Diagnosing And Improving Food Safety Culture In Food Businesses

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Abstract

Despite the development of assurance schemes, food safety management systems, HACCP and extensive international and national legislation, deadly outbreaks of food poisoning and contamination still occur. These incidents indicate that many food safety outbreaks are due to food handler error or non-compliance with food hygiene procedures, often despite being trained, audited and risk assessed. Occupational health and safety went through a similar evolution, first focusing on technology and procedures, then focusing on management and more recently safety culture. This reflects a progressive process, with each stage of work building on the previous one. Food safety culture is now coming to the fore. Frank Yiannas (2010) notes that whilst "the importance of organizational culture, human behavior, and systems thinking is well documented in the occupational safety and health fields…significant contributions to the scientific literature on these topics are noticeably absent in the field of food safety". This paper indicates how food safety culture strategies can build upon the foundations of food safety management systems and how organizational food safety culture can be assessed and developed.

Background

The discipline of food safety has advanced greatly over the past decades, with new technology, the application of hazard analysis (HACCP), safety management, auditing and training. However, despite these developments, deadly outbreaks of food poisoning and contamination still occur. In 2005 the largest ever E.coli 0157 outbreak in Wales occurred, affecting more than 150 people, most of whom were children in 44 schools, 31 people were admitted to hospital and a five-year-old boy died. The report (Pennington, 2009) noted that there were serious, and repeated, breaches of Food Safety Regulations. The business failed to ensure that critical procedures, such as cleaning and the separation of raw and cooked meats, were carried out effectively and falsified certain records regarding food safety practice.

In 2008 and 2009 in USA the Peanut Corporation of America (PCA) (now bankrupted) was held responsible for a salmonella outbreak which affected hundreds of companies, hundreds of people suffered food poisoning, 9 people died, the largest food products recall in U.S. history and a fall in peanut butter sales affected the entire industry. They had been audited and given a high rating by a third party assurance firm[1]. The failure was attributed in part to its food safety culture (Mortimore, 2011). The company failed to act on test results indicating salmonella and knowingly shipped out contaminated products, along with many other sanitation violations.

In 2010 pig and poultry feed in Germany was found to contain dioxins above the European legal limits. A batch of fatty acids (industrial fats), which was meant to be used for technical purposes, got mixed with fat for the production of feed so that it contained higher levels of dioxin than allowed by EU law. The batch of fatty acids was from the Harles und Jentzsch plant delivered to a feed fat producing company and then onto compound feed manufacturers. Upon discovery some countries blocked imports from Germany, thousands of farms were closed as a precaution, thousands of animals were slaughtered, egg and pork prices dropped in Germany and a major European investigation was completed, with losses estimated in region of €100m. Despite a private laboratory's sample test reporting more than double the acceptable level of dioxin on 19 March 2010, health officials only learned about the excessive level on 27 December. It was reported that to hide the increased levels of dioxin, up to 77 times above the legal limit, Harles und Jentzsch had, for months, diluted the feed fats or declared these in the control laboratory as technical fats in order to hide the level of dioxins. Harles und Jentzsch, facing claims of around €20 million from about 600 affected farmers and feed suppliers, was

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[1] https://www.aibonline.org/press/AIBStatement04022009/PCASituation.html

bankrupted. Harles und Jentzsch had certification for its major processing unit, but the contaminated fats were processed at a different location which was not audited.

These examples indicate that many food safety outbreaks are due to intentional non-compliance with procedures, despite training and external auditing. Occupational health and safety went through a similar evolution, first focusing on technology, workplace design and procedures, then focusing on management arrangements and more recently safety culture. This reflects a progressive process, with each stage of work building on the previous one, as illustrated in Figure 1.

Figure 1: The progression of safety performance
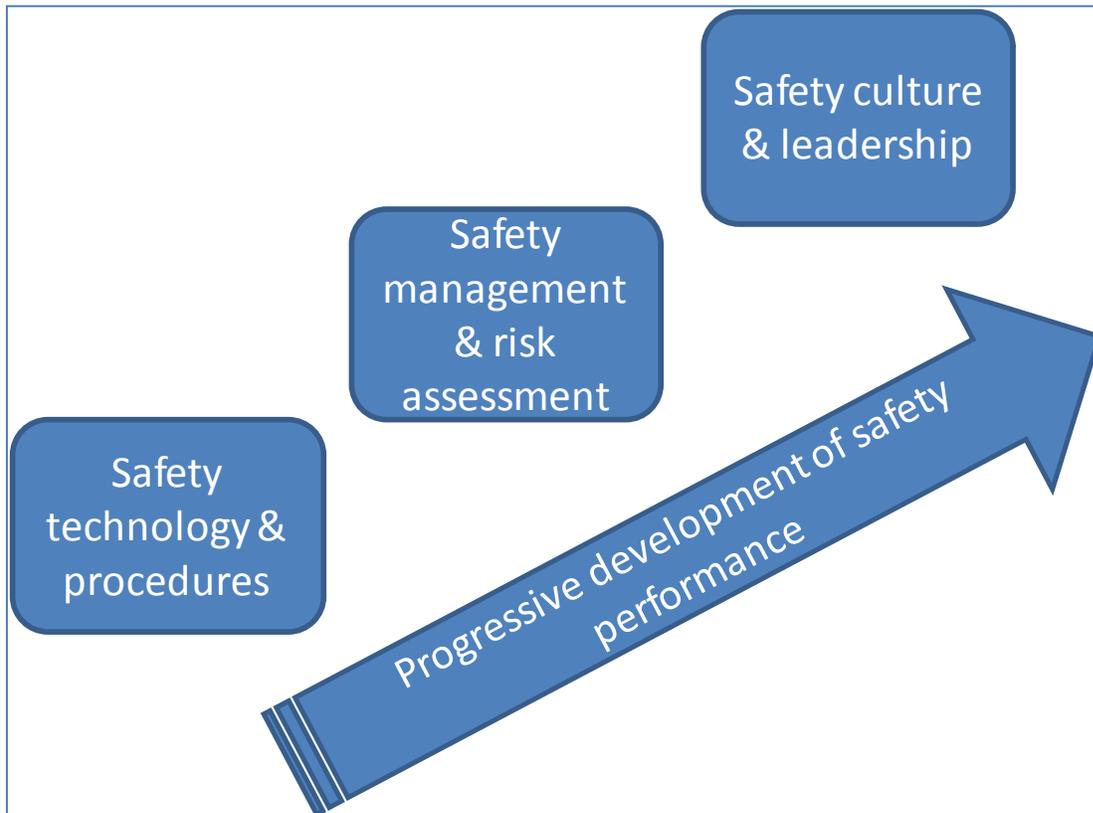
However, Frank Yiannas (2010) notes that whilst *"the importance of organizational culture, human behavior, and systems thinking is well documented in the occupational safety and health fields…significant contributions to the scientific literature on these topics are noticeably absent in the field of food safety"*. Yiannas (2009) argues that:

> *"Achieving food safety success in this changing environment requires going beyond traditional training, testing, and inspectional approaches to managing risks. It requires a better understanding of organizational culture and the human dimensions of food safety. To improve the food safety performance of a retail or foodservice establishment, an organization with thousands of employees, or a local community, you must change the way people do things. You must change their behavior…."*

Against this background, the United Kingdom's Food Standards Agency commissioned Greenstreet Berman Ltd to develop a tool to assess food safety culture and behaviours and link this to advice on safety culture improvement (Wright et al, 2013). This paper draws on the latter work.

Attitudes, perceptions and behaviours

The discipline of psychology has researched peoples' safety attitudes and behaviours for many years in fields as diverse as occupational safety, driver behavior, process safety (such as chemical production), leisure and medicine. This work has sought to answer the following questions:

> *Why do people systematically violate safety rules despite training and being advised of the safety consequences?*

> *Why do organizations or parts of organizations knowingly and continually violate safety rules, ignore evidence of unsafe practices and warnings about potentially catastrophic events?*

Whilst some cases involve conniving criminal intent, in most cases the people involved neither intend nor believe that their actions or inactions will cause harm and they often believe they are behaving how other people would expect them to. Few businesses or workers break safety rules in the belief that they will cause harm to large numbers of people, bankrupt the business and cause consternation amongst customers.

The evidence from numerable cases indicates that behavior is influenced by how people perceive the consequences of their actions, how they perceive other peoples' behavioural expectations and norms as well as their own personal experiences. If an individual or group of people feel that a safety procedure is not justified by the potential risk of harm, they are less likely to accept the justification to comply with that procedure, especially if the procedure is awkward or time consuming. Hazards that cannot be seen, whose effects are remote in time or which are uncertain may be perceived to pose less risk despite scientific evidence or regulations stating otherwise. Rules, procedures and regulations that are judged to have unnecessary safety margins or are "precautionary" may also be judged to not "*really*" be needed. If a person's or an organization's experience is that breaking a safety rule has not had any adverse consequences this can reinforce a perception that the risk is not significant.

If day to day verbal feedback from supervisors and managers suggests that other priorities are more important than complying with a safety rule, this may be taken as an informal message about what the organisation's "*real*" priorities are. If social norms contradict training, it is possible that people will follow the social norm rather than the training. If people get positive feedback when they break a safety rule, such as in order to fulfill production requirements, this may suggest to the individual that the business' "*real*" priority is production rather than safety. If someone feels that their experience and expertise allows them to complete a task in a *better way* this may combine with their self confidence to cause them to short cut procedures because "*they know better".*

Thus, behaviour is influenced by the interaction of individual and group perceptions, social norms and expectations. Violation of safety rules can become the norm and be seen as legitimate where the risk of harm is viewed as low, rules are seen to be unnecessary or a burden and others goals are felt to be more important. This leads to the concept of safety culture.

What is food safety culture?

The question of what is safety culture, and safety climate has been explored at length in the field of occupational health and safety, and is starting to be discussed in the context of food safety. The Health and Safety Commission (1993) stated: "*The safety culture of an organization is the product of the individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety programs. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventative measures.*"

In the case of food safety, Professor Chris Griffith (2011), defines it as "the aggregation of the prevailing relatively constant, learned, shared attitudes, values and beliefs contributing to the hygiene behaviours used in a particular food handling environment" and one must "provide staff with a common sense of food safety purpose". Food safety culture is viewed as:

- How and what the employees in a company or organization think about food safety;
- The food safety behaviours that they routinely practice and demonstrate.

From a cultural perspective, employees will learn these thoughts and behaviours from other people in the organization. These thoughts and behaviours are said to cascade throughout the organization and thereby have a sustained influence on peoples' performance – whether this is for good or bad.

The elements of food safety culture

A number of studies have researched and articulated a view of what leads to an effective food safety culture (for example Yiannas F, 2009. Powell et al 2011, Griffith et al 2010, Yapp and Fairman 2004, Wright et al 2007; Angelillo et al 2000). These studies have reviewed food safety incidents (including the Welsh E.Coli and USA peanut paste incidents), surveyed food businesses and reviewed research in the field of safety culture. The studies have characterized safety culture in two ways, namely:

- By defining *types of organisational cultures*, such as reactive versus proactive, and;

- By defining the *elements* that comprise or influence a culture, such as leadership.

The research suggests that food safety culture has the following elements, also shown in Figure 2:

1. **Business Priorities–** Food business's attitudes towards food safety and the degree to which food safety is prioritised within the organisation.
2. **Risk perceptions–** Food business's (management and staff) perceptions and knowledge of the risk associated with food hygiene (and whether they are significant enough to justify the requirements).
3. **Perception of safety procedures –** The extent to which the business perceives the food hygiene regulations to be valid and effective.
4. **Ownership** of safety **–** The extent to which food businesses accept that the business is responsible for taking a lead in food safety.
5. **Competence –** Knowledge and understanding of risk management systems and procedures.
6. **Leadership** –Clear and visible management commitment and leadership of food safety.
7. **Employee involvement** in food safety **–** The extent to which there is involvement, ownership and accountability for food safety across staff at all levels of the business.
8. **Employee communications –** The extent to which there is open communication and freedom to challenge practices.

**Figure 2: Elements of organisational food safety culture**

Some of these elements seem particularly relevant to the cited incidents, including openness to challenge food safety failings, willingness of people to openly discuss concerns, knowing and understanding the risks associated with the business's practices and the role of top management in creating and maintaining food safety culture. As stated by Griffith et al "*organisational culture must possess an underpinning vision and this articulates the organisation's goals and values and leadership helps to align food handlers with these goals.*" And as Powell et al remark "*Operators should know the risks associated with their products, how to manage them, and most important, how to communicate with and compel their staff to employ good practices—it's a package deal.*"

Care should be taken in viewing these elements as individual elements. In practice there is likely to be an interaction between perceptions, leadership and communications etc. Whilst an organization may vary in how it accords with each element, the research would suggest that an effective safety culture is achieved by making progress across all elements, with each element being mutually supportive. By introducing a positive safety culture incorporating the elements outlined above, this should ensure that businesses have a common view of the importance and validity of food safety requirements as well as the motivation and shared values to effectively manage food safety risks.

The typologies of food safety culture suggested by previous research into food businesses include:

a) **Leaders**: View food hygiene as a critical business issue that they must tightly manage and offers potential business benefits through achievement of a good reputation for food safety and hygiene. Provide visible leadership in continually improving food hygiene.

b) **Proactive compliers:** Understand that risk posed by food hygiene is significant and accept that requirements are effective and necessary. Management provide a lead in encouraging compliance for sake of the business as well as regulatory compliance but may not go beyond "good practice".

c) **Dependent compliers:** Wait upon advice or instruction from regulators and other third parties to make improvements and view food hygiene as something driven by third parties. Tend to view requirements as unfairly complex and unreasonable to expect them to take a lead in understanding and applying. May have low levels of knowledge and training. May not have any clear perception or knowledge of the risk posed by food hygiene.

d) **Doubting compliers:** Doubt the significance of the risk posed by food hygiene and the effectiveness of food hygiene regulations and requirements in managing these risks. May have the capability to understand requirements but doubt the risk. May express cynical view to staff and do not promote compliance other than for legal purposes.

e) **Calculative non compliers**: Intentionally breach regulations for the sake of financial gain, disputing or disregarding risk to people.

By determining which category an organization falls into can help communicate its current performance and encapsulate the type of culture it may aspire to.
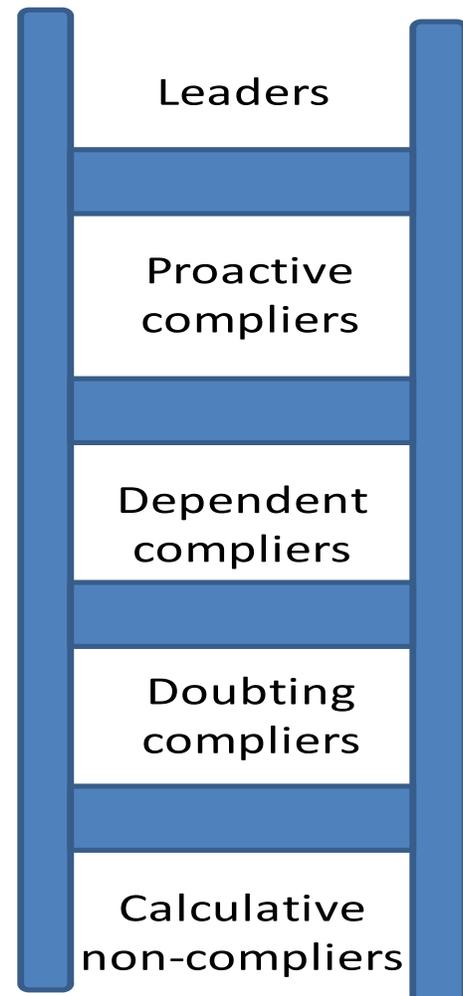
Why assess safety culture?

If you wish to reduce the incidence of non-compliance, you need to understand the causes of non-compliance, in order to be able to identify effective solutions, and to be able to implement them in a cost-effective manner. It is clear from previous research that deliberate non-compliance is based on judgement by the individual within the context of organisational values, norms and expectations.

Type of safety culture tools

In occupational health and safety (OHS) you have a range of safety culture and safety climate assessment tools, including:

1. Safety climate questionnaires.

These tend to be long questionnaires that are typically completed as a survey by employees. Results can be compared against other firms that have completed the questionnaire. Also, results can be assessed for each part of the questionnaire to identify areas for improvement. As a 'climate' questionnaire it assesses how

employees feel and their beliefs rather than pinpointing causes of behavioural issues or linking results to potential interventions.

2. Behavioural safety observation.

These tend to be applied by trained observers within an organization with employees being scored against lists of safe and unsafe behaviours. Targets are set for improving the ratio of safe versus unsafe behaviours, with support offered on reducing unsafe behaviours.

3. Safety culture diagnostic toolkits and indicators

These tend to be good practice benchmarks and indicators with associated guidance used to both assess the level of safety culture in an organization, diagnose issues and identify potential organizational changes. They indicate the levels of safety culture, such as "emerging" versus "continually improving" and are designed to support the development of action plans. The benchmarks may be applied through self assessment, such as during workshops, surveys and observation by assessors.

The latter methods go beyond measuring "climate" to assessing the causes of the climate in an organization so that solutions can be developed, as per Figure 3

## Figure 3: Safety Culture Assessment and improvement
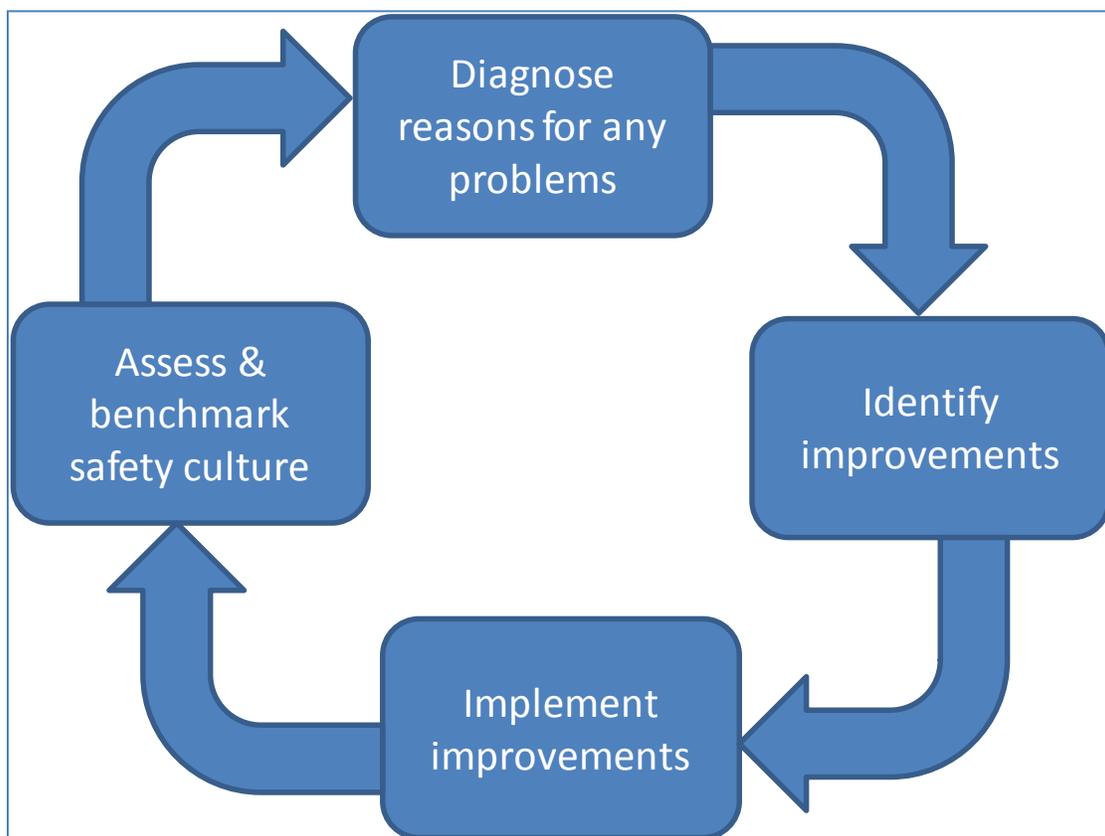
Whilst many of the existing safety culture tools have some form of validation, most notably construct validity, none of the tools were developed specifically to assess food safety culture.

A key lesson learnt from occupational health and safety concerns the validity of the behaviours being measured. Many high hazard firms focused on "easy to observe" occupational safety behaviours, such as the use of personal protective equipment. Whilst this helped to reduce "everyday" occupational accidents, some firms subsequently experienced major accidents. Their low occupational accident rates were found to have led to a false confidence in their safety performance. The lesson learnt is to be careful that the tool does not focus on a sub-set of risk attitudes and behaviours, namely everyday observable behaviours, whilst omitting less frequent hazards that have major impact. Any diagnostic tool needs to reflect the full spectrum of risks and their related attitudes and behaviours.

A diagnostic tool for food safety culture

The typologies and elements identified from previous research can be used to guide an assessment of an organisation's food safety culture. As shown in Figure 4 a business can be "scored" on each safety culture element, with Leaders being the most effective safety culture.

Figure 4: Assessing elements of organisational food safety culture
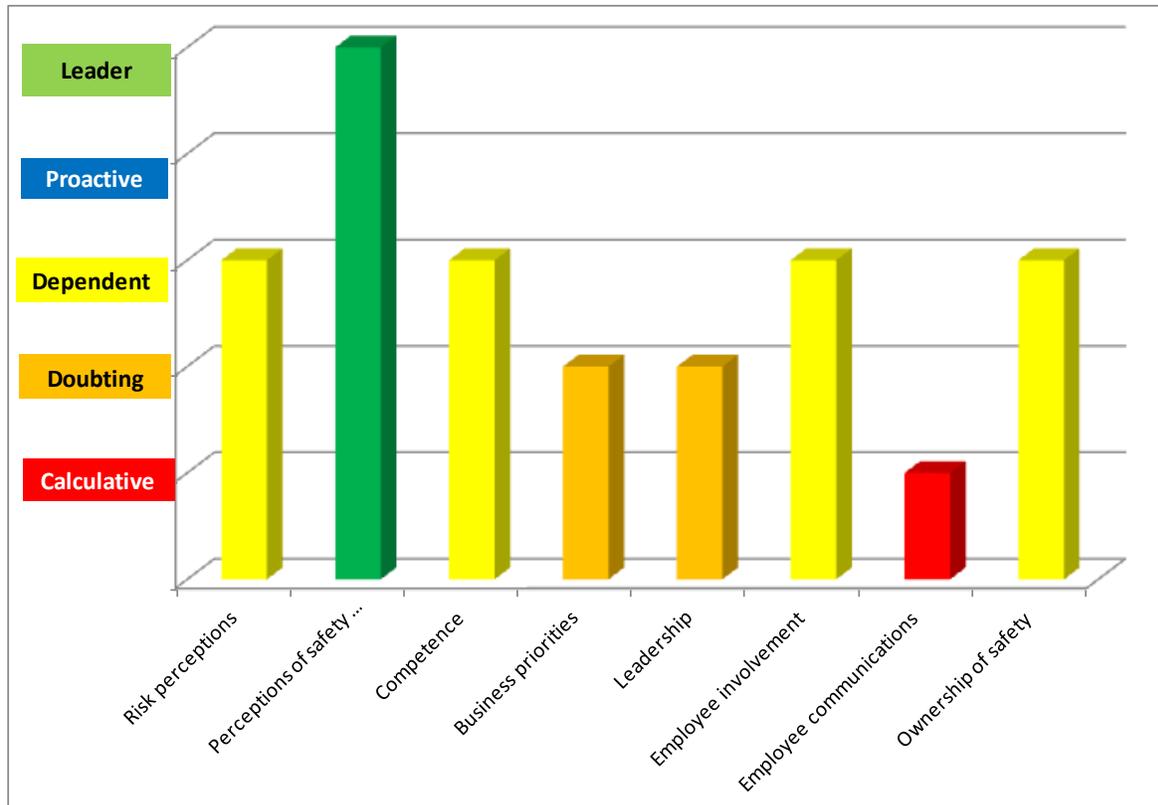
Examples of assessment questions

The culture in an organization can be assessed against these benchmarks by applying questions such as:

1. What are your key business priorities?

2. If businesses like yours did not comply with food hygiene and food safety requirements, do you think that this would create a significant possibility of customers getting food poisoning?

3. 'How necessary do you think (practice x) is for preventing food poisoning or other food safety problems?

4. How valid and appropriate do you think food hygiene and safety requirements are, with respect to the food risks in your business?

5. How reasonable is it for people to expect a business like yours to take responsibility for understanding and complying with food safety and hygiene regulations?

6. How important is it that your staff understand how failing to follow specific food hygiene practices might harm customers? Or is it okay that they just do what they are told to do?

7. How do you encourage staff to behave correctly/follow the rules for food safety when they are handling food?

8. What do you do to ensure you set a good example in following food hygiene and safety rules?

9. Who is involved in reviewing food safety and hygiene practices and identifying how to improve these practices? For example, if a fridge is not working, who decides what to do about it?

10. What do you say to staff when they report a food hygiene problem?

Linking improvements to cultural diagnosis

Having assessed an organization, behavior interventions can be aligned to its cultural profile as per Table 1.

Table 1: Typical type of guidance on cultural improvement linked to current type of culture (exerts)

Category	Advice for enabling improvement
a) **Leaders:**	**Applaud and reinforce commitment to best practice.** **Applaud the organisation, encourage them to display Food Hygiene Rating Scheme certificate (if applicable), . If not already considered by the business, encourage them to become member of associations ..Ask about future plans and applaud examples of planned actions by the business.**
b) **Proactive compliers:**	**Applaud and encourage next steps.** **Applaud their achievements and encourage them to build on this by keeping up with latest developments and thinking of their own novel ways of further improving performance. Engage the business in positive (non critical or adversarial) discussions about the risk posed by each of their food safety hazards and how best to manage them, entertain debate and thank them for their enthusiasm and interest in considering how best to manage food safety.........**
c) **Dependent compliers:**	**Encourage and enable self reliance.** **Provide advice on how they can develop their own ability to comply, such as low cost training, and emphasize that it is their responsibility to understand significant food hazards and identify suitable controls (whilst saying you are willing to help them to a reasonable level). Use examples to illustrate that the requirements are not complex and can be achieved...**
d) **Doubting compliers:**	**Convince and dispel doubts.** **Explain and provide evidence and examples of the hazards (specific to the food business) and where people have been harmed by these. Suggest that they go on relevant training to learn about the hazards or read relevant leaflets etc...Highlight how the behaviour of the business manager(s) sets an example for the rest of the staff....** **Sympathise with their concerns and then explain what 'good looks like'.**
e) **Calculative non-compliers:**	**Challenge and convert** **Highlight cases where harm has occurred and cases where people have been prosecuted and jailed for intentional non compliance, and examples of business failures due to incidents. Challenge their attitudes and indicate the minimum steps to comply.......**

Conclusion

An appropriate set of attitudes, norms and behaviours are viewed as underpinning and supporting good management, training, technology and procedures. It is the culture of the organization and people within it that influences whether people will apply their training and follow procedures. Indeed, an effective safety culture is thought to be one in which people will, without prompting, offer innovative ways of improving safety performance, report problems and help solve issues. Previous work in the fields of occupational health and safety culture and patient safety culture along with the more limited research into food safety culture provide a basis on which to assess food safety culture and advise on improvements. Future work could usefully include assessing food safety culture in a range of organisations to produce a benchmarking dataset and to validate the benchmarks.

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