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Organizational Challenges in Quality Assurance among Food Startups

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Abstract

This study explores the organizational challenges in quality assurance (QA) encountered by food startups operating within resource-constrained and rapidly evolving business environments. As consumer expectations for food safety and regulatory compliance intensify, startups face significant pressure to institutionalize effective QA systems. However, their informal structures, limited capital, and lack of specialized expertise often result in ad hoc quality practices that threaten operational integrity and customer trust. The objective of this research is to examine how internal organizational dynamics—such as leadership commitment, resource allocation, staff competencies, and learning capacity—affect QA implementation in food startups. Employing a qualitative methodology through literature-based analysis, the study systematically synthesizes academic articles, case studies, and regulatory reports to identify recurring themes and structural impediments. Findings reveal four major organizational challenges: weak quality culture and leadership, inadequate infrastructure and human resources, complex regulatory landscapes, and limited scalability of QA systems. These challenges are shown to interact in mutually reinforcing ways, exacerbating quality risks as startups grow. The study also uncovers a critical gap in quality learning mechanisms that prevents startups from evolving toward maturity. The results underscore the need for tailored QA frameworks and policy support to foster sustainable quality practices. The study contributes to the theoretical understanding of QA in emerging business contexts and offers managerial insights for founders, incubators, and regulators aiming to strengthen quality foundations in the food startup ecosystem.

Keywords: *Food Startups, Quality Assurance, Organizational Challenges, Compliance, Quality Culture.*

1. Introduction

In the contemporary landscape of global entrepreneurship, the food startup sector has emerged as a vibrant and rapidly evolving industry. This proliferation is driven by shifting consumer preferences toward artisanal, health-conscious, and locally sourced food products, coupled with increasing digital access to food delivery platforms and social commerce. Startups in the food industry are characterized by their agility, creativity, and ability to respond to niche markets, often differentiating themselves through innovation in product formulation, sustainable sourcing, or unique branding. Despite this dynamism, food startups face a daunting challenge: maintaining consistent quality assurance (QA) in environments that are often resource-constrained and operationally immature. Quality assurance, particularly in the food industry, is not merely a technical obligation but a strategic imperative. It encompasses all planned and systematic activities implemented within the quality system to provide confidence that a product will fulfill requirements for quality and safety. The food sector, more than many others, is subject to stringent regulations due to the

potential health risks posed by poor-quality or contaminated products. For large corporations with robust infrastructures, quality management systems (QMS) are deeply integrated into their operations. However, food startups frequently operate under conditions of limited capital, scarce expertise, and evolving organizational structures, rendering the implementation and maintenance of comprehensive QA systems especially challenging.

The challenges are not only operational but also organizational. As food startups transition from the ideation stage to commercial operations, they must establish internal systems, policies, and workflows that support consistent product quality. These include procedures for supplier verification, standard operating protocols for production, training systems for employees, and mechanisms for monitoring customer feedback and compliance with food safety regulations. In many cases, these systems are either underdeveloped or reactively implemented, resulting in inconsistent product quality, customer complaints, and difficulties in scaling operations. Moreover, the organizational culture within startups—which often prioritizes speed, flexibility, and minimal bureaucracy—can inadvertently undermine the discipline required for stringent quality assurance. At the heart of these challenges lies a fundamental tension between innovation and standardization. Food startups typically value experimentation and adaptability, which can be at odds with the structured, repeatable processes demanded by effective QA systems. This tension is exacerbated by a lack of formal managerial training among startup founders, many of whom come from culinary or creative backgrounds rather than operations or food safety disciplines. As a result, QA practices are often informal, ad hoc, or delegated to underqualified personnel, increasing the risk of lapses in quality control.

The organizational challenges facing food startups in quality assurance are not merely theoretical but have been widely reported in both academic literature and industry case studies. Prior research has highlighted various internal obstacles, such as insufficient leadership commitment to QA, unclear role definitions related to quality responsibilities, lack of standardized documentation, and limited staff training (Lee & Heo, 2020; Marimuthu et al., 2022). Additionally, studies indicate that startups often operate in a reactive mode, responding to quality problems after they occur rather than preventing them through proactive QA planning (Tang & Ding, 2019). These organizational deficiencies have significant implications not only for operational efficiency but also for regulatory compliance, brand reputation, and ultimately, business sustainability. The challenges are compounded in developing country contexts, where regulatory enforcement may be inconsistent, supply chains fragmented, and access to professional QA consultancy limited. In the Indonesian startup ecosystem, for instance, food startups face a dual burden: navigating the regulatory complexities imposed by agencies such as the National Agency of Drug and Food Control (BPOM) while simultaneously contending with internal capability constraints. Anecdotal evidence suggests that while many startups succeed in product innovation, they struggle to meet consistent QA benchmarks, leading to compromised customer trust and difficulty in achieving long-term viability.

Several previous studies have sought to analyze quality assurance in small and medium-sized enterprises (SMEs), but few have explicitly focused on the unique organizational context of food startups. Whereas SMEs may already have established departments and formal hierarchies, startups typically operate with flatter structures, fluid job descriptions, and evolving business models. This structural informality, while conducive to rapid growth and creativity, may hinder the implementation of robust QA protocols. Furthermore, the lack of institutional memory and historical data in new businesses complicates efforts to establish reliable quality baselines or trace root causes of recurring issues. From a research perspective, this study aims to fill a critical gap by focusing specifically on the organizational dimensions of QA challenges in the food startup context. Drawing on quantitative descriptive methods, this research investigates how internal organizational factors—such as leadership commitment, staff training, quality communication, and procedural standardization—impact the implementation and effectiveness of QA systems in food startups. The study is positioned within the broader discourse on quality management in entrepreneurial ventures, offering empirical insights into how nascent food businesses navigate the competing demands of innovation and compliance.

The relevance of this research is underscored by the increasing consumer and regulatory scrutiny on food safety and quality in emerging food markets. As customer expectations rise and regulatory bodies tighten standards, startups that fail to institutionalize quality assurance risk operational disruptions, reputational damage, and legal consequences. Conversely, those that succeed in embedding QA into their organizational fabric stand to gain competitive advantage, customer loyalty, and readiness for scale. The study, therefore, not only contributes to academic understanding but also holds practical significance for startup founders, accelerators, policy-makers, and food safety advocates. This study adopts a quantitative

descriptive methodology to provide a structured overview of the prevalent organizational challenges in QA as perceived by key actors within food startups. Through the use of structured questionnaires distributed among a representative sample of food startup personnel—including founders, operations managers, and quality control officers—the research seeks to identify patterns, frequencies, and correlations among various organizational variables. The quantitative approach allows for the measurement of QA-related challenges in a systematic manner, thereby enabling generalizations and policy recommendations grounded in empirical data.

The specific objectives of this study are threefold. First, it aims to identify the most common organizational challenges encountered by food startups in implementing quality assurance. This includes issues related to resource allocation, leadership commitment, staff competencies, and documentation practices. Second, the study seeks to explore the relationships among these organizational variables to understand how certain factors may amplify or mitigate QA challenges. Finally, it intends to provide actionable recommendations for food startup founders, incubators, and regulators to improve QA readiness and resilience in early-stage food enterprises. In summary, the intersection between organizational dynamics and quality assurance in food startups represents a critical yet underexplored domain. As the food startup ecosystem continues to grow in complexity and visibility, ensuring product quality through sound organizational practices becomes not only a matter of consumer protection but also a strategic differentiator. This research is situated at this intersection, aiming to contribute both to scholarly literature and practical efforts to foster a safer, more consistent, and scalable food startup sector. By examining the lived organizational realities of startups and quantifying the prevalence and impact of QA challenges, this study provides a timely and essential lens on one of the most pressing operational issues confronting new food enterprises today.

2. Literature Review

2.1. Quality Assurance in the Context of Food Startups

Quality assurance (QA) in the food industry is a comprehensive system designed to ensure that food products meet specified safety, regulatory, and consumer standards. QA encompasses systematic activities such as inspection, documentation, testing, and continuous monitoring to guarantee product quality throughout the production lifecycle (Becker & Smidt, 2016). In startups, particularly those operating in the food sector, these activities are often underdeveloped due to constraints in resources, expertise, and infrastructure. Unlike established corporations with dedicated quality departments, startups typically rely on ad hoc processes, which makes the implementation of robust QA systems challenging and inconsistent. The necessity of QA becomes especially critical in food startups due to the inherent risks associated with foodborne illnesses, contamination, and shelf-life variability. Regulatory bodies worldwide, including the FDA in the United States and BPOM in Indonesia, have implemented stringent food safety regulations to mitigate these risks (Henson & Caswell, 1999). However, adherence to such regulations can be particularly burdensome for startups, which may lack the capital or technical capacity to comply fully. Moreover, customer expectations for transparency and ethical production further pressure startups to develop credible QA frameworks even at early business stages.

Several empirical studies have noted the weak integration of QA systems in startups and SMEs. For example, Omachonu and Ross (2004) argue that small firms often treat QA as a compliance burden rather than a strategic asset. In the context of food startups, the absence of standardized operating procedures and formal QA policies significantly increases the risk of quality variance and reputational damage. The situation is further complicated by rapid product innovation cycles and limited market testing, which often precede comprehensive quality evaluations (Khatri et al., 2020). Given these conditions, many food startups attempt to balance innovation and QA by adopting simplified frameworks such as HACCP (Hazard Analysis and Critical Control Points) and ISO 22000 standards. However, even these simplified approaches require organizational discipline and technical proficiency that many startups lack (Trienekens & Zuurbier, 2008). Therefore, understanding the organizational impediments to QA in this context is essential for both academic inquiry and practical improvement.

2.2. Organizational Dynamics and Quality Culture

A core theme in literature on QA is the influence of organizational dynamics on quality implementation. Quality assurance is not merely a technical or operational process but is deeply embedded within organizational culture and leadership commitment. Studies by Powell (1995) and Sila & Ebrahimpour

(2005) show that the success of QA initiatives depends significantly on top management support, employee involvement, and a shared organizational vision for quality. This poses a particular challenge in startups, where roles are fluid, hierarchies are minimal, and the emphasis is typically placed on speed and innovation. Organizational culture in startups often leans toward informality and agility, which, while beneficial for rapid decision-making, can hinder the standardization required for QA (Bailey & Peck, 2013). Founders and managers may undervalue documentation, procedural adherence, and quality monitoring due to a lack of exposure to formal management systems. Consequently, QA responsibilities are either neglected or delegated to junior staff without adequate oversight, leading to inconsistency and systemic risk. This cultural aspect has been identified as a key barrier to QA adoption in many small and emerging food businesses (Taylor, 2001).

Additionally, organizational learning is a pivotal factor. QA is not a one-time effort but a dynamic process of continuous improvement. According to Garvin (1993), organizations that institutionalize quality learning cycles—through audits, feedback mechanisms, and root cause analysis—are more likely to sustain high quality. Startups, however, often operate with limited feedback loops and may lack the experience or data necessary to generate meaningful insights. This lack of institutional learning hampers their ability to respond effectively to recurring quality issues or prevent them proactively. Furthermore, the alignment between organizational goals and QA is frequently misaligned in food startups. Many such enterprises prioritize customer acquisition, product launches, and marketing over internal operational integrity. As noted by Prajogo and Sohal (2006), firms that integrate quality into their strategic objectives perform better in the long run. However, the strategic marginalization of QA in early-stage companies often results in reactive rather than preventive quality measures, weakening the startup's long-term resilience.

2.3. Resource Limitations and Structural Challenges

Resource constraints are arguably the most visible challenge facing food startups in their QA journey. Financial capital, human resources, and technical infrastructure are all foundational to establishing and maintaining quality systems. However, startups typically operate with minimal capital and lean staffing models, which limit their ability to invest in QA technologies, training, or dedicated personnel (Gupta & Kohli, 2006). As a result, QA is often subsumed under other functional roles, leading to compromised focus and execution. Lack of skilled labor is another prominent barrier. The implementation of QA standards requires not only operational discipline but also domain expertise in food safety, microbiology, or industrial engineering. Yet, many food startups employ generalists or inexperienced staff due to budgetary restrictions. As a consequence, the sophistication and reliability of QA processes suffer significantly. Empirical findings by Kafetzopoulos et al. (2013) demonstrate that training and staff competency are positively correlated with QA success, further highlighting the risks of underinvestment in human capital.

Additionally, documentation and standardization pose unique problems. QA systems rely heavily on accurate records, traceability, and repeatability of processes. In startups, where improvisation is common and processes are still evolving, maintaining up-to-date documentation can be both time-consuming and deprioritized (Smallbone et al., 2000). This absence of procedural clarity inhibits quality control, root cause diagnosis, and regulatory compliance. For food startups, the inability to provide adequate production records can result in failed audits or product recalls. From an infrastructure perspective, startups often lack dedicated space and technology for quality testing, storage, or environmental control. For instance, maintaining cold chains, calibrating machinery, or conducting microbial tests may be beyond the operational reach of small food enterprises. In contrast, larger firms have access to internal laboratories or third-party QA services. This infrastructural gap creates an uneven playing field, where startups must operate under high QA expectations without the means to meet them (Manzini & Accorsi, 2013).

2.4. Regulatory and Market Pressures

Regulatory compliance is a non-negotiable element of QA, particularly in the food sector. Governments around the world have instituted frameworks to ensure public safety, including labeling laws, ingredient disclosures, and hygiene standards. For food startups, understanding and complying with these regulations can be daunting, especially when laws are technical or subject to frequent change. As noted by Henson and Heasman (1998), the regulatory burden disproportionately affects smaller firms, which often lack in-house legal or regulatory experts. In the Indonesian context, regulatory oversight by BPOM and Halal certification agencies adds another layer of complexity for food startups. Anecdotal evidence and case studies suggest that many startups delay formal certification processes due to procedural complexity and

associated costs (Winarno & Allain, 1991). This delay not only exposes them to legal risk but also restricts access to broader markets, such as modern retailers or export channels that require certified QA protocols. Market dynamics also influence QA practices. With growing consumer awareness around food safety, ethical sourcing, and traceability, startups are under pressure to provide high-quality, transparent products. Failure to meet these expectations can lead to negative reviews, social media backlash, or consumer attrition. Conversely, startups that invest in QA early may build stronger brand equity and customer loyalty (Luning et al., 2002). Thus, market expectations are increasingly aligned with QA excellence, raising the stakes for compliance and performance. Finally, global food supply chains add additional complexity. Startups sourcing ingredients internationally must navigate variable quality standards, customs requirements, and logistical risks. Disruptions in the supply chain or inconsistencies in raw material quality can cascade into downstream QA issues. In such volatile environments, the lack of robust internal QA systems further compounds the risks (Soman et al., 2004). Therefore, regulatory and market forces are external drivers that both challenge and incentivize improved QA in food startups.

3. Research Methodology

This research adopts a qualitative methodology anchored in an extensive literature-based analysis to explore organizational challenges in quality assurance (QA) among food startups. A qualitative approach is particularly appropriate for this study, as it enables the researcher to uncover patterns, meanings, and organizational behaviors that may not be easily quantifiable but are deeply embedded within the lived realities and institutional cultures of early-stage food enterprises. By utilizing a non-empirical but analytically rigorous synthesis of existing scholarly works, reports, and theoretical perspectives, this study aims to construct a conceptual framework that reflects the key organizational barriers to QA implementation in food startups. The research design is structured to align with the goals of interpretive inquiry, which emphasizes the understanding of human actions and organizational processes within their social, cultural, and economic contexts. Unlike experimental or statistical designs, the qualitative literature-based method employed here does not seek to generalize findings through numerical inference but instead to develop a layered and nuanced understanding of phenomena through the systematic review and interpretation of existing knowledge. This approach is grounded in the epistemological stance that knowledge is constructed through discourse, context, and interpretation, rather than mere observation.

To ensure methodological rigor, the research was guided by principles of qualitative synthesis, specifically drawing from techniques associated with narrative synthesis and thematic analysis. The process began with the identification and selection of relevant literature. A systematic search strategy was employed to gather academic journal articles, industry white papers, policy reports, and credible case studies published between 2000 and 2024. The databases used for this search included Scopus, Web of Science, ScienceDirect, and Google Scholar. Search terms were formulated based on three core thematic areas: (1) quality assurance in the food sector, (2) organizational dynamics in startups or SMEs, and (3) food startup management and operational practices. Boolean operators and controlled vocabulary such as “AND,” “OR,” and “organizational culture,” “quality control,” “startup,” and “food industry” were used to refine results. The inclusion criteria for literature selection were clearly defined to ensure relevance and credibility. Only peer-reviewed articles, government reports, and academic books that explicitly discussed either QA implementation in the food sector or organizational challenges in startups were included. Sources that lacked theoretical or empirical depth or that focused solely on large multinational corporations without reference to startup conditions were excluded. This resulted in a curated corpus of approximately 60 primary sources, which were then subjected to full-text reading and inductive thematic coding.

The thematic analysis process was conducted manually and supported by qualitative coding software (e.g., NVivo), allowing the identification of recurring patterns, constructs, and arguments across diverse sources. Each source was analyzed to extract data regarding organizational behaviors, leadership practices, quality protocols, employee training, resource allocation, and regulatory interaction in the context of QA. These extracted themes were then grouped into higher-order categories to reveal broader organizational trends. This inductive method enabled the researcher to identify not only explicit organizational challenges but also implicit tensions and trade-offs inherent in startup environments. In parallel, a narrative synthesis framework was employed to structure and integrate the themes identified. Narrative synthesis facilitates the development of a coherent storyline across different studies by contextualizing findings within a broader conceptual map. Rather than aggregating data, this method emphasizes interpretation, comparison, and explanation. It allows the researcher to trace how particular organizational problems are discussed across

different academic traditions—such as operations management, organizational theory, food science, and entrepreneurship—and how these discourses converge or diverge in their explanations. In doing so, the study can create a multidimensional picture of the organizational barriers to QA in food startups.

Importantly, this research also recognizes the value of theoretical triangulation as a methodological tool. The organizational challenges identified in the literature were interpreted through multiple theoretical lenses, including total quality management (TQM), institutional theory, and resource-based view (RBV). For instance, the emphasis on leadership commitment and employee involvement was interpreted through the TQM lens, which posits that quality is a function of organizational commitment at all levels. Meanwhile, the influence of external regulations and norms was examined through the lens of institutional theory, which suggests that startups adapt to environmental pressures not solely based on efficiency but also on legitimacy-seeking behavior. Finally, constraints such as limited capital and expertise were analyzed within the RBV framework, which argues that organizational performance is rooted in the possession and strategic deployment of valuable resources.

The integration of these theoretical frameworks enhances the depth of analysis and provides a more comprehensive understanding of the factors that inhibit effective QA in food startups. Moreover, by drawing on diverse academic traditions, this research avoids the epistemological limitation of single-theory analysis and instead embraces the complexity of real-world organizational phenomena. This theoretical pluralism is further supported by cross-sectoral case studies included in the literature review, which provide practical insights from food startups operating in various geographical and regulatory contexts. Given that this study is literature-based, its validity is contingent upon the comprehensiveness of the literature reviewed and the robustness of its interpretative logic. To address potential limitations, the study adhered to the principles of transparency and reflexivity in qualitative research. All literature selection steps, coding decisions, and thematic categorizations were documented and iteratively refined. The researcher continuously engaged in reflexive questioning to mitigate confirmation bias and to remain open to unexpected findings that challenged initial assumptions. For instance, while the initial hypothesis emphasized lack of capital as the principal QA barrier, thematic analysis revealed that organizational culture and leadership often played a more pivotal role than anticipated.

Furthermore, the study paid careful attention to contextual variations in the literature. Differences in startup ecosystems, such as those between developed and developing countries, or between urban and rural areas, were noted and factored into the analysis. This contextual sensitivity ensures that the findings are not overly generalized but are instead interpreted within the diversity of startup realities. For example, regulatory stringency and infrastructural availability in Indonesia differ markedly from those in Western Europe or North America, which may lead to different expressions of the same organizational challenge. While the study does not employ primary data collection such as interviews or field observations, its methodological strength lies in its capacity to synthesize and interpret a broad body of knowledge. By organizing diverse insights into a coherent analytical framework, the research contributes to theory-building in the area of startup quality management. It also provides a conceptual foundation for future empirical research that may wish to validate or expand upon the identified themes using field-based methods.

In terms of ethical considerations, this research adheres to academic standards of citation, source acknowledgment, and integrity. Since no human participants were involved, issues such as consent, confidentiality, or data protection were not applicable. Nevertheless, ethical rigor was maintained in the fair representation of scholarly arguments and the avoidance of misinterpretation or selective quoting. The qualitative literature-based research methodology employed in this study offers a rich and interpretative understanding of the organizational challenges that hinder quality assurance in food startups. By systematically reviewing and analyzing existing scholarly works and by interpreting them through multiple theoretical lenses, the study constructs a multidimensional framework that elucidates both overt and subtle organizational dynamics. This methodological approach is not only suitable for the study's exploratory aims but also aligns with the need to generate foundational knowledge in a relatively under-researched domain. As such, the research serves as a springboard for both theoretical advancement and practical inquiry into how food startups can overcome internal barriers to achieving quality excellence.

4. Results and Discussion

The exploration of organizational challenges in quality assurance (QA) among food startups reveals a complex interplay of internal dynamics, contextual constraints, and evolving external expectations. Through the synthesis of existing literature, this study identified several recurring themes that shed light on the

obstacles food startups face when attempting to institutionalize QA systems. The findings demonstrate that QA failures in startups are rarely caused by singular operational gaps; rather, they stem from systemic organizational weaknesses that influence decision-making, resource prioritization, staff capability, and adaptability to regulatory environments. This section discusses four core findings derived from the literature: (1) leadership and quality culture deficits, (2) resource and infrastructure limitations, (3) regulatory and compliance complexity, and (4) learning capacity and scalability barriers. Each of these dimensions will be explored to not only reflect current challenges but also to propose trajectories for future studies that support the long-term sustainability of food startups through enhanced QA frameworks.

4.1. Leadership Commitment and Quality Culture Deficits

One of the most dominant themes in the literature is the lack of strong leadership commitment toward building a culture of quality within food startups. Founders and early leadership teams in startups often focus their energy on product development, market penetration, and funding acquisition, leaving QA as a peripheral concern. This deprioritization is reflected in minimal strategic planning for QA, low resource allocation, and a lack of systematic communication regarding quality expectations. Research indicates that without top-down commitment, QA cannot be integrated into the startup's organizational identity, and instead remains a reactive, compliance-driven effort (Sila & Ebrahimipour, 2005; Powell, 1995). This weak quality culture also manifests in ambiguous role definitions and the absence of clear accountability structures for quality control tasks. In startups with flat hierarchies, multiple employees often share overlapping responsibilities without specialized roles, resulting in inconsistent QA practices. Moreover, there is often an overreliance on informal knowledge transfer and unwritten standards, which undermines the reliability of quality processes, especially during periods of staff turnover or business scaling (Taylor, 2001). These issues are not only operational but cultural, as they reflect an organization-wide mindset where quality is perceived as an obstacle to speed rather than a component of value creation.

Furthermore, the leadership's lack of QA literacy exacerbates these problems. Many startup founders emerge from culinary, marketing, or tech backgrounds with limited exposure to quality assurance principles rooted in food safety science or industrial engineering. Without a foundational understanding of the implications of substandard quality—ranging from customer health risks to regulatory sanctions—leaders may fail to initiate preventive systems, conduct regular audits, or invest in training. As noted by Garvin (1993), organizations that successfully embed quality as a core cultural value exhibit leadership behaviors that not only fund but also advocate and model quality behaviors. To move beyond this impasse, future research can focus on developing leadership intervention models specific to early-stage food enterprises. These could include modular QA training programs for founders, mentorship frameworks linking startups with seasoned QA professionals, and policy incentives for startups that demonstrate documented quality leadership. Such models would support sustainable quality cultures and help shift startup mindsets from reactive compliance to proactive excellence.

4.2. Resource and Infrastructure Constraints

A second critical challenge found in the literature is the lack of adequate resources and physical infrastructure to support QA implementation in food startups. Many early-stage companies operate on limited capital, working from shared kitchens, temporary facilities, or co-manufacturing spaces. These environments, while cost-effective, may not offer the spatial, environmental, or logistical features necessary for consistent quality monitoring. For instance, temperature-controlled storage, microbial testing labs, or dedicated QA workstations are often absent in such setups (Manzini & Accorsi, 2013). Additionally, the human resource deficit significantly impacts QA reliability. Food startups often rely on generalist staff, interns, or freelance workers, none of whom are formally trained in food safety or QA protocols. The literature highlights a strong correlation between employee competency and QA performance (Kafetzopoulos et al., 2013). Without trained QA personnel, essential procedures such as HACCP implementation, root cause analysis, or traceability audits are either neglected or executed improperly, increasing the risk of contamination, recall, or customer dissatisfaction.

Resource limitations also hinder the adoption of technology-based QA solutions. While digital QA systems—such as real-time monitoring software, traceability platforms, or automated compliance dashboards—are becoming more accessible, many startups cannot afford these tools due to initial investment costs or technical onboarding challenges. As a result, QA processes remain manual and error-prone, lacking documentation trails necessary for audit readiness or performance tracking (Gupta & Kohli, 2006). This creates a vicious cycle where lack of investment leads to operational weaknesses that then inhibit

access to larger funding or retail partnerships. To address these infrastructure-related challenges, the literature suggests the value of collective resource models such as food startup incubators equipped with shared QA facilities and centralized testing labs. Additionally, government subsidies or public-private partnerships could support the digital transformation of QA in early-stage food businesses. Future studies should investigate the effectiveness of such collaborative models, exploring how infrastructure sharing affects QA outcomes and startup longevity in various regional contexts.

4.3. Regulatory Complexity and Compliance Challenges

The third major finding from the literature relates to the difficulty food startups face in navigating the complex regulatory landscape governing food production and safety. Compliance with food safety regulations is a non-negotiable aspect of QA, yet it is also one of the most burdensome for resource-constrained startups. Regulatory frameworks are often rigid, technical, and bureaucratically intensive, demanding precise documentation, labeling, traceability, and reporting standards. In countries like Indonesia, obtaining licenses from BPOM, halal certifications, or hygiene permits can take months and require documentation that many startups are ill-prepared to produce (Henson & Caswell, 1999). This regulatory complexity creates both compliance risk and business constraints. Startups that delay registration or certification often remain excluded from formal distribution channels, including modern retail, export markets, and online platforms that mandate traceability. Conversely, those that attempt to comply without adequate internal QA systems risk audit failure or reputational damage. The literature also identifies inconsistencies between local government requirements and national food safety standards, adding further confusion for startups operating in decentralized regulatory environments (Winarno & Allain, 1991).

Moreover, the interpretive flexibility of certain regulations—such as defining “ready-to-eat,” “organic,” or “preservative-free”—can lead to operational ambiguity. Without dedicated regulatory advisors or QA consultants, startups may misinterpret guidelines, leading to unintended violations or branding issues. This not only affects product quality but also customer trust, especially in the era of transparency and ethical consumption (Luning et al., 2002). To build regulatory resilience, future research could examine how digital regulatory technologies (RegTech) and automated compliance systems can support food startups in low-resource contexts. Additionally, case studies on countries that have successfully implemented startup-friendly food safety reforms would offer comparative insights for emerging economies. A sustained academic focus on the interface between regulatory policy and startup capability would strengthen advocacy for scalable, risk-based regulatory frameworks tailored to early-stage businesses.

4.4. Learning Capacity and Scalability of QA Systems

The final challenge concerns the limited organizational learning capacity within food startups, which hampers the scalability of QA systems. Many startups operate with limited historical data, informal knowledge transfer mechanisms, and high staff turnover. These conditions prevent the formation of institutional memory, making it difficult for QA processes to evolve or adapt over time. Moreover, startups often lack the feedback mechanisms—such as customer complaint systems, internal audits, or supplier performance reviews—that are critical for quality learning cycles (Garvin, 1993). The inability to learn from past quality failures or customer feedback leads to repeated errors, inefficient resource use, and stunted operational maturity. As startups begin to scale, these vulnerabilities become more pronounced. Increased production volumes, expanded distribution, and new product variants multiply the complexity of QA management. Without scalable systems for documentation, quality control, and process standardization, startups are at risk of quality dilution or systemic failure during growth phases (Trienekens & Zuurbier, 2008).

Furthermore, the literature points to a lack of mentorship or knowledge-sharing platforms tailored to QA in the food startup ecosystem. While accelerators and incubators offer support in marketing or fundraising, few provide structured guidance on quality systems or operational scalability. This leaves a vacuum where startups must learn QA through trial and error, often at great cost. To address this, there is a need for longitudinal studies that follow the QA trajectories of startups over multiple growth stages, identifying key inflection points and failure patterns. In the long run, embedding learning mechanisms—such as post-launch reviews, QA-focused key performance indicators (KPIs), and organizational self-assessments—could serve as early warning systems and continuous improvement tools. Future research should explore how digital twins, process simulations, or lean QA frameworks can help food startups simulate and adapt QA systems as they grow. Such tools would not only enhance startup survivability but also contribute to the professionalization of the emerging food sector.

5. Conclusion

The findings of this literature-based qualitative study underscore the multifaceted nature of organizational challenges in quality assurance (QA) among food startups. Far from being isolated technical issues, QA deficiencies are deeply rooted in broader organizational dynamics, including leadership behavior, cultural attitudes, resource scarcity, regulatory navigation, and learning capacity. Food startups often operate within turbulent environments that emphasize product innovation and rapid market entry, yet these ambitions are rarely matched with proportional investments in systematic QA frameworks. The absence of strong leadership commitment, formalized quality protocols, and skilled personnel collectively hinders the establishment of a quality-driven culture. As a result, QA is frequently marginalized as a reactive function, rather than integrated into the strategic foundation of the enterprise. The literature also demonstrates that regulatory complexity, infrastructural limitations, and lack of institutional learning mechanisms further aggravate these challenges, making the pursuit of consistent product quality both operationally and strategically precarious for emerging food enterprises.

From a theoretical standpoint, this study contributes to a more integrated understanding of quality assurance in startup ecosystems by synthesizing perspectives from total quality management (TQM), institutional theory, and the resource-based view (RBV). It extends the discourse on QA by shifting attention from mature firms and industrial-scale operations to the startup context, where traditional models of quality implementation often fall short. The study highlights the need for adapted QA frameworks that are not only technically sound but also culturally compatible with the informal and agile nature of startups. It also emphasizes the value of a multidisciplinary lens in assessing QA performance, recognizing that effective quality management in startups cannot be disentangled from leadership psychology, organizational learning, and environmental uncertainty. Future research grounded in longitudinal or comparative methods could further test and refine these theoretical insights, particularly by examining how different startup trajectories influence the institutionalization of quality practices over time.

Managerially, the implications of this research are significant. Founders and startup teams must begin to view QA not as a post-hoc operational burden, but as a strategic asset that contributes to product credibility, consumer trust, and long-term viability. Policymakers and incubators should prioritize QA readiness as a key component of startup support programs, offering targeted training, shared infrastructure, and mentorship in quality management systems. Investors and stakeholders must also consider QA maturity as a critical indicator of a startup's scalability and sustainability. By embedding QA into the organizational DNA of food startups—through leadership development, resource planning, compliance innovation, and continuous improvement systems—these enterprises can better navigate their growth journeys while ensuring the integrity of their products. In doing so, food startups will not only protect consumer well-being but also enhance their competitive advantage in an increasingly quality-conscious market.

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