

LEADERSHIP AND FOOD SAFETY CULTURE: THE ROLE OF MANAGEMENT IN STRENGTHENING FOOD SAFETY PERFORMANCE

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Abstract: Food safety culture has become a central component of modern food safety management systems, reflecting the growing recognition that food safety depends not only on technical controls and regulatory compliance but also on organizational values, attitudes, and behaviours that influence food safety performance. A positive food safety culture influences how individuals perceive, prioritize, and implement food safety practices in their daily work. Among the various factors contributing to the development of food safety culture, leadership and management commitment are widely recognized as critical drivers of organizational success. The aim of this paper is to examine the role of management and leadership in developing and maintaining a positive food safety culture within food organizations. Particular attention is given to managerial commitment, communication practices, staff training, employee engagement, decision-making processes, and the creation of an environment that supports continuous improvement. The paper also explores how leadership behaviours influence employee motivation, compliance with food safety procedures, and overall organizational performance. This review article is based on an analysis of relevant scientific and professional literature addressing food safety culture, organizational leadership, management commitment, and food safety management systems. A narrative review approach was applied to identify, analyse, and synthesize key findings related to leadership practices, management commitment, and their contribution to food safety culture development. Emphasis was placed on studies examining the interaction between management practices and employee behaviour, as well as research focusing on factors that support or hinder the successful implementation of food safety initiatives. The findings indicate that management commitment is a prerequisite for the successful development of food safety culture. Leaders who actively demonstrate their dedication to food safety through communication, training, resource allocation, and employee support contribute to greater staff engagement and improved compliance with food safety requirements. Conversely, inadequate leadership, poor communication, limited employee involvement, and insufficient organizational support may weaken food safety culture and increase the likelihood of unsafe practices. The review highlights the importance of leadership-driven approaches that encourage shared responsibility, trust, and continuous learning. Strengthening management commitment and integrating food safety values into organizational strategies are essential for improving food safety performance, protecting public health, and ensuring the long-term effectiveness of food safety management systems.

Keywords: food safety culture, leadership, management commitment, food safety management, employee engagement.

1. INTRODUCTION

According to the World Health Organization (WHO, 2022), food safety remains a major public health challenge despite continuous advances in food production technologies, improvements in regulatory frameworks, and the implementation of modern food safety management systems. Foodborne diseases continue to represent a significant source of morbidity and economic losses worldwide. Additional challenges include the globalization of food supply chains, increased international trade in food and animals, changing dietary and lifestyle habits, climate change, and the emergence of new biological, chemical, and physical hazards, all of which require a comprehensive approach to food safety management throughout the food chain, from farm to fork (Lake et al., 2026; WHO, 2026). Food safety management relies on the implementation of standardized technical and organizational measures, including Good Manufacturing Practices (GMP), Good Hygiene Practices (GHP), and

the Hazard Analysis and Critical Control Point (HACCP) system. These tools form the foundation of modern food safety risk management by enabling systematic identification, assessment, and control of hazards throughout the food chain. However, their effectiveness depends on consistent implementation, continuous monitoring, and regular verification of established control measures (European Parliament & Council of the European Union, 2004; FAO, 2023). Numerous food recalls and foodborne disease outbreaks have highlighted that the formal implementation and certification of food safety management systems do not guarantee complete prevention of food safety incidents. Growing evidence suggests that the effectiveness of technical control measures is strongly influenced by organizational culture, employee behaviour, and management commitment to food safety (Griffith et al., 2010; FDA, 2024; Forte et al., 2024). In response to the need for more effective food safety risk management, the concept of Food Safety Culture (FSC) has gained increasing attention and is now regarded as a key determinant of food safety management system performance (Pai et al., 2024). Early work by Griffith et al. (2010) emphasized the importance of shared values, beliefs, and employee behaviours in ensuring food safety. Subsequent definitions proposed by the Global Food Safety Initiative (GFSI, 2018) and Sharman et al. (2020) further characterized FSC as a set of shared values, beliefs, behaviours, and assumptions that collectively influence organizational food safety performance. A major milestone in the evolution of food safety culture was the 2020 revision of the Codex Alimentarius General Principles of Food Hygiene (CXC 1-1969), which formally incorporated food safety culture as an integral component of food safety management systems. The revised principles emphasize that management and leadership must demonstrate a strong commitment to food safety, promote appropriate values and behaviours, and foster an organizational environment that supports accountability, open communication, and continuous improvement. The Codex framework recognizes that the effectiveness of HACCP systems and other preventive controls depends not only on technical measures but also on the values, attitudes, competencies, and behaviours of employees at all organizational levels. Consequently, food safety culture became an internationally recognized element of good hygiene practices and a prerequisite for effective food safety management (Codex Alimentarius Commission, 2020). The most recent definition proposed by GFSI (2026) describes FSC as a concept based on deeply rooted beliefs, values, behaviours, and assumptions shared by employees that influence organizational food safety performance. The GFSI framework identifies leadership commitment, communication, accountability, employee empowerment, education and training, and continuous improvement as its core dimensions (GFSI, 2026). The growing interest in food safety culture reflects increasing recognition that the effectiveness of food safety management systems depends not only on technical controls and regulatory requirements but also on the human dimension of organizational performance. Organizations characterized by a strong food safety culture demonstrate greater employee commitment, more consistent compliance with food safety procedures, and enhanced food safety performance (Kramer et al., 2023; Spagnoli et al., 2024). Leadership and management commitment are widely recognized as the primary drivers of food safety culture development and sustainability. By establishing priorities, allocating resources, and shaping organizational expectations, leaders play a pivotal role in fostering a culture that supports food safety. Employees often perceive the true importance of food safety through management actions rather than through formal policies and procedures alone (Griffith et al., 2010; Jespersen et al., 2016). Effective leadership, adequate resource allocation, continuous employee training, and open communication are critical for strengthening food safety culture and improving food safety management system performance (Spagnoli et al., 2024; De Boeck et al., 2015; Boutros & Roberts, 2023). Nevertheless, the successful implementation of food safety culture remains influenced by organizational, economic, and social factors, resulting in considerable variation across countries, industry sectors, and food businesses (Pai et al., 2024). Therefore, further understanding of the factors that support the establishment and maintenance of food safety culture is needed. This review aims to critically examine the role of management and leadership in developing and sustaining a positive food safety culture and their contribution to enhanced food safety performance.

2. MATERIALS AND METHODS

This paper represents a narrative literature review focusing on food safety culture, leadership, and management commitment in food safety management systems. Relevant literature was identified through searches of scientific databases using keywords such as *food safety culture*, *leadership*, *management commitment*, *food safety management systems*, and *employee engagement*. Priority was given to peer-reviewed articles, international standards, and guidance documents published during the last decade. The selected literature was critically analysed and synthesised to identify the main leadership-related factors influencing the development and sustainability of food safety culture.

3. RESULTS AND DISCUSSION

Leadership and Management Commitment as Key Drivers of Food Safety Culture

The literature consistently identifies leadership as a central determinant of food safety culture maturity within food organisations. While food safety management systems provide the technical framework for hazard control

through formal procedures, standards, and monitoring activities, leadership shapes the organizational context in which these systems are implemented and sustained. Consequently, employees' perceptions of the importance of food safety are often influenced more by managerial actions and priorities than by documented procedures alone. Available evidence indicates that organizations characterized by strong managerial involvement generally achieve higher levels of employee engagement, compliance with food safety practices, and overall food safety performance. In a comparative study of dairy companies in Zimbabwe, Nyarugwe et al. (2018) reported that organizations demonstrating greater management commitment exhibited more positive employee behaviours and more mature food safety cultures. Their findings suggest that differences in food safety culture maturity cannot be explained solely by the technical characteristics of food safety management systems but are also strongly influenced by the extent to which management promotes food safety as a core organizational value. Similarly, Jespersen et al. (2016) emphasized the central role of leadership in shaping food safety culture through the establishment of clear expectations, consistent communication, and active managerial support for food safety initiatives. The authors argued that leadership influences organizational culture not only through strategic decision-making but also through the continuous demonstration of values and priorities that guide employee behaviour. This perspective reinforces the view that food safety culture is embedded within broader organizational processes and depends heavily on leaders' ability to translate food safety objectives into everyday practices. Recent research further highlights the importance of leadership-related organizational factors in determining food safety culture maturity. A large-scale study involving 1,410 employees from 20 food companies identified leadership, communication, resource availability, and organizational commitment as among the strongest predictors of a positive food safety culture (Spagnoli et al., 2024). Notably, significant differences were observed between managerial and operational employees in their perceptions of food safety culture, suggesting the need for greater alignment of food safety priorities and expectations across organizational levels. Beyond influencing employee behaviour, leadership plays a critical role in providing the resources necessary for effective food safety management. Pai et al. (2024) emphasized that sustained improvement of food safety culture requires visible and continuous management support through investments in employee training, competency development, communication systems, and organizational structures that encourage accountability and engagement. Furthermore, transformational leadership has been associated with higher employee motivation, stronger commitment to food safety objectives, and a more proactive approach to risk management. Leadership also contributes significantly to organizational resilience and adaptive capacity. Nyarugwe et al. (2016) identified leadership, communication, management commitment, and employee training as core determinants of food safety culture that enhance an organization's ability to respond effectively to emerging hazards, operational challenges, and changing regulatory requirements. Organizations that foster shared values, open communication, and continuous learning are more likely to achieve sustained improvements in food safety performance and the successful implementation of food safety management systems. Collectively, the findings reviewed in this study suggest that leadership should be viewed not merely as a formal organizational function, but as a strategic mechanism through which organizational values, priorities, and behavioural norms are established and reinforced. Although food safety management systems provide the technical infrastructure required for risk control, their effectiveness ultimately depends on management commitment and leaders' ability to embed food safety principles into everyday organizational practices. Consequently, leadership remains one of the strongest predictors of the successful development, implementation, and long-term sustainability of food safety culture within food businesses.

Communication, Training, and Employee Empowerment as Key Drivers of Food Safety Culture

The successful development and implementation of food safety culture depend heavily on effective communication between management and employees. Communication serves as a critical mechanism through which food safety values, expectations, and responsibilities are transmitted, reinforced, and embedded within an organization. Its importance is particularly pronounced in large food manufacturing enterprises, where complex organizational structures, multiple hierarchical levels, and cross-functional operations require the continuous exchange of information among management, quality assurance teams, production personnel, maintenance departments, logistics units, and human resources. Information related to food safety risks, non-conformities, corrective actions, procedural changes, and regulatory requirements must be communicated clearly and in a timely manner to ensure the consistent implementation of food safety controls throughout the organization. Effective communication facilitates coordination, reduces the likelihood of operational errors, and promotes a shared understanding of food safety objectives among employees. Conversely, communication failures may result in the misinterpretation of procedures, inadequate risk management, and an increased likelihood of food safety incidents (Pai et al., 2024; Nyarugwe et al., 2018; Sharman et al., 2020). Although communication challenges are often more visible in large food companies, effective communication is equally important in micro, small, and medium-sized food businesses. In smaller organizations, such as restaurants, bakeries, confectionery businesses, and family-owned production facilities, formal organizational structures may be less developed. Nevertheless, the limited number of employees and resources makes it essential that food safety-related information is communicated clearly and consistently across the workforce. In such settings, direct

interaction between owners, managers, and employees frequently represents the primary mechanism for ensuring compliance with hygiene standards, Good Manufacturing Practices, and HACCP procedures. Previous studies have demonstrated that open communication and active employee involvement contribute to higher levels of accountability, increased motivation, and a greater willingness to report potential food safety concerns, all of which are recognized characteristics of a mature food safety culture (Jespersen et al., 2016; Spagnoli et al., 2024). Training and education constitute another fundamental component of food safety culture. Regulation (EC) No. 852/2004 requires that food handlers receive appropriate supervision and training relevant to their duties, while personnel responsible for the development and maintenance of HACCP systems must possess adequate knowledge of HACCP principles. However, European legislation does not prescribe mandatory intervals for refresher training, leaving food business operators responsible for assessing training needs and ensuring ongoing competence development. Consistent with the HACCP philosophy, employee training should not be viewed as a one-time activity conducted upon recruitment, but rather as a continuous process that evolves alongside organizational development and changes in the operational environment. The need for additional training becomes particularly important when new technologies, production equipment, digital monitoring systems, automation processes, raw materials, or product formulations are introduced. Likewise, training should be reinforced following regulatory changes, HACCP plan revisions, the identification of emerging hazards, the occurrence of non-conformities, or the completion of internal and external audits. Such an approach ensures that employee competencies remain aligned with the current requirements of food safety management systems and emerging challenges within the food sector (ISO, 2018; Zanin et al., 2017). A growing body of research indicates that continuous, targeted, and job-specific training significantly improves employees' knowledge, attitudes, and behaviours, thereby enhancing compliance with hygiene and food safety requirements. Well-trained and empowered employees are more likely to report non-conformities, propose corrective actions, and assume personal responsibility for product safety, behaviours that are widely recognized as indicators of a mature food safety culture (da Cunha et al., 2014; da Vitória et al., 2021). Consequently, employee empowerment has emerged as an essential dimension of food safety culture, reflecting an organizational environment in which individuals are encouraged to actively participate in food safety decision-making processes and contribute to continuous improvement initiatives. In addition to operational staff, the continuous education of supervisors and managers is equally important. Management's understanding of food safety risks, commitment to food safety objectives, and ability to communicate expectations directly influence employee behaviour and the overall development of organizational culture. Research has consistently shown that organizations in which management actively participates in training activities, promotes food safety values, and provides the resources necessary for implementation achieve higher levels of food safety culture maturity, stronger employee engagement, and lower rates of non-conformity (Jespersen et al., 2016; Nyarugwe et al., 2018; Pai et al., 2024). Therefore, training should be regarded as a continuous and organization-wide process encompassing all hierarchical levels, from frontline workers to senior management. Contemporary food systems face numerous challenges, including market globalization, climate change, food chain digitalization, sustainability requirements, and increasing consumer expectations regarding transparency and product quality. These developments require food organizations to continuously invest in workforce knowledge and competencies to effectively identify emerging risks and adapt existing food safety management systems. Beyond improving technical knowledge, training supports the development of positive attitudes, responsible behaviours, and a proactive approach to risk management. These characteristics are fundamental attributes of a strong food safety culture and play a crucial role in enhancing the long-term effectiveness and resilience of food safety management systems (De Boeck et al., 2015; Kramer et al., 2023).

Barriers and Enabling Factors in the Implementation of Food Safety Culture

The successful implementation and long-term sustainability of food safety culture are shaped by multiple individual, organizational, and external factors. While several organizational characteristics facilitate the development of a positive food safety culture, various structural, behavioural, and resource-related barriers may impede its effective implementation. A synthesis of the scientific literature highlights a range of factors that either promote or hinder the integration of food safety culture within food businesses. The most commonly identified drivers and barriers are presented in Table 1.

Table 1. Key Barriers and Enabling Factors Influencing the Successful Implementation of Food Safety Culture

Barrier / Enabling Factors	Influence on Food Safety Culture	Key References
INDIVIDUAL FACTORS		
Barrier: Insufficient employee knowledge and competencies	Limited understanding of food safety hazards, HACCP principles, and hygiene procedures may result in inappropriate behaviours and an increased risk of non-conformities.	(da Cunha et al., 2014; De Boeck et al., 2015; da Vitória et al., 2021)

Enabling Factor: Continuous employee training/education	Continuous training enhances employees' knowledge, attitudes, and behaviours and contributes to the more consistent implementation of food safety practices.	(da Cunha et al., 2014; da Vitória et al., 2021)
Enabling Factor: Employee empowerment and engagement	Active employee involvement increases accountability, motivation, and willingness to report potential food safety issues.	(Jespersen et al., 2016; Spagnoli et al., 2024)
ORGANIZATIONAL FACTORS		
Barrier: Insufficient management commitment	The absence of visible leadership and managerial support reduces the perceived importance of food safety within the organization.	(Jespersen et al., 2016; Nyarugwe et al., 2018)
Barrier: Limited human and financial resources	Resource constraints hinder the implementation of training programmes, monitoring activities, and continuous improvement initiatives.	(Nyarugwe et al., 2018) (Pai et al., 2024)
Barrier: Poor internal communication	Ineffective information flow impedes knowledge transfer, the reporting of non-conformities, and timely risk management.	(Sharman et al., 2020; Nyarugwe et al., 2020)
Barrier: Prioritisation of productivity over food safety	An excessive focus on production targets may undermine food safety priorities and reduce compliance with established procedures.	(Nyarugwe et al., 2018; Pai et al., 2024)
Enabling Factor: Visible management leadership	Active managerial involvement contributes to the development of shared values and strengthens organizational commitment to food safety.	(Jespersen et al., 2016; Pai et al., 2024)
Enabling Factor: Open and two-way communication	Encourages organizational learning, transparency, and timely responses to food safety risks.	(Sharman et al., 2020; GFSI, 2026)
Enabling Factor: Continuous monitoring and assessment of food safety culture	Enables the identification of weaknesses and supports targeted improvement actions.	(Jespersen et al., 2016; Nyarugwe & Jespersen, 2024)
Enabling Factor: Error-reporting and organizational learning culture (Just Culture)	Encourages the reporting of non-conformities and learning from mistakes without fear of unjust blame or punishment.	(Wiśniewska, 2023)
EXTERNAL / REGULATORY FACTORS		
Barrier: Dynamic regulatory and technological changes	Require continuous adaptation of food safety management systems and ongoing development of employee competencies.	(ISO 22000, 2018; GFSI, 2026)

Source: Authors' research

Note: The table was developed through a narrative synthesis of the available scientific literature. The identified barriers and enabling factors associated with food safety culture implementation were categorized according to their level of influence (individual, organizational, and external/regulatory factors), based on evidence reported in the studies cited in the Key References column.

4. CONCLUSIONS

The findings of this review indicate that leadership is a critical driver of food safety culture. Management commitment, effective communication, continuous training, and employee empowerment support the development of shared food safety values and behaviours across organizations. Strengthening these elements can enhance food safety performance, support continuous improvement, and contribute to the protection of public health.

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