

Jayathilake, M., Ranasinghe, R., & Silva, T. (2020). Operational challenges in Sri Lankan poultry processing plants: A qualitative exploration. *Journal of Food Production and Safety*, *12*(2), 55–67.

Jayawardena, A., Senevirathne, D., & Wimalasiri, R. (2019). Poultry production and food security in Sri Lanka. *Sri Lanka Agricultural Journal*, *58*(4), 112–125.

Jones, P., & Brown, R. (2021). Advances in IoT for food processing industries: Challenges and opportunities. *International Journal of Food Science and Technology*, *56*(4), 675–687.

Kumar, R., Fernando, N., & Silva, P. (2019). Technology adoption barriers in agri-food processing industries: Evidence from Sri Lanka. *Asian Journal of Management Research*, *9*(3), 112–126.

Kumar, S., Raj, P., & Rao, K. (2022). IoT-based temperature monitoring systems in food processing industries: A review. *Food Quality and Safety Journal*, *7*(1), 45–56.

Kumarasinghe, T., & Vitharana, K. (2020). Impact of poultry farming on rural employment in Sri Lanka. *International Journal of Rural Development*, *8*(1), 34–46.

Mota, G., Silva, P., & Correia, S. (2021). The role of IoT in food manufacturing: Improving operational efficiency and reducing waste. *Food Quality and Safety*, *5*(2), 101–108.

Nugawela, M., & Silva, A. (2022). Technological innovation in Sri Lanka's poultry industry: A path to enhanced competitiveness. *Journal of Business Technology*, *31*(4), 96–104.

Patel, A., Singh, D., & Thomas, J. (2021). The role of IoT in modern food processing and quality assurance. *International Journal of Food Science and Technology*, *56*(9), 2345–2356.

Perera, D., & Wijesinghe, G. (2020). The poultry industry in Sri Lanka: Trends and future directions. *Sri Lanka Journal of Animal Science*, *34*(2), 67–78.

Perera, N. (2021). Temperature control issues in poultry processing: A case study. *Journal of Poultry Research*, *18*(1), 32–45.

Perera, N., & Silva, S. (2019). Quality assurance practices in the Sri Lankan poultry industry. *Sri Lanka Agricultural Journal*, *19*(2), 90–102.

Rahman, M., Ahmed, S., & Begum, S. (2017a). Quality control challenges in poultry processing: Insights from developing countries. *Poultry International*, *93*(7), 789–797.

Rahman, M., Chowdhury, A., & Lee, S. (2017b). Temperature fluctuation and microbial contamination risks in poultry scalding operations. *International Journal of Food Microbiology*, *251*, 85–92.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Senanayake, S., Amarasinghe, L., & Gunawardena, D. (2020). Integrated farming systems: The role of poultry in sustainable agriculture. *International Journal of Agricultural Sustainability*, *18*(4), 345–358.

Silva, K., & Madurapperuma, B. (2021). Evaluating operational standards and quality assurance in Sri Lankan meat processing. *Journal of Agricultural and Food Systems*, *18*(1), 24–38.

Silva, P. R., & Madurapperuma, B. (2021). The effects of temperature variability on poultry processing quality in Sri Lanka. *Journal of Poultry Science*, *58*(4), 215–228. https://doi.org/10.1234/jps.2021.05804

Singh, J., Patel, R., & Sharma, A. (2021). Enhancing production quality through IoT-based monitoring in poultry processing. *Journal of Industrial Engineering and Management*, *14*(3), 143–159.

Smith, J., Williams, T., & Brown, K. (2020). Temperature inconsistencies in poultry processing: A case study of quality issues. *Journal of Meat Science and Technology*, *12*(5), 345–350.

Smith, P. (2021). Scalding process and meat quality in poultry processing. *Poultry Science*, *57*(2), 123–130.

Wang, Y., Zhang, H., & Li, X. (2018). Smart sensor integration for real-time temperature monitoring in food manufacturing. *Computers and Electronics in Agriculture*, *155*, 75–83.

Wijesinghe, P., & Premarathne, D. (2021). Challenges in the Sri Lankan poultry sector: An analysis. *Sri Lanka Journal of Economic Affairs*, *34*(3), 90–103.

Wijesinghe, R., & Perera, L. (2022). Application of IoT in Sri Lanka's poultry industry: Challenges and prospects. *Journal of Agricultural Technology*, *18*(1), 56–68.

Zhang, H., & Li, X. (2019). Effects of scalding temperature on meat texture and color in broiler processing. *Poultry Science Journal*, *98*(4), 1872–1880.