Aligning food safety culture assessment tools with the Global Food Safety Initiative's Position: A comparative analysis

Emma J. Samuel*, Ellen W. Evans and Elizabeth C. Redmond

ZERO2FIVE Food Industry Centre Food and Drink Research Unit, Cardiff Metropolitan University, Wales, United Kingdom.

*Corresponding author: emsamuel@cardiffmet.ac.uk

Introduction

An estimated 44 people every minute (equal to 23 million annually) fall sick after consuming contaminated food in Europe[1] while across the United States of America, approximately 47 million people suffer a food-related illness every year[2]. Often an unsolicited burden (disproportionately affecting vulnerable groups), the true extent of food-borne disease is largely unknown due to surveillance system limitations[3]. Thus, with a predicted population increase to 9 billion by 2050[4], assuring food remains safe, wholesome and nutritious in future is a challenging concept.

Alongside steady population growth, dynamic political, environmental and food security climates can also impact global supply chains increasing pressure on businesses to continuously deliver safe food to market[5,6]. For food manufacturing, with high product output, having clear food safety expectations, strong leadership and a proactive approach to managing risks is therefore essential[7,8].

Establishing the maturity of the prevailing food safety culture can indicate improvement opportunities which will ensure that food safety management systems are supported effectively[9,10]. Until recently, comprehensive guidance, holistically demonstrating 'good' food safety culture in practice, was rare. As such, the timely publication of the Global Food Safety Initiative's (GFSI)[10] position paper provides a compelling framework indicative of food safety culture excellence and a food business pathway to positive habitual and systematic behaviours.

Purpose

The aim of this study was to conduct a comparative analysis of the tools available to assess organisational food safety culture in parallel with the attributes included in the GFSI's dimensional framework and suitability of the tool application in food manufacturing.

Methods

- Electronic searches utilising online databases facilitated collection of studies incorporating tools developed to assess and evaluate food safe culture.
- A comparison of the GFSI's key dimensional attributes (i.e. vision and mission, people, consistency, adaptability and hazard and risk awareness) and sub-components was undertaken to identify commonalities and limitations within each mechanism.
- Ethical Approval was obtained from the Health Care and Food, Ethics Panel at Cardiff Metropolitan University (Ref: 9396).

Results

FSC assessment tools

Five tools assessing food safety culture and one tool assessing organisational culture were analysed (*n*=6) in relation to their content, methods and alignment with the GFSI's dimensional framework.

Case studies included food manufacturing facilities in Zimbabwe[11] and Canada[12] and educational food service facilities in Belgium[13]. Commercial tools (*n*=2) represented global food and organisational perspectives[14,15] while one tool was developed to assess food safety culture in small food businesses in the United Kingdom[16].

Tools developed for the commercial market (*n*=2) had less accessible detail, nevertheless, published literature relating to trends, patterns and historical development informed the analysis for this study (as indicated by Table 1).

Table 1: Application of tool by sector (*n*=6).

Industry Sector	Number (%)
Food Manufacturing	*n*=2 (33%)
Food Service	*n*=1 (16%)
Commercial (Industry Wide)	*n*=2 (33%)
Regulatory (Small Food Business)	*n*=1 (16%)

Methods varied dependent on each study (as indicated by Table 2) with three utilising mixed-methods (3 or more) in combination. Triangulation (during data gathering, data analysis or both) ensured findings offered a comprehensive assessment of the phenomena under study.

Table 2: Methods applied in each tool (*n*=6).

Method	Number (%)
Survey (self-assessment)	*n*=5 (83%)
Performance analysis (documentation)	*n*=4 (66%)
Interview	*n*=3 (50%)
Observation of actual behaviour	*n*=3 (50%)

Surveys (used more frequently than any other method) varied in length; the largest consisting of 60 items (12 factors, each with 5 questions) the least including 20 items (relating to 4 categories). Considering the survey practicalities (e.g. length or mechanisms for completion) in a busy production environment terminology used may be useful to ensure valid responses (developed following a pre-review of organisational characteristics).

FSC assessment tool alignment with the GFSI dimensional attributes

Each tool offered methods that were applicable for assessing food safety culture in a food manufacturing environment, however, none addressed every aspect of the GFSI framework; in particular the sub-components contained within each dimension.

Sub-components provide the foundation to support positive 'culture' progression - such as leadership abilities and the quality and content of the organisation's food safety training programme - an evaluation of which would add greater value to any assessment undertaken. Figure 1 highlights the areas less frequently explored in relation to the GFSI's position paper.

Figure 1: GFSI dimensional framework attributes less frequently explored or considered by assessment tools (*n*=6).

Only one tool assessed the documented **Vision and Mission**; a key dimension for establishing food safety expectations that are credible, strategic and comprehensible to every stakeholder. As a pre-requisite to safe food practices, an analysis of this attribute is essential as it will ultimately set the tone and direction for each of the following dimensions.

People dimensions were assessed more often than any other element (by survey or questionnaire). Hypothetical storytelling together with situational card-aided interviews[11] and a social-desirability scale[12] were incorporated in two studies to control for bias. Observations would offer a further reflection in the people dimension, highlighting gaps between reported and actual behaviour as would inclusion of sub-culture influences, language barriers and workforce demographics.

An analysis of organisational **Consistency** featured in most tools to various degrees. However, evaluating consistent leadership qualities, training methods and supporting environmental cues (e.g. signage, facilities and equipment) would be a beneficial (if not necessary) addition to any assessment.

Evidence of **Adaptability** (other than by self-reporting) was limited to an analysis of technical performance documentation in all but one method. A positive food safety culture should reflect the organisation's ability to respond to food safety incidents or change and the requisite skill-set should be evident (spoken, documented and practiced).

Hazards and Risk Awareness was assessed less often than any other attribute; only three studies incorporate observational opportunities in addition to self-reporting. Knowledge of food hazards and application of key controls are fundamental to safe food production, indicative of the organisation's food safety expectations as prescribed by the **Vision and Mission.**

Significance of study

- Each study demonstrated rigorous research standards offering food safety culture assessment methods applicable to a food manufacturing environment. Nonetheless, in following the dimensional framework as indicated by the GFSI's position paper, none of the tools offered an evaluation of every attribute.
- Consideration of the assessment purpose and/or context (i.e. what the business aims to achieve or what the priority should be) would focus the chosen tool or method to ensure that any resulting intervention is bespoke to the business needs and is conducive to positive food safety culture progression. Having purpose will also provide evidence of the extent of food safety culture attribute influence on specific safe food behaviours.
- Ultimately, organisational hazard and risk awareness together with adaptability reflect senior management commitment to, and understanding of, the exemplar food safety behaviour required on the front-line. The method in which food safety expectations are delivered throughout an organisation (e.g. from communication to leading by example) stem from a clear, mandated, Vision and Mission which should form the principle component of any food safety culture assessment to ensure it supports the food safety management system and does not exist in isolation.

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