



# An empirical investigation of food safety culture in onsite foodservice operations



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## ABSTRACT

Limited studies have explored employees' perceptions of food safety culture in onsite foodservices, despite the growing recognition of the impact of improving food safety practices. A cross-sectional paper-based survey was conducted with nonsupervisory employees ( $n = 582$ ) from health care and school foodservice operations ( $n = 51$ ) in three Midwest states to assess food safety culture using an instrument developed and validated in this specific context. This study aimed to investigate the extent to which employees' perceptions of food safety culture differ based on demographic variables and operation characteristics (management system, size, and type of operation). Employees' perceptions of food safety culture were evaluated on factors of management and coworkers support, communication, self-commitment, environment support, work pressure, and risk judgment. Areas of strength and potential improvement were identified; significant differences found in employees' perceptions can guide development of interventions that support safe food handling practices in onsite foodservices.

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## 1. Introduction

Over the last few decades, foodborne diseases have prevailed as a worldwide challenge to ensuring global health. A high percentage of reported outbreaks in the United States (U.S.) have been associated with the foodservice industry (Center for Disease Control and Prevention [CDC], 2007a, 2007b). It was found that 59% of foodborne disease outbreaks in the U.S. reported in 2008 involved retail foodservice establishments (CDC, 2011). The U.S. Food and Drug Administration investigation on the occurrence of foodborne illness risk factors highlighted problems in food handling behaviors within retail foodservice including onsite foodservices (i.e., hospitals, nursing homes and elementary schools) (U.S. Food and Drug Administration [FDA], 2000, 2004, 2009). Onsite foodservice is referred to as “a not-for-profit auxiliary service provided to a ‘captive market’ within larger organizations that have other primary functions” (Khan, 1991, p. 5). This segment of the industry is also known as noncommercial foodservice, which includes educational, governmental or institutional organizations that operates

their own foodservice (National Restaurant Association [NRA], 2012). In the U.S., onsite foodservices were forecasted to account for \$54.2 billion in food sales for 2012 (NRA, 2012) and generate a total of \$95 billion retail sales-equivalent in 2008 (Technomic, 2008 as cited by Bright, Kwon, Bednar, & Newcomer, 2009). Because of the significant industry size, ensuring the safety of food served to onsite foodservice customers is deemed critical. Moreover, onsite foodservices such as health care and school are more likely to serve high-risk populations including young children, elderly, and individuals with compromised immune systems.

Foodservice employees play an essential role in ensuring the safety of food served. Hedberg et al. (2006) found employees' food safety practices (e.g., bare hand contact and handling by infected person) were the main contributing factors to foodborne illness incidents in operations implicated with outbreaks. In the U.S. foodservice industry, the changing demographic profile of employees (e.g., age, ethnicity, language, and literacy) is becoming a major challenge that may impact food safety (Sneed & Strohbehn, 2008). A number of studies have investigated the role of knowledge and attitudes on employees' safe food handling practices in the foodservice industry (Abdul-Mutalib et al., 2012; Bas, Ersun, & Kivanc, 2006; Choi & Rajagopal, 2013; Ko, 2012; Martins, Hogg, & Otero, 2012; Tokuç, Ekuklu, Berberoglu, Bilge, & Dedeler, 2009). Knowledge about and attitudes toward food safety are important, yet factors affecting employees' practices are multidimensional and extend beyond these two constructs (Clayton & Griffith, 2008;

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Mitchell, Fraser, & Bearon, 2007; Neal, Binkley, & Henroid, 2012). Barriers and motivators to perform safe food handling practices in foodservice operations have been studied (Ellis, Arendt, Strohbehn, Meyer, & Paez, 2010; Green & Selman, 2005; Pragle, Harding, & Mack, 2007; Strohbehn et al., 2014). Various factors, in addition to knowledge, affect employees' practices including time constraints, availability of resources, and behavioral issues (e.g., management and coworkers' attitudes) have been reported (Green & Selman, 2005; Howells et al., 2008; Pragle et al., 2007).

Observational research conducted in onsite foodservice facilities has found that even when foodservice employees demonstrate sufficient knowledge of food safety, their practices may not always be consistent with required standards (Giampaoli, Cluskey, & Sneed, 2002; Sneed & Henroid, 2007; Sneed, Strohbehn, & Gilmore, 2004; Strohbehn, Paez, Sneed, & Meyer, 2011; Strohbehn, Sneed, Paez, & Meyer, 2008). Lack of resources (e.g., financial, supplies and time) and issues related to employees' motivation, turnover, and training have been frequently cited as some of the barriers to ensure safe food handling practices (Giampaoli et al., 2002; Sneed & Henroid, 2007; Sneed et al., 2004; Strohbehn et al., 2014). These findings indicate that a variety of environmental, organizational and human factors contribute to the success of food safety practices in onsite foodservice organizations.

Researchers underscore the role of food safety culture in influencing employees' safe food handling practices. Food safety culture has been defined as “the way do we do things [food safety] around here” (Yiannas, 2009, p. 12). Poor food safety culture is increasingly recognized as a risk for foodborne illness outbreaks in the food industry (Griffith, Livesey, & Clayton, 2010a; Powell, Jacob, & Chapman, 2011). Management commitment, organizational priority and support, and communication policy are some of the organizational factors that have been found to influence food safety practices among individual employees and at the organization level (Griffith, Livesey, & Clayton, 2010b; Powell et al., 2011; Yiannas, 2009). Research has investigated the impact of food safety culture on inspection scores (Frash & MacLaurin, 2010); employees' motivation to follow safe food handling practices (Arendt, Ellis, Strohbehn, Meyer, & Paez, 2011); employees' self-reported practices (Sarter & Sarter, 2012; Strohbehn et al., 2014), employees' attitude and behavioral intention (Lee, Almanza, Jang, & Ghiselli, 2013); as well as actual behaviors (Chapman, Eversley, Fillion, & MacLaurin, 2010). Some studies have also analyzed employees' demographic backgrounds to understand the influence of organizational culture on practices (Ellis et al., 2010; Neal et al., 2012; Ungku Fatimah, Arendt, & Strohbehn, 2013).

Food safety culture is a similar concept to organizational culture in the management literature, which describes how employees see their organization as “a system of shared meaning” (Chatman, 1998, p. 333) and the view that members of an organization hold that distinguishes one organization from another. Organizational culture is also viewed as a concept that encompasses a range of individual evaluations of the work environment (James & James, 1989). Based on some of the cultural elements found in the occupational safety and health literature, researchers have proposed that food safety culture can be assessed as employees' perceptions toward the management system, style and process, leadership, communication, sharing of knowledge and information, accountability, risk perception, and work environment (Griffith et al., 2010b; Powell et al., 2011; Yiannas, 2009). To date, none of these elements have been empirically tested for application in the onsite foodservice sector.

The onsite foodservice sector is different than commercial retail foodservices in that this sector typically provides extended service, serves a high volume of meals, is part of a public entity receiving some form of taxpayer support, and has a fairly consistent workforce. There is an increasing interest in the role of food safety

culture on employees' safe food handling practices. However, limited studies have explored food safety culture in onsite foodservice operations using perceptual measures. While some studies have adapted measures from different research fields (Neal et al., 2012), others have evaluated culture as a single construct (Frash & MacLaurin, 2010; Lee et al., 2013; Ungku Fatimah et al., 2013). The current study used a measurement of food safety culture developed and validated specifically in the context of onsite foodservices, and captured multidimensional aspects of culture. The specific objectives of this study were to determine: 1) the extent to which employees' perceptions of food safety culture differed based on demographic variables (age, gender, work status, years of foodservice experience, training, and completion of food safety certification), and 2) whether employees' perceptions of food safety culture differed based on the operation characteristics (management system, size, and type of operation).

## 2. Methodology

### 2.1. Questionnaire design

A paper survey questionnaire containing two sections was developed as the research instrument for this study. The first section consisted of food safety culture measurement, which assessed respondents' agreement on 47 statements (positively and negatively worded) describing food safety practices in their current workplace using a seven-point Likert scale (1 = Strongly Disagree to 7 = Strongly Agree). The development and validation of the food safety culture measurement was based on a focus group study and a review of literature on safety culture surveys and related food safety studies. The focus group study included four focus groups totaling 31 foodservice employees from hospitals or schools (14 from hospitals and 17 from schools). Most (81%) of focus group participants had more than one year foodservice experience. Focus groups were audio recorded and transcribed by an experienced transcriptionist. Two researchers with training and experience in qualitative data analysis, coded and themed the transcripts. Qualitative data analysis processes, similar to those described by Saldana (2009), were used. Identified themes were then utilized as the foundation for question development.

The areas and number of questions on the food safety culture measurement included: 1) Leadership (5 items) – the extent to which leaders visibly demonstrate their commitment to food safety; 2) Communication (7 items) – the quality of the transfer of food safety messages and knowledge among management, supervisory staff and coworkers; 3) Self-commitment (5 items) – employees' values and beliefs about food safety practices; 4) Management system and style (5 items) – coordinated activities or policy and procedure to direct or control food safety; 5) Environment support (5 items) – the availability and quality of infrastructure that support the food safety culture; 6) Teamwork (5 items) – coworkers support with regard to practicing safe food handling in the workplace; 7) Accountability (5 items) – checks and balances in place that make certain desired outcomes are being achieved; 8) Work pressure (5 items) – various aspects of pressure associated with food preparation and service that affects safe food handling practices; 9) Risk perception (5 items) – organizational risk awareness and risk judgment decisions with regard to food safety. The second section of the survey contained questions on participant's demographic and foodservice operation information.

### 2.2. Pilot testing

Prior to pilot testing, the questionnaire was reviewed in terms of content validity and clarity of wording by experts in the area of food

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