A Tool to Diagnose Culture in Food Business Operators

Report from Greenstreet Berman Ltd for the Food Standards Agency

R1 V6

GSB Ref: CL2567

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Title	A Tool to Diagnose Culture in Food Business Operators Report from Greenstreet Berman Ltd for the FSA	
Reference	GSB CL2567 R1 V6 FCA	
Status	Final client approved	
Previous version	V6	
Revisions made	Minor edits following peer review	
Author (s)	Michael Wright, Paul Leach and Gill Palmer	
Reviewer	Trevor Stockwell	
Distribution	FSA	

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Key findings

Food safety culture has been given greater attention recently due to increased interest in the role of business attitudes in achieving compliance and avoiding food poisoning. This mirrors the sequential progression from engineering and procedural solutions to safety, towards managerial and more recently cultural solutions to safety performance seen in the areas of occupational health and safety culture and patient safety.

This work developed a tool for use in identifying aspects of good/poorer safety cultures in food businesses, particularly aimed towards micro and small and medium sized (SMEs) businesses.

The first stage of work identified and reviewed existing safety culture assessment tools. A total of 169 questionnaires and tools were identified. A large number of these were variations of safety climate questionnaires and had been used in safety culture research. 15 toolkits/questionnaires were shortlisted for potential inclusion in the detailed review. The review of the current tools noted that:

- Many of the existing safety culture tools have some form of validation, most notably construct validity;
- None of the tools had been developed specifically to assess food safety culture or specifically for application to micro or small firms;
- A large majority of the tools are diagnostic in nature. These tools also exemplify a way of categorizing businesses' safety culture in a way that can be mapped on advice.

The combination of food safety culture research and review of existing safety culture assessment techniques was sufficient to develop an initial version of a food safety culture toolkit. The initial concept was to:

- Have 5 to 6 main headings to categorise businesses in relation to their attitude and approach to food safety management (`category`);
- Have up to 10 elements / indicators per category that can, optionally, be used to produce a more detailed assessment of a business culture;
- Provide advice on improvements mapped to these categories.

The initial draft of the toolkit was reviewed in two workshops by environmental health officers and food business operators. The workshops provided a basis for the further development of the toolkit. Key changes included:

- Providing an outline of how the tool may, at the inspector's discretion, be used to inform confidence in management ratings and enforcement decisions;
- Amending the categories and elements; and
- Providing guidance on how to improve safety culture for each combination of category and element.

The final version of the toolkit included 5 categories of safety culture and 8 elements, in a matrix, along with a body of guidance for inspectors on how to improve food safety culture in businesses.

Future work could usefully include a quantitative scale of piloting to further test its usability and to assess its reliability and validity. A larger scale pilot could involve, for example, researchers or inspectors applying the tool to a sample of businesses. Ideally the sample would be designed to include a wide spectrum of businesses, from micro to large, across sectors and representing all standards of performance.

Executive summary

Background

Food safety management is commonly conceived to include matter such as time/temperature processes, sampling, post-process contamination, hygiene training and HACCP. An outbreak of *E. coli* O157 in South Wales in 2005 and the publication of the Public Inquiry Report in March 2009 highlighted the issue of cultures and behaviours in businesses and enforcement bodies and its role in influencing compliance with food hygiene legislation. Occupational health and safety went through a similar evolution, first focusing on equipment, workplace 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.

What is food safety culture?

Professor Chris Griffith[1], defines food safety culture as "the collective food safety practices used within an organization … taking into account both food safety culture and food safety management….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."

Aims of this work

This work was commissioned by the Food Standards Agency (the Agency) to:

1. Review what safety culture diagnostic tools are available and used, particularly with regard to micro and SME businesses.
2. Provide a review of the effectiveness of such tools where possible.
3. Develop a tool for use in identifying aspects of good/poorer safety cultures in food businesses, particularly aimed towards micro and SME businesses.

Approach to the work

Having reviewed existing tools and food safety culture research, a tool was drafted. This included a desktop phase of work supported by a food safety expert to ensure the terms and questions were specific to food safety. The tool was tested qualitatively by food businesses and food hygiene inspectors in two workshops. The workshop results were used to produce a draft final tool for review with the Agency.

Review of previous tools

The review of the current tools noted that:

- None of the tools had been developed specifically to assess food safety culture;
- The typologies used for some tools and elements of safety culture covered overlap with those noted in food safety culture research;
- Most tools have not been developed specifically for micro or small firms;
- Many of the existing safety culture tools have some form of validation;
- A large majority of the tools are diagnostic. These tools also exemplify a way of categorizing businesses' safety culture in a way that can be mapped on advice;
- A majority of the tools use a triangulation of methods to explore culture and

[1] http://www.foodsafetymagazine.com/article.asp?id=4099&sub=sub2

utilise workshops or a toolkit based approach and are examples of how tools can be designed for use in a face to face session;

- Two tools have been developed for use by inspectors within site inspections;
- The majority of the tools do not use typologies. Rather they are structured around a number of elements. In almost all cases the maximum number of elements measured is 10, with minimum of 5;
- A number of tools are intended for completion as a survey of staff and measure safety climate rather than specifically diagnose culture and mapped advice. This is not considered applicable by inspectors during “routine” inspections of micro or small food businesses;
- Some models presume that safety is driven by a wish to prevent accidents rather than avoid compliance with regulations. This presumption is not appropriate for a tool aimed at portraying business cultures which might be amoral.

Initial concept for a food safety culture assessment tool

The key principles guiding the development of the food safety culture diagnostic tool included that it should:

- Be applied by food hygiene inspectors during inspections;
- Not require extensive employee questionnaire surveys;
- Be applicable to micro and small businesses in addition to larger businesses;
- Avoid any cultural bias in its questions;
- Be specific to food safety and the application of key techniques, such as HACCP;
- Provide a means of mapping from assessment results to advice on how to improve safety culture.

The initial concept was to:

- Have 5 to 6 main headings to categorise businesses in relation to their attitude and approach to food safety management (`category`), drawn from food safety culture research, and to provide definitions of these;
- Have up to 10 elements / indicators per category that can, optionally, be used to produce a more detailed assessment of a business culture;
- Provide advice on improvements mapped to these categories.

Food business operator and environmental health officer workshop feedback

The initial draft toolkit was reviewed at two workshops. The key findings included:

- The titles of the elements and categories needed to be amended to be clearer and to match delegates’ views of business attitudes;
- The applicability of the tool to micro businesses was, in some respects, challenged;
- The use of the tool by inspectors needs to be clarified, especially with reference to enforcement decisions and inspection ratings;
- Whilst inspectors felt they already assessed safety culture, if informally, (Food Business Operators (FBOs) doubted the ability of inspectors to assess safety culture without additional training;

- Additional guidance on how to improve safety culture would be welcomed.

There were also comments on detailed aspects of wording and presentation of the categories and elements.

Amended toolkit

The feedback from delegates was reviewed and discussed with the Food Standards Agency. The final version of the categories and elements are shown in Table 1. Elements refer to the "building blocks" of safety culture. The categories are qualitative descriptions that align to how a business "scores" on each safety culture element, with Leaders being the most effective safety culture.

Table 1: Suggested food safety culture elements and categories

ELEMENT	Category				
	a) Calculative non-compliers:	b) Doubting compliers:	c) Dependent compliers:	d) Proactive compliers:	e) Leaders:
Business priorities and attitudes towards food hygiene					
Business's perception and knowledge of food safety hazards					
Business's confidence in food hygiene requirements					
Business ownership of food safety and hygiene					
Competence, learning and training in food safety and hygiene systems					
Leadership provided on food safety and hygiene					
Employee engagement in review & development of food hygiene practices					
Communications & trust to engage in food safety and hygiene & report issues					

1 INTRODUCTION

1.1 Aims of this work

This work was commissioned by the Food Standards Agency (FSA) to:

1. Review what safety culture diagnostic tools are available and used, particularly with regard to micro and SME businesses.
2. Provide a review of the effectiveness of such tools where possible.
3. Develop a tool for use in identifying aspects of good/poorer safety cultures in food businesses, particularly aimed towards micro and SME businesses where possible.

The outcomes included:

1. A report including a review of safety culture 'diagnosis' tools and their effectiveness or impact where possible.
2. A presentation to FSA staff.
3. A draft tool for diagnosis of culture for trialing in the field by regulator staff with food businesses.

1.2 State of the art and scientific basis for the work

Food safety management is commonly conceived to include matter such as time/temperature processes, sampling, post-process contamination, hygiene training and HACCP. An outbreak of *E. coli* O157 in South Wales in 2005 and the publication of the Public Inquiry Report in March 2009[2] highlighted the issue of cultures and behaviours in businesses and enforcement bodies and its role in influencing compliance with food hygiene legislation. The outbreak – the largest ever incidence of E. coli O157 in Wales and the second largest in the UK – affected 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 notes that there were serious, and repeated, breaches of Food Safety Regulations. The Food Business Operator (FBO):

- Failed to ensure that critical procedures, such as cleaning and the separation of raw and cooked meats, were carried out effectively;
- Falsified certain records regarding food safety practice;
- Lied to Environmental Health Officers;
- Had a significant disregard for food safety and thus, for the health of people who consumed meats produced and distributed by his business.

Similar lessons have been learnt from incidents overseas. For example, in the USA the Peanut Corporation was responsible for a salmonella outbreak which affected 3000 companies and resulted in 9 deaths and 4000 recalls. They had been audited and given a high rating. The failure was attributed in part to its food safety culture. [3]

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. Recognising that many food businesses are small, compliance is thought to be highly influenced by the person in charge, just as senior management influence norms in larger businesses. As

[2] http://wales.gov.uk/ecolidocs/3008707/summaryen.pdf?skip=1&lang=en

[3] Sara Mortimore, Vice President, Quality Assurance and Regulatory Affairs, Land o'Lakes, USA Global Food Safety Conference 2011

expressed by Chris Griffith[4] with reference to food safety:

"Thousands of businesses are over-managed but underled with a negative culture where safety is a low priority. Many more have a neutral culture of complacency. Big companies are especially prone to this. How many of you have a positive culture of passion and commitment?"

Occupational health and safety went through a similar evolution, first focusing on equipment, workplace 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, with, for example international conferences such as the 2011 Global Food Safety Conference. Indeed, the Underwriters Laboratories (UL) in the USA have launched[5] an initial training platform on "Food Safety Culture," which is designed to "guide food industry executives through the process of creating an organizational culture to ensure that food products are safe and meet consumer and regulatory requirements". It covers corporate management responsibility, communication of food safety objectives to all company employees, and continuous improvement in Hazard Analysis & Critical Control Points (HACCP) and overall food safety systems. Also, Fatimah et al[6] report that they are developing organizational climate measures based "upon an analysis of existing safety climate surveys, expert reviews, and pilot testing". They report that the "measures developed from this study may be used in future research to better understand the impact of climate for safe food handling on organization food safety outcomes". We have been unable to identify any published results at the time of preparing this report.

However, Frank Yiannas[7] 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". Frank Yiannas is the author of 'Food Safety Culture. Creating a Behavior-Based Food Safety Management System', the only book identified by Greenstreet Berman Ltd specifically on food safety culture. He 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…."

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[4] Chris Griffith, Editor British Food Journal and Head of Food Research and Consultancy Unit, University of Wales, UK and Technical Director of Von Holy Consulting, South Africa Global Food Safety Conference 2011

[5] http://www.prnewswire.com/news-releases/ul-launches-new-food-safety-initiative-128001093.html

[6] Ungku Fatimah Ungku Zainal Abidin, Susan W. Arendt, & Catherine H. Strohbehn. Department of Apparel, Educational Studies, and Hospitality Management Iowa State University. *Organizational climate for promotion of safe food handling practices: Development and validation of measures in foodservice organizations.* http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1105&context=gradconf_hospitality

[7] Yiannas, Frank. *Food Safety Culture. Creating a Behavior-Based Food Safety Management System.* Series: Food Microbiology and Food Safety. 2010 Springer Science+Business Media. ISBN 978-1-4419-2500-8

1.3 Matching interventions to business attitudes

Previous work in 2004[8] cited in the Invitation to Tender assessed what is known about culture and behaviours in businesses, a theoretical model describing the process of how SMEs decide to comply with food safety law. A series of studies have built on these points since 2004, including for example the report "Analysis of the decision process within business to improve food safety and standards, both voluntarily and in response to regulation, and associated stakeholder consultation processes" by GSB published in 2006[9]

Similar work has been completed in other regulatory areas and have related business attitudes to regulatory and non-regulatory interventions, such as "Business perspectives on securing compliance" (Greenstreet Berman Ltd for DEFRA, 2011)[10] in the context of environmental law. The research aimed to improve the understanding of business compliance behaviour and business perception of the relative effectiveness of approaches to securing environmental compliance. The primary research was qualitative and acquired in-depth feedback from businesses about their perceptions, attitudes and behaviours. These studies found that 1) businesses' compliance behaviours are influenced by business drivers and regulations as well as their capacity to comply, and perceptions of risks, and 2) a range of approaches to securing compliance need to be matched to the attitudes and capacity of businesses. The findings provided support for a broad range of enforcement powers that enable environmental regulators to advise, guide, deter and punish businesses in a way that matches businesses' attitudes. This study suggested a model of responsive regulation whereby the prior attitudes of businesses are taken into account in enforcement decisions.

A number of behavioural models have been developed of business compliance to support targeted enforcement as part of a strategy of responsive regulation. For example, Jensen and Jensen (2003)[11] developed a simple guide to matching enforcement tactics to the exhibited attitude of the organisation, as per Figure 1. They classify businesses according to whether they are willing and able to comply, with three categories, I = willing and able, II = able but not willing, III = Neither willing nor able. The proposal was to focus resources on type III organisations. This was termed 'Adapted inspection'.

Figure 1: Danish model of business compliance behaviour

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">Willing to comply</td></tr>
<tr><td>Yes</td><td>No</td></tr>
<tr><td rowspan="2">Able to comply</td><td>Yes</td><td>I</td><td>II</td></tr>
<tr><td>No</td><td colspan="2">III</td></tr>
</table>

[8] *The Evaluation of effective enforcement approaches for food safety in SMEs* , Charlotte Yapp and Robyn Fairman 2004. http://www.food.gov.uk/multimedia/pdfs/e03003finalreport.pdf

[9] http://www.foodbase.org.uk/results.php?f_report_id=50

[10] *Business perspectives on approaches to securing compliance* - BR0103, Greenstreet Berman Ltd 2011. http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17702

[11] Jensen P and Jensen J. *Carrots and sticks – inspection strategies in Denmark*, July 2003. National research centre for OHS regulation. Online publication http://ohs.anu.edu.au/publications/pdf/wp%2012%20-%20Jensen%20and%20Jensen.pdf

Similarly, Defra[12] developed a segmentation of UK farmers with respect to their attitudes towards animal welfare. Farmers were split into 'custodians', 'lifestyle choice', 'pragmatists', 'modern family businesses' and 'challenged businesses'. They go on to argue that it is necessary to "Recognise and respond to individual characteristics…" **(**p21) when deciding on interventions. They also cite the concept of the 'S' curve. The 'S' curve envisages that "as time progresses, the change from the few early adopters or innovators through increasing pace of take-up as mainstreaming occurs and then the pace slows with the later adopters who may be more cautious or who have other external or internal barriers.[sic]" (p9). Businesses and individuals may be moved up the 'S' curve by a mixture of advice, incentives and support. In the context of this study, advice may act as an enabler, overcoming barriers such as lack of understanding, whilst disseminating news of enforcement may demonstrate new social norms.

These latter studies provide examples of how assessment of business attitudes and behaviours may be used by regulators and inspectors to decide on how to influence that organization.

Finally, a 2006 FSA study[13] completed by Greenstreet Berman highlighted the impact that the FBO's perceptions of regulations, and regulator and inspectors' actions can have on FBO safety culture. For example:

"The research also indicates that the motivation of businesses to manage specific aspects of food safety and hygiene is influenced by their perception of the substantiveness and significance of the risk, as well as their judgement of what is a proportionate standard of management. Businesses are less likely to be motivated to improve standards for specific risks that are considered to be trivial, in the absence of consumer demands. Businesses are motivated to achieve societal expectations regarding safety, as part of their achievement of reputation and image." (p46)

The latter considerations highlight the role of 'relationships, trust and confidence' in FBO attitudes. Trust is important in influencing the extent to which businesses can have confidence in the validity and proportionality of standards, and hence their perception of the substantiveness and fairness of those standards. In addition, the extent to which businesses understand the nature and degree of risk influences their acceptance of the substance of the requirements. Their perception of the balance between the requirements and their resources influences their perception of the proportionality of the requirements.

This finding highlights the potential importance of including an assessment of FBO's perceptions of food safety regulations and risks within an assessment of safety culture, perhaps along with an assessment of their perceptions of the fairness of inspection and enforcement. These perceptions may influence their attitudes to food safety compliance and associated behaviours. These findings also highlight the issue of how inspectors' behavior may influence FBO food safety culture. FBOs need to see inspections as fair, consistent and proportionate, with advice provided where needed but not to the extent that FBOs become dependent on the inspector. The type of intervention by the regulator needs to match the expressed attitudes of the FBO, such as highlighting food safety risks if these are not recognized by the FBO, citing "simple" risk controls if the FBO feels

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[12]DEFRA (Pike, T) November 2008**.** *Understanding behaviours in a farming context: Bringing theoretical and applied evidence together from across Defra and highlighting policy relevance and implications for future research*. Published online: http://archive.defra.gov.uk/evidence/statistics/foodfarm/enviro/observatory/research/documents/ACEO%20Behaviours%20Discussion%20Paper%20%28new%20links%29.pdf

[13] *Analysis of the decision process within business to improve food safety and standards, both voluntarily and in response to regulation, and associated stakeholder consultation processes*. McMahon, A ; Wright, M; Norton Doyle, J; Smith, R; Ali, F; Walker, O. 2004 to 2006, Food Standards Agency

compliance is impractical and so on, i.e. conveying key messages and information to redress any problematic aspects of the FBO's food safety culture.

1.4 Issues that are of particular importance to food hygiene

Whilst there are lessons to be learnt from occupational health and safety and environmental for food safety culture, there are some particular issues to consider in the context of food safety. These include:

- Most businesses are small or micro[14] – for which a corporate framework is not appropriate;
- Many food businesses are managed by or employ black or other minority ethnic people - with cultural and language considerations;
- The management of suppliers is also a key aspect of food safety;
- HACCP.

The inquiry into the Welsh E.coli outbreak stated that "culture was dependent upon the knowledge standards, motivation and leadership of the (sole) person in charge and effectiveness of communication and trust by staff." It also recommended "that the HACCP approach and food safety management system should be embedded in the business' working culture."

Also, as noted by the Welsh E.coli inquiry "If anything was likely to have encouraged William Tudor to get his act together on food hygiene, it would have been the direct threat of failing to secure, or losing, what was a very significant contract". (P4)

Work by the Maricopa County Environmental Health Services[15] highlights the importance of ethnicity. They developed the "cultural competence" of their staff to establish a trust relationship with the industry. Their training materials, for inspectors, provided an understanding of "what procedures must be followed to ensure food safety controls while at the same time providing regulatory staff with a better understanding of ethnic food preparation processes." This highlights the need to ensure that questions about food safety culture are valid measures across all cultures.

It is also important to make the diagnostic questions specific to food safety. Questions need to be linked to key food safety processes such as:

- Temperature control & monitoring equipment, protective clothing, chemical supplies etc;
- HACCP;
- Food separation, storage and handling;
- Sanitation, pest control etc.

1.5 Type of safety culture tools

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

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[14] For example, 87% of hotel and restaurants have less than 10 employees according to data from the Business Population Estimates for the UK and Regions issued by Business Innovation and Science department http://www.bis.gov.uk/analysis/statistics/business-population-estimates

[15] Beegle, D. Reducing Risk Factors at Retail and Food Service, Maricopa County Environmental Health Services, 2009. http://www.fda.gov/Food/FoodSafety/RetailFoodProtection/IndustryandRegulatoryAssistanceandTrainingResources/ucm088889.htm

1. Safety climate questionnaires.
2. Workshop based assessment of organisational behaviours, such as the Safety Culture Maturity® Model.
3. Behavioural safety observation.
4. Systems review and performance indicators, such as the Health and Safety Executive's Human Factors Toolkit.
5. Business excellence model- ladder model.

These tools vary in length, purpose and design.

One of the most well known is the Health and Safety Executive's Safety Climate Questionnaire (sold and supported by the HSE's Health and Safety Laboratory). This is a long questionnaire that is typically applied by businesses to themselves and is 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 by design assesses how employees feel and their beliefs rather than pinpointing causes of behavioural issues or linking results to potential interventions.

By contrast, the Health and Safety Executive developed a Human Factors toolkit[16] for application by their inspectors. This toolkit covers safety culture and is phrased for application by their inspectors during visits to firms. The toolkit includes lists of key questions that can be answered during site visits.

The Health and Safety Executive are also in the process of developing a leadership assessment tool. The tool is to be used for inspectors and aims to assess all essential elements of leadership for safety. The development of the tool emphasizes the recognition that leaders create the culture of the organisation and hence to improve safety and culture, leadership needs to be systemically assessed. The tool is in development but the HSE have recently published guidance and checklists for leadership assessment and development.[17]

A "Safety Culture Questionnaire" which comprises just 5 questions was developed by John Ormond Management Consultants Ltd to provide "snapshot" views, from management, supervisors, and workforce, of their organisation's safety culture.[18]

The Safety Culture Maturity® Model (SCMM) was developed by the Keil Centre for the Health and Safety Executive and has been used across oil, gas, petrochemical, rail, healthcare, chemical and steel industries in the UK and other countries. It is applied as a self assessment exercise within a workshop format. It indicates five levels of safety "maturity" from "emerging" to "continually improving" each with ten elements. The tool aims to directly support the development of action plans as well as benchmarking between organizations.

The latter examples suggest that a diagnostic tool needs to go beyond measuring "climate" to assessing the causes of the climate in an organization so that solutions can be developed.

A final 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

[16] http://www.hse.gov.uk/humanfactors/topics/toolkit.pdf

[17] http://www.hse.gov.uk/pubns/indg417.pdf

[18] *Improving Safety Performance – A Question of Culture*, John Ormond and Tony Fishwick, Industrial Safety Management, Vol 4, Edition 4, December 2001.

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. Indeed Greenstreet Berman recently adapted the HSE climate tool to measure occupational health and safety and process safety at Centrica Gas Storage. The process involved adding questions focused around behaviours and attitudes associated with the management of the engineering process. This covered topics such as maintenance, degraded working, competence and compliance with engineering standards. The adaptation of the questionnaire meant that the full spectrum of risks and their related attitudes and behaviours were assessed.

1.6 Scientific approach and study design

The work needed to identify existing safety culture tools, review these, draft a tool suitable for food safety and outline subsequent validation work. Therefore, a multi stage study design was required that first systematically identifies and reviews existing techniques. Our first objective included:

- Systematically searching (using key words and recognised databases) for existing safety culture tools and short listing them for detailed review;
- Agreeing criteria for the review of these tools – ensuring the criteria match the specific aims of this project (assessment of food safety culture by hygiene inspectors in micro, small and larger food business, and linking results to interventions);
- Completing a review and comparing tools to food safety culture research.

The second objective included a desktop phase of work supported by a food safety expert to ensure the terms and questions are specific to food safety. To ensure the tool was appropriate for food safety two workshops assessed comprehension, face validity and rated importance of the questions and related guidance (content validity). The workshop results were used to produce a draft final tool for review with the FSA, as part of our third project objective. As any assessment method should be tested and validated, we outlined a potential field trial and validation of the tool.

2 FOOD SAFETY CULTURE

2.1 What is 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.’’

Coreil, Bryant, and Henderson, (2001[19]) state ‘‘Culture is patterned ways of thought and behaviour that characterize a social group, which can be learned through socialization processes and persist through time.’’ (p11)

Professor Chris Griffith[20], defines it as “the collective food safety practices used within an organization … taking into account both food safety culture and food safety management….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.

2.2 Elements of effective food safety cultures

2.2.1 Previous research

Some recent studies and articles have articulated a view of what leads to an effect on food safety culture.

Frank Yiannas

Frank Yiannas’s book[21], Food Safety Culture: Creating a Behaviour-based Food Safety Management System (2009) provides an overview of food safety culture from a behavioural safety perspective. The text assumes a level of organisational awareness and positive attitude is already in place, and therefore focuses on changing behaviour as a means of leading organisational food safety culture. The views expressed within this book in the context of food safety culture are very similar to those expressed for occupational health and safety elsewhere[22], the main elements of which include:

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[19] Cited within F. Yiannas, (2009). *Food Safety Culture: Creating a Behavior-Based Food Safety Management System (Food Microbiology and Food Safety).* Springer science.

[20] http://www.foodsafetymagazine.com/article.asp?id=4099&sub=sub2

[21] Yiannas, F. (2009). *Food Safety Culture: Creating a Behaviour-based Food Safety Management System*. Springer. New York:USA.

[22] Whiting, M & Bennett, C. (2003). *Driving toward “0”: Best practices in corporate safety and health*. The

- **Clear Management Visibility and Leadership** – Yiannas states that "Safety is a firm value of the organisation" with the development of food safety culture formed through a top down approach. Culture is therefore created through organisation leaders who choose to have a food safety culture within their business and maintain this over time. He goes on to say that "Managers at all levels of the organization need to visibly demonstrate their commitment to food safety by the little things they say and do" and cites examples such as FBO washing their hands and their expressed attitudes towards sanitation. Therefore the example set and values voiced by organisational leaders should be consistent and clearly visible to give employees confidence in the organisation's commitment to food safety;

- **Accountability at all levels** – It is proposed that organisations should clearly assert performance expectations for all employees and ensure accountability is clear for individual roles. Furthermore, such expectations should also be further supported by measurement and monitoring, followed up by feedback and coaching (both positive and negative) to gauge performance, thereby visibly reinforcing the value and importance of food safety;

- **Ownership of safety** - Once food safety culture is established within an organisation, individual values of employees should begin to align with the cultural objectives of the organisation. The need to emphasise expectations and responsibilities, although not removed, reportedly gives rise to behaviours driven more by personal ownership: "*In organizations with enlightened food safety cultures, employees do the right thing not because the manager or customer is watching, but because they know it's right and they care.*"

- **Sharing of knowledge and information** – The willingness of people to openly discuss concerns and share differing opinions reportedly strengthens organisational culture, and engages employees bringing them closer together. Furthermore, through asking questions it is possible to gauge understanding, measure attitude, gather feedback and role model the desired ability to openly and honestly communicate. "*You can tell a lot about the food safety culture of an organisation by their communication or lack of communication on the topic."*

- **Regular communication and informatio**n relating to food safety serves to impart knowledge but also influences the action taken by employees in relation to food safety. Yiannas asserts that the use of personal testimonies can often be far more influential than the presentation of statistics when training or educating individuals on food safety. The listener is then able to relate to the information being *"given and is therefore more likely to act upon it".*

Yiannas appears to emphasise the need for organisational understanding of the way in which approaches are applied and behaviours displayed in order to draw upon successes of external agencies. Reference is made to the 20 occupational health and safety culture

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Conference Board, Research report retrieved January 26th 2012 from http://www.nsc.org/news_resources/Resources/Documents/Dept.%20of%20Defense%20-%20Driving%20Toward%200.pdf

practices outlined by Whiting and Bennett (2003)[23], which incorporate: practices and programme, managers' visible support for safety and health, front line supervisor responsibilities and employee involvement. Yiannas states that this "*oversimplifies food safety efforts*" and "...*approaches food safety like a criteria with a list of potential menu options without understanding how the various best practices might be linked together*..."

The authors of this report would note that Yiannas's advice and perceptions surrounding the creation of a food safety culture appear to be most suitable for medium and large organizations with multiple levels of management. Although, it is proposed that for an organisation to effectively create and maintain food safety culture, they must understand the value of each strategy and approach they intend to implement so that this can be monitored and approached in a way that influences employee thoughts and behaviour. Such advice could most usefully be applied to the development of food safety culture within SME and micro business.

Powell et al

Powell et al (2011) [24] report on three food safety case studies, the 2005 *E. coli O157:H7* outbreak in Wales; a 2008 *Listeria* outbreak in Canada that sickened 57 and killed 23; and a 2009 *Salmonella* outbreak in the United States linked to peanut paste that killed nine and sickened 691. The case studies show that "*creating a culture of food safety requires application of the best science with the best management and communication systems, including compelling, rapid, relevant, reliable and repeated food safety messages using multiple media*".

Powell et al state that food safety culture is grounded in shared values amongst staff and operators for safe food production. Knowing and understanding the risks associated with the business's practices and how to effectively manage them was reported to help businesses maintain a culture of food safety. Other indicators of good food safety culture included behaviours reflective of the shared values, and openness to challenge one another where food safety failings may occur.

The paper states that "By using a variety of tools, consequences and incentives, businesses can demonstrate to their staff and customers that they are aware of current food safety issues, that they can learn from others' mistakes and that food safety is important within the organization". These tools include compelling, rapid, relevant, reliable and repeated food safety messages using multiple media. Messages need to be compelling and based on evidence that can prove risk is reduced. This work highlights the role of risk communication and risk perceptions within an effective safety culture. They say that:

"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,"

The researchers suggested the following tips to creating good food safety culture:

- Know the risks associated with the foods they handle and how those should be managed;
- Dedicate resources to evaluate supplier practices;
- Stay up-to-date on emerging food safety issues;

[23] Whiting, M.A & Bennett, C.J. (2003) Driving toward "O". Best practices in corporate safety and health. The Conference Board. Research Report R-1334-03-RR

[24] Powell, D., Jacob, C. & Chapman B. (2011). *Enhancing food safety culture to reduce rates of foodborne illness*. Food Control. 22 (6) , 817-822.

- Foster a value system within the organization that focuses on avoiding illnesses;
- Communicate compelling and relevant messages about risk reduction activities, and empower others to put them into practice;
- Promote effective food safety systems before an incident occurs; and
- Do not blame customers, including commercial buyers and consumers, when illnesses are linked to their products.

Griffith et al

Griffith et al (2010)[25] examined the literature on health and safety culture and organizational culture, drawing upon constructs from other highly regulated industries in order to identify relevant components applicable to food safety.

Considering prior research on the topic, Griffith et al define negative safety culture as poor compliance with regulatory requirements and low perceptions of importance towards food safety in relation to other business priorities. By comparison, for positive food safety culture they state, "*food safety is an important business objective and there is compliance with documented systems*." As with a wide body of research into organisational culture, the importance of top management is emphasised with regards to understanding the role and responsibility which they have to play in creating and maintaining food safety culture.

A total of six indicators were identified to be appropriate for use in assessing food safety culture and performance:

- **Food safety management style and systems** – Griffith et al reported that an organisation's documented food safety management system should:
    - Outline aims supported by food safety objectives and information surrounding how such aims may be achieved;
    - Document operating procedures and practices influential to food safety;
    - Guide leadership and communication surrounding food safety.

  It is worth noting that Griffith et al acknowledge the differences present in organisations of different sizes and therefore accept that many safety management systems may be too resource intensive (in terms of staff and cost) for SMEs, stating "*one size is unlikely to fit all*". However, they highlight the need for all food businesses, regardless of size, to have a documented food safety system based upon HACCP principles. Furthermore, more than the systems alone, Griffith et al also highlight the need for management involvement to proactively drive the processes and systems forward with employees;
- **Food safety leadership** – The display of effective leadership through sharing goals and standards is reported as a means of influencing and motivating employees to follow a shared vision of safety. They state: "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." The paper outlines a number of different leadership styles each of which influence behaviour and gather support using a different approach. Perhaps more importantly, however, Griffith et al state that managers may well need to adapt their style of leadership in order to match the needs of situations and/or individuals and therefore a key characteristic

[25] Griffith, J., Livesey, K.M., Clayton, D. (2010) *The assessment of food safety culture*, British Food Journal, Vol. 112 Iss: 4, pp.439 – 456.

of an effective leader in the context of food safety appears to be adaptability. Furthermore, the importance of effective leadership both the top and middle levels of management are emphasised, although it is recognised that the scale and approach to leadership may differ;

- **Food safety communication** – Griffith et al propose that an effective communication policy is reported to consist of a range of communicative approaches, varying in terms of the level of formality, format and scale of delivery. Benefits identified included feelings of empowering and involvement of employees as well as helping to increase staff motivation and commitment to safety. The paper refers to two approaches to communication within an organisation. The first being 'approach intention', defined as employees' willingness to challenge unsafe behaviour of a colleague, suggested to be a positive indicator of safety culture. By contrast however, the second refers to 'blame culture' whereby individuals are 'named and shamed' for unsafe actions. It is this later approach which is said to be detrimental to open and honest organisational communication, preventing unsafe acts being reported, understood or avoided in future. Consequently, "Positive safety cultures are often characterised by employees who feel free to discuss safety issues with supervisors" (Hofmann & Morgeson, 1999, cited within Griffith et al 2010);
- **Food safety commitment** – The paper refers to three categories of commitment proposed by Greenberg and Baron (2008). Each category outlines a different reason for individuals' organisational commitment, these being financial drive, pressure from others and agreement with organisational practices. The later being the most desirable when seeking positive food safety culture, the importance of worker praise and recognition from leaders is reportedly key to their engagement with colleagues and commitment to food hygiene;
- **Food safety environment** – the organisational environment may refer to physical surroundings, such as the provision of wash basins and necessary equipment, or equally the presence of sufficient staff to be able to perform necessary tasks. The research suggests that the food safety environment is said to have a marked effect upon subsequent behaviour: "If sufficient facilities are available then there is support for safety but also if absent then food safety is perceived not to be important." (Hofmann & Morgeson, 1999, cited within Griffith et al 2010).It would therefore appear that the physical environment plays a large role in helping to set organisational expectation of behaviour and is therefore key to promoting a food safety culture in business;
- **Risk perception** – Risk perception is important, particularly if "the regulatory regime is perceived as fair, trusted and co-operative, this is likely to lead to greater compliance, although sanctions are still needed to back up a co-operative approach". An individual's assessment of the chance of being affected will often dictate their subsequent behaviour to mitigate the risk in question. Research into 'optimistic bias' and perceptions of control has found such factors to be detrimental to food handlers' food hygiene behaviour (Redmond & Griffith, 2009, cited within Griffith et al 2010). Effectively, implementation of food safety requirements are generally lower amongst organisations that recognise a risk but perceive this not to pose a threat to their business, or those believing that they adequately mitigate the risk identified already. Consequently, businesses and employees need to understand and believe the risk posed in terms of both severity and likelihood in order for them to implement mitigating food safety practices in accordance with

legislative requirements. Consequently food safety communication (as discussed above) can play a significant part in influencing employee perceptions of risk and therefore influence food safety behaviour.

Thus, it can be seen that the work of Griffith et al (2010) draws together the range of factors cited within other food safety culture research.

Institute of Employment Studies (2010)

The FSA commissioned an evidence review to investigate the culture and behaviours in businesses and enforcement bodies, and the communication between individuals in these two groups, to understand what works to secure regulatory compliance particularly, though not exclusively, in relation to food safety[26]. The review made the following conclusions:

- SMEs were shown to have lower rates of regulatory compliance than larger organisations across different areas including food safety. More specifically, “hotels and restaurants appear to account for more food poisoning outbreaks relative to other areas of the industry”. Citing the 2005 work of Fairman and Yapp, the report states that SMEs within the food sector “were more proactive about meeting requirements specifically required of them as the result of an inspection”;
- SMEs were judged to be less likely to dedicate internal resource or seek external support to understand and remain aware of current food safety issues with regards to business compliance. Consequently, in conjunction with other safety culture research, if an organisation fails to understand the risks and legislative requirements in relation with the practices of their business, they are unlikely to have the knowledge, motivation or expertise to prioritise actions to mitigate against such risks, nor assess the effectiveness of any action taken;
- Management promotion of safety is identified as a key driver of compliant behaviour across industries, alongside workforce engagement. More specifically, “In catering organisations, the role of the chef has been highlighted as pivotal in promoting positive safety cultures”. The report refers to the pivotal role which the Chef would often undertake within a food business, making decisions, and visibly demonstrating expectations of behaviour through their own conduct and positive attitude towards food safety;
- Time pressures were cited to affect SME organisational compliance within the food industry and is a barrier consistent with other food safety culture work summarised within this report (Yapp & Fairman, 2006). Amongst the reasons specified were availability to attend training, understanding legislative requirements and “Performance pressures can also lead workers to perceive the need for short-cut behaviours within their job”. This barrier of time to achieving compliance across industries is something which effective management and leadership can help to address through setting expectations, role modelling and providing constructive feedback;
- Evidence demonstrating the effectiveness of using multiple approaches to employee communication and feedback are reported from the health sector, particularly when encouraging complex behaviour such as hand washing. Therefore it would suggest that active promotion of food safety may have the greatest impact

[26] *Evidence review on regulation cultures and behaviours*, Institute of Employment Studies Cardiff Work Environment Research Centre. http://www.food.gov.uk/science/socsci/ssres/crosscutss/ssculturereview

upon behaviour if delivered through various channels including leadership and worker engagement;

- Evidence is presented with regards to the effectiveness of food hygiene training stating that “training appears ineffective in isolation, since it must be supported by commitment, motivation and management supervision”. Therefore it would appear that food safety behaviour and organisational compliance is unlikely to improve through the provision of training alone. When combined with feedback and reinforcement from within the business, however, training can considerably improve the likelihood of behaviour change (Worsfold et al, 2004 cited within Institute of Employment Studies Cardiff Work Environment Research Centre, 2010).

Key features of effective safety culture drawn from across different areas of compliance include:

- **Manager commitment** – Commitment and prioritisation of safety made clearly and consistently visible to employees in order to set expectations. Specifically with regards to food safety, “where managers value fast customer service or saving money more highly than hygiene, employees may regard good food safety practice as too time-consuming”;
- **Peer group support** – Compliance can be encouraged through the desire to behave in a way which is consistent with the social norms surrounding them. Therefore a desire for positive social recognition or avoidance of conflict may prompt legislative compliance. However, this is still the case in business with lower levels of compliance, whereby employees may well avoid actions which challenge the social norms surrounding them, even if such actions are in support of safety legislation;
- **Good staff communication and consultation** – “People are more willing to co-operate when they believe that the underlying laws or values are legitimate, and this may be more likely to be achieved when people are involved in forming those principles”;
- **Recognition of the fact that everyone has a role to play** – from board level through middle management and employees, the paper recognises that employees at all levels of a business have a role to play with regards to creating and maintaining safety culture. Manager commitment and leadership and the influence of staff communication and support, as already discussed, alludes to a holistic and inclusive approach to securing safety compliance as the most effective;
- **High-quality training** – Whilst on the job and formal training are noted means of increasing awareness and developing knowledge across different industries, the effectiveness of training in isolation is questioned when not supported by refresher learning, communication, peer support, feedback and reinforcement from the business (as already discussed above).

This work pulls together findings from different areas of compliance within a range of industries in order to propose suggestions of how to change culture within the food sector. It is worthy to note that this paper also echoed existing research in the field supporting the factors identified as influential to developing and maintaining food safety culture.

Yapp and Fairman

Research commissioned by FSA in (2004) [27] previously has included examination of effective enforcement approaches in SMEs including the development of a business compliance decision model.

The research highlighted a reactive/dependent trend amongst Small and Medium sized Enterprises (SMEs) who "saw ensuring compliance with the law as the responsibility of the local authority: the local authority identified and notified them of specific remedial action required." This was reportedly the case at most stages of the decision-making process, particularly regarding self-regulatory actions such as hazard analysis and monitoring temperature control.

The research reported that "SMEs tended to believe that their business complied with food safety legislation if they had implemented all requirements made by the environmental health practitioner (EHP) at the previous inspection". This is supported by comparative inspection rating scores, which were higher in areas of 'high' formal enforcement, than those areas with 'low' formal enforcement. Moreover, "SMEs did not evaluate their actions. If they believed that they had implemented what the EHP had told them to, then they considered themselves to be compliant".

The compliance decision model outlines steps which businesses take to achieve compliance with food safety requirements along with key barriers to SMEs undertaking them. These included:

- **A lack of motivation** to comply "due to a reactive attitude in dealing with food safety."
- **A lack of knowledge** relating to general food hygiene principles and hazard analysis, often found as a result of language barriers among SMEs where English is not employees' first language;
- **A lack of time** perceived as a barrier to meeting minimum legal requirements by SMEs in areas of "low" education level. In comparison, SMEs in areas of "high" education level, perceived time as a barrier to exceeding requirements;
- **A lack of money**, "particularly in dealing with structural compliance and training requirements";
- **Lack of trust** in the legislative system and environmental health practitioner's advice.

A large proportion of SMEs perceived food hygiene requirements as "'petty' and 'irrelevant' to the food safety of their business". Furthermore, "SMEs had a poor appreciation of food safety hazards inherent within their business operation. This lack of knowledge contributed towards a belief in many SMEs that they fully complied with food safety legislation". This may provide insight into why SMEs are more dependent on the regulator.

Reasons for non-compliance included failure to understand the requirements, disagreement with the requirements or preference for an alternative approach. With regards to actually implementing their compliance decision, "Where the requirements were understood and accepted, SMEs were more likely to meet or exceed the minimum requirements." This emphasises that in addition to attitude and motivation, businesses need to have sufficient knowledge and understanding of food safety requirements to be able to comply.

[27] http://www.food.gov.uk/multimedia/pdfs/e03003finalreport.pdf

Two key factors affecting SME motivation to comply with food safety requirements were:

- Legal duty to comply and fear of formal enforcement, particularly prominent amongst proprietors whose first language was not English;
- Commercial reasons, such as protecting the reputation of the company.

The researchers reported very few SMEs to be 'Amoral calculators', intentionally non-compliant in order to make money. Instead, they were perceived more to be 'Political citizens', believing that food safety requirements were unlikely to improve the food safety of their business; or 'organisationally incompetent' (Kagan & Sholtz, 1984 cited within Yapp and Fairman), resulting from a lack of knowledge and failure of management systems.

Within their 2005 work, Yapp and Fairman[28], conceptualise food safety compliance amongst SMEs as:

- "Heavily reactive decision making in which the enforcer is the predominant driver;"
- "Doing everything that had been asked of them at the previous inspection and that once this was done they were compliant";
- A process of negotiation between the business and regulator at a particular point in time, whereby knowledge of the regulation is believed to be unimportant;
- A means of protecting their business and its reputation.

Wright et al

Wright et al (2007)[29] undertook a phased research project to explore perceptions of regulations and food safety behaviours using a range of research methods, these being:

- Interviews with regulators to explore perceived effectiveness of regulatory requirements (N=9);
- A review of food safety literature;
- Interviews with various food businesses and associations exploring their food safety/hygiene motivations (N=47);
- Consumer focus groups exploring food safety behaviour and the factors which influence this;
- A postal questionnaire with food businesses (N=567).

Wright et al reported that amongst food businesses "satisfying customer demands and avoiding bad publicity of poor food safety are top ranked motivators, followed by legal obligations and EHOs' demands. Avoiding adverse enforcement, such as prosecution and being sued are lesser factors but still rated as between 'moderate' and 'great' factors."

The report links the influence of customer pressure on compliance decision making with a drive to achieve regulatory requirements, for example, an enforcement sanction against a company may damage reputation and impact upon customer selection. "Regulations play an important role in clarifying issues, providing common frameworks and giving legal certainty to businesses as well as regulating standards where customers lack the knowledge, ability or propensity to exercise choice and where businesses lack the knowledge or propensity to manage risks". Enforcement may therefore affect

[28] Yapp, C., Fairman, R., 2005. *Assessing compliance with food safety legislation in small businesses*, British Food Journal, 107 (3) pp. 150-161.

[29] Wright, M., McMahon, A., Norton Doyle, J. Smith, R., Ali, F. & Walker, O. (2007). *Compliance processes, costs and consultation strategies: Summary report for the Food Standards Agency*. FSA: Foodbase.

organisational compliance from more than one perspective.

Trust and respect for the regulations was identified as a factor affecting compliance: "Where people feel that decisions that affect them are fair, transparent and consistent this can also contribute to a sense of trust and respect that leads onto acceptance of requirements and collaborative working." Furthermore, business involvement in regulatory decisions and the opportunity to voice opinion were also found to influence trust and respect for the regulatory requirements. Subjective judgement is also reported to influence businesses' motivation to comply with specific aspects of food safety requirements. Wright et al state "food safety and hygiene is influenced by their perception of the substantiveness and significance of the risk, as well as their judgement of what is a proportionate standard of management. Businesses are less likely to be motivated to improve standards for specific risks that are considered to be trivial, in the absence of consumer demands."

Wright et al propose a concept of business compliance with four key influential factors, these being:

- **Relationships, trust and confidence** – the relationship and degree of trust a business has with the regulator will affect their confidence in the regulations and related advice/recommendations given to them. Opportunity to contribute to regulatory decisions and feelings of being listened to were also linked to perceptions of fairness and consistency along with greater acceptance of the requirements;
- **Regulatory drivers and support** – Drivers to regulatory compliance were often focused around the consumer in terms of protecting the image and reputation of the business in order to avoid lost trade. Exceptions to this included businesses with a low public profile, hazards not easily detected by consumers such as additives and where the customer base has low knowledge of food safety and hygiene;
- **Business knowledge and resource** - food businesses need to have knowledge and understanding of the regulations in order for them to be able to comply. It is important for the regulatory requirements to be proportionate to the resource a business feels they have available to achieve compliance;
- **Business incentives for voluntary improvement** – Factors outside of the regulatory enforcement were identified to improve compliance with food safety regulations. Amongst those cited were media reporting, brand image and reputation, public reporting of incidences.

Overall, the research findings are consistent with earlier research: "satisfying customer demands and avoiding bad publicity of poor food safety are top ranked motivators, followed by legal obligations and EHOs' demands. Avoiding adverse enforcement, such as prosecution, and being sued are lesser factors but still rated as between 'moderate' and 'great' factors."

EMC Food Sector Network

In a report[30] focused on the development of food safety culture, the EMC suggest a number of key elements thought to contribute towards positive organisational culture, including:

- Commitment from senior management: "they need to walk the talk and believe in the concept as much if not more so than every plant employee..... developing a "culture of food safety" means integrating it into *every* aspect of the organization as

[30] http://www.emccanada.org/blogs/emcfoodsec/emcfoodsectornetworkdevelopingacultureoffoodsafety

an integral business function - a function that has properly allocated resources, measurable goals and reporting requirements";

- Communication: "Communication opens the door for involvement and ideas - not only from within the plant but also from customers, suppliers and consumers." ;
- Shared responsibility: "From the moment raw material is ordered until consumption, every employee has an impact in some way at some time on that product.";
- Knowledge: gathered and shared in a number of ways including networking and training etc;
- Continuous improvement: "Establish good communication, develop idea and suggestion boards, encourage innovation, challenge the status quo, learn from others in industry and continually drive improvement opportunities!"

The article also encourages businesses to track and monitor their safety culture in order to identify and correct elements which are not working, track the impact upon the business and improve performance.

Angelillo et al[31]

In an Italian study of food handlers' knowledge, attitudes and behaviour, knowledge of food borne pathogens was found to be highest amongst those with higher levels of education, more experience and completion of educational courses (a finding echoed by Italo et al, 2001)[32] . Although positive attitudes were reported by the majority of food handlers, this was not however reflected in their reported safe practices.

In the opinion of the authors of this report, such results may indicate that whilst knowledge and understanding appear to be linked with positive food safety attitudes, this knowledge and attitude alone may not always transfer into safe food practices. This indicated that there may be further constructs which contribute to food safety culture.

2.3 Synthesis of research on food safety culture

There are at least two ways to segment elements of food safety culture, 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 outlined above would suggest that food safety culture can be said to have the following elements:

1. **Priorities and attitudes –** Food business's attitudes towards food safety and the degree to which food safety is prioritised within the organisation.
2. **Risk perceptions and knowledge**- 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. **Confidence in food safety systems** - the extent to which the business perceives the food hygiene regulations to be valid and effective.

[31] Angelillo IF, Viggiani NM, Rizzo L, Bianco A. (2000). *Food handlers and foodborne diseases: knowledge, attitudes and reported behaviour in Italy.* Journal of Food Protection. 63 (3), 381-5.

[32] Italo F. Angelillo , DDS, Nunzia M.A. Viggiani , MD, Rosa M. Greco , MD and Daniela Rito , MD (2001). *HACCP and Food Hygiene in Hospital: Knowledge, Attitudes, and Practices of Food services Staff in Calabria, Italy*. Infection Control and Hospital Epidemiology , 22 (6) 363-369

4. **Ownership** - The extent to which they see food hygiene to be the responsibility of the regulator and adopt a reactive approach, as opposed to accepting that the business is responsible for taking a lead in food safety.
5. **Competence** - Knowledge and understanding of the risks and subsequent risk management throughout the organisation.
6. **Leadership** – The extent to which there is clear and visible commitment and leadership of food safety from management.
7. **Employee involvement** - The extent to which there is involvement, ownership and accountability for food safety across staff at all levels of the business.
8. **Communications** - The extent to which there is open communication and freedom to challenge and discuss practices.

Some of the research findings suggest that the level of agreement with legislative requirements will affect the organisation's willingness and motivation to comply. By introducing a positive safety culture incorporating the elements outlined above, this should ensure that businesses have an understanding of food safety requirements as well as the knowledge, motivation and skill to effectively manage food safety risks. This is particularly important for SMEs where compliance is, at present, often driven by the regulator and motivations to change are commercially, as opposed to safety, driven.

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

a) **Amoral calculators**: Intentionally breach regulations for the sake of financial gain, disputing or disregarding risk to people;

b) **Dependent:** 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;

c) **Doubters:** 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;

d) **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";

e) **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.

There is insufficient research in the area of food safety to indicate whether businesses progress through these typologies in a sequence over time, or whether it is necessary to move through them from a) to e). Therefore, they are presented here as typologies that a business may be categorised by.

3 SEARCH AND SHORTLISTING OF SAFETY CULTURE TOOLS

3.1 Search method

3.1.1 Sources and exclusion criteria

Searches for relevant literature were undertaken in the following 11 databases:

- Science Direct;
- OSHLINE®;
- NIOSHTIC®;
- NIOSHTIC-2;
- HSELINE;
- CISLO;
- Canadiana;
- The UK Health and Safety Executive;
- The UK IOSH research database;
- Google Scholar;
- The National Patient Safety Agency.

Prior to commencing the search, the researchers agreed, with approval from the FSA, a stringent set of search criteria. These are as follows:

1. Output must relate to at least one of the areas of safety specified, these being occupational health and safety, process safety, food safety and hygiene, environment and/or patient safety.
2. Search articles and tools retrieved should relate to either safety climate or safety culture (and may include but not be restricted to key performance indicators, inspection and audit tools).
3. Research/documentation from 1990 to the present day.
4. Output must be presented in English language.

Pertinent key words were searched in each of the databases in order to obtain relevant results. Key search terms combined the topics, industries and type of documentation sought, as outlined within Table 2. The researchers also combined search techniques, adapting these to the capacity of each database, in order to gather both relevant and inclusive output. Search techniques included the use of Boolean logic, parenthesis and wildcard quotes. Whilst exclusions were specified at the outset of the search, the researcher specified such exclusions within databases only when this was believed not to restrict the output generated. For example, specifying a restriction of English Language papers only in some databases excluded relevant papers which were written in English, but had failed to specify this explicitly within the database.

Table 2: Search terms utilised

Safety Occupational health Food	With	Culture Climate Norms	with	Research Tool Method Assessment Measure Indicator Validation Evaluation Diagnosis

The depth and output generated by the searches conducted in each of the databases is summarised in Appendix A: Database search .

3.1.2 Shortlisting criteria

The criteria used to short-list papers for detailed review were as follows:

1. Application in business, (particularly in micro and small businesses).
2. Provides a means for categorization of culture and attitudes.
3. Focused on a means of giving advice and toolkits. (Where possible used by inspectors).
4. To cover a range of areas of safety rather than just personal safety, such as patient safety, rail safety and aviation.

All shortlisted tools had to have been applied to businesses. As this project aimed to develop a toolkit that includes advice on how to improve safety culture, selection was focused on toolkits that mapped advice onto assessments of safety culture.

3.1.3 Shortlisted papers

A total of 169 questionnaires and tools were identified as listed in Appendix B: . A large number of these were variations of safety climate questionnaires and had been used in safety culture research.

Having implemented the criteria outlined above, 15 toolkits/questionnaires were shortlisted for potential inclusion in the detailed review. These are outlined below:

1. Keil Centre: Safety Culture Maturity® model;
2. RSSB: Safety Culture Toolkit;
3. Loughborough University: Safety Climate Assessment Toolkit;
4. Energy Institute & Shell: Hearts and Minds;
5. HSE: Leadership and Worker Engagement Toolkit;
6. HSE: Human Factors Inspectors' Toolkit;
7. Euro Control Safety Culture Toolbox;
8. Serco: Assurance Safety Culture Assessment Tool;

9. Aberdeen University: Offshore Safety Questionnaire;
10. Her Majesty's Railway Inspectorate (HMRI) (now office of Rail Regulation): Safety Culture Inspection Toolkit;
11. Fleming, M. (2005): Patient Safety Culture Measurement and Improvement: A "How To" Guide;
12. British Safety Council: Safety Culture Toolkit;
13. Manchester University: Manchester Patient Safety Framework (MAPSAF).

The researchers made exceptions to allow for the inclusion of two well established tools, prominent in their respective industries, namely:

14. HSL Health and Safety Climate Survey Tool;
15. Nordic Safety Climate Questionnaire (NOSACQ-50).

These two tools focus upon the measurement of safety climate as opposed to providing on a means of categorizing culture and attitudes.

In each case the organisation responsible for the tool was contacted with a request for:

- A copy of the question set;
- Copies of any research regarding the validation, reliability and effectiveness of the tool;
- The approximate number of business it had been applied in;
- Whether it had been specifically applied to micro and small businesses.

A rapid internet search was also completed to identify relevant research and information on each tool.

Feedback indicated that the Serco tool was no longer available and so this tool was not considered further. Information was not acquired on the RSSB safety culture toolkit or the British Safety Council toolkit within the timescale of this project and so they were not considered further.

Sufficient information was available for all other techniques to enable their consideration in this study. In some cases the specific questions were not available due to commercial restrictions however in these cases information was available on the elements assessed and design of the tool.

4 REVIEW OF SAFETY CULTURE TOOLS

4.1 Approach

The review of tools aimed to compare the methods against one another to assess:

- Extent of commonality;
- Extent to which they address a common range of cultural factors;
- Extent the method may meet the needs of food hygiene inspectors and are applicable to food businesses.

Review Criteria

The following criteria were used for the review:

- **Generic or sector specific**. The extent to which the tool is developed for a specific sector or for application across a range of sectors, including food safety;
- **Type of tool**. The extent to which the tool is used by inspectors or for self administration by businesses, looks to diagnose or profile culture and utilises an approach that can be used in face to face interactions, such as open questions and guidance and advice mapped to results;
- **Validity and reliability**. The extent to which there is evidence that the tool accurately measures safety culture in a consistent way; the questions measure the constructs they are mapped to and scores on the tool correlate with or predict other measures of safety performance;
- **Application**. The extent to which there is evidence that the tool has been applied in practice rather than for research purposes;
- **Effectiveness**. The extent to which there is evidence that the tool has helped businesses enhance their safety culture;
- **SME specific**. The extent to which there is evidence that the tool has been applied or developed for use in SMEs, particularly micro and small businesses.

4.2 Discussion of findings

4.2.1 Overview

Table 7 provides a summary of the reviewed tools. Table 8 provides a summary of typologies and elements used by the reviewed tools.

The review of the current tools noted that:

- None of the tools had been developed specifically to assess food safety culture. There are examples of tools that have been amended to a specific sector, such as rail, or area of safety such as patient safety. This indicates a precedent for needing to amend tools for new areas, such as food safety in this case;
- The typologies used for some tools and elements of safety culture covered in existing tools overlap with those noted in food safety culture research but do not cover all of them;
- Most tools have not been developed specifically for application to micro or small firms. Only the HSE Leadership and Worker Engagement Toolkit, has been developed for SMEs, while the HSE HF toolkit and Primary Care version of Manchester Patient Safety Framework (MAPSAF) has been applied to SMEs;

- Most tools have been developed in context of larger firms and often use terms and phrase questions that are suited for larger businesses;
- Many of the existing safety culture tools have some form of validation, most notably construct validity. The elements these tools assess are consistent with the results of research into the factors that comprise safety culture. However, there is little evidence regarding the repeat measure reliability of tools. Also there is little substantive evidence regarding the effectiveness of tools, with most evidence comprising case studies and anecdotal feedback;
- A large majority of the tools are diagnostic in nature, such as the Manchester Patient Safety Framework (MAPSAF), Keil Centre Safety Culture Maturity® Model, Hearts and Minds and HSE Leadership and Worker Engagement Toolkit. These tools also exemplify a way of categorizing businesses' safety culture in a way that can be mapped on advice;
- A majority of the tools use a triangulation of methods to explore culture and utilise workshops or a toolkit based approach and are examples of how tools can be designed for use in a face to face session;
- The majority of the tools are used for self application by businesses. Two tools have been developed for use by inspectors within the setting of site inspections, namely the HSE's Human Factors toolkit (which has a safety culture section) and the Office of Rail Regulation safety culture toolkit. These tools also map from assessments to advice on how to improve safety culture. They provide examples of a design for a food safety culture toolkit for use by food hygiene inspectors;
- The majority of the tools do not use typologies. Rather they are structured around a number of elements. In almost all cases the maximum number of elements measured is 10, with minimum of 5;
- Several tools (for example, Keil Centre Safety Culture Maturity® Model; Hearts and Minds; Manchester Patient Safety Framework (MAPSAF) use typologies. These tools use no more than 5 typologies;
- A number of tools, such as the Safety Climate Assessment Tool are intended for completion as a survey of staff and measure safety climate rather than specifically diagnose culture and mapped advice. This is not considered applicable by inspectors during "routine" inspections of micro or small food businesses;
- Some models presume that safety is driven by a wish to prevent accidents rather than avoid compliance with regulations. This presumption is not appropriate for a tool aimed at portraying business cultures which might be amoral.

4.2.2 Typologies

Five of the tools reviewed use a typology approach to investigate culture, namely:

- Keil Centre: Safety Culture Maturity® model;
- Energy Institute & Shell: Hearts and Minds;
- HSE: Leadership and Worker Engagement Toolkit;
- Fleming, M. (2005): Patient Safety Culture Measurement and Improvement;
- Manchester University: Manchester Patient Safety Framework (MAPSAF).

For these tools, a set of elements, (for example management commitment, workforce engagement) are explored and assessed to help determine the typology that applies to the business. The typology is used to categorise culture.

Advice and guidance can then be mapped to the typology as is the case for the HSE: Leadership and Worker Engagement Toolkit. The aim is to help ensure that the advice and guidance provided is suitable for the business and their current level of culture.

In the majority of cases, the exploration of the elements and categorization is carried out in a qualitative manner, using techniques that utilize face to face interactions, rather than employee based surveys. These tools therefore provide examples of a design for a food safety culture toolkit for use by food hygiene inspectors.

Moreover, these tools use five typologies and therefore, if a typology approach is to be utilised for the food safety toolkit, it is suggested the number of typologies should not exceed five.

Three of the five tools (Energy Institute & Shell: Hearts and Minds; Manchester University: Manchester Patient Safety Framework (MAPSAF) and Patient Safety Culture Measurement and Improvement) exhibit commonality in the typologies used as indicated in Table 3. This occurs because, firstly the tools draw on the theory of cultural maturity and secondly two of the tools have the same authorship (Energy Institute & Shell: Hearts and Minds and Manchester University: Manchester Patient Safety Framework (MAPSAF).

Table 3: Common typologies for reviewed tools[33]

Most common typologies	Example statement to describe typology[34]
1. Pathological 2. Reactive 3. Bureaucratic/Calculative 4. Proactive 5. Generative	1. “Unless I get caught I’m not worried” 2. “I’ll worry about it when it happens” 3. “I do it because I have to” 4. “I do it because I want to” 5. “I do it without thinking”

It should also be noted that the:

- Keil Centre: Safety Culture Maturity® model use a distinct set of maturity levels that is based on their Safety Culture Maturity® model;
- HSE: Leadership and Worker Engagement Toolkit, uses phrases, such as “Unless I get caught I’m not worried”, or “I do it because I want to” to categorise businesses.

Theories of culture maturity often imply that businesses move through a sequential set of levels as their maturity enhances. Safety culture tools utilising such models can therefore help the business move through these levels. As previously noted the food safety culture research is inadequate to suggest whether businesses move through sequential levels of

[33] Relevant references for the tools are provided in Table 7

[34] Statements taken from the HSE: Leadership and Worker Engagement Toolkit. HSL (2011) *Development of a web-based Leadership and Worker Engagement (LWE) Toolkit for small and medium enterprises in construction.* HSE

culture. Therefore, we would not make any such assumption. However, food safety culture research does indicate a set of food safety culture typologies and hence a typology approach could be relevant to food safety.

Indeed, there is some overlap between the food safety typologies identified through research and the typologies used by the safety culture tools reviewed for this project as shown in Table 4.

Table 4: Potential typology comparison[35]

Common safety culture typologies	Food safety typologies drawn from the research
1. Pathological	1. Amoral calculators
2. Reactive	**2. Dependent**
3. Bureaucratic/Calculative	**3. Doubters**
4. Proactive	**4. Proactive compliers**
5. Generative	**5. Leaders**

It can be noted that:

- The Reactive and Dependent typologies have similarities with regard to the influence of an inspector/regulator;
- The Proactive and Leader typologies have similarities in regard to leadership and the drive for continued improvement.

Also, the bureaucratic/calculative typology may relate to two food safety typologies – Doubters and Proactive Compliers.

This may be because a bureaucratic/calculative culture may doubt the significance of certain practices, in a similar manner as the Doubters. However, a bureaucratic/calculative culture is also likely to implement systems that ensure compliance with standards, rather than strive to meet and exceed best practice, in a similar manner to Proactive Compliers.

4.2.3 Elements

All the tools reviewed assessed/explored culture using a set of elements. The number of elements ranged from 5 to 10 elements. Only one tool exceeds 10 elements. It is therefore suggested that for the food safety toolkit, the number of elements assessed/explored should not exceed 10.

The elements can either help categorise safety culture, using typologies or be used to profile a culture.

Of particular relevance to the food safety toolkit is the use of typologies combined with element descriptors. This is because advice and guidance can be mapped to the typology and focused on elements.

Based on the review, there are a number of common elements that are assessed/explored across the tools. These are shown in Table 5 and are in line with previous research that has identified common features.[36] [37]

[35] Relevant references for the tools are provided in Table 7

[36] R.Flin, K. Mearns, P. O'Connor, R. Bryden (2000) *Measuring safety climate: Identifying the common*

Table 5: Common elements for reviewed tools[38]

Common elements
1. Management/leadership commitment
2. Communication
3. Involvement
4. Learning
5. Priorities
6. Risk perceptions
7. Attitude
8. Competence (including training)

Moreover, the elements of safety culture covered in existing tools overlap with those noted in food safety culture research but do not cover all of them. This is indicated in Table 6.

Table 6: Potential element comparison[39]

Common elements of safety culture covered in reviewed tools	Food safety elements drawn from the research
1. Management/leadership commitment	**1. Leadership**
2. Communication	**2. Communication**
3. Involvement	**3. Employee Involvement**
4. Learning	**4. Risk perceptions**
5. Risk perceptions	5. Confidence in food safety systems
6. Priorities	**6.** Ownership
7. Attitude	**7. Priorities and attitudes**
8. Competence (including training)	**8. Competence (including training)**

features. Safety Science 34.

[37] Cooper, M. & Philips, R. (2004). Exploratory analysis of the safety climate and safety behaviour relationship. Journal of Safety Research, 35, 497-512.

[38] Relevant references for the tools are provided in Table 7

[39] Relevant references for the tools are provided in Table 7

Table 7: Summary of reviewed tools

Tool name and author	Sector or generic	Type of tool	Validity and reliability			Approx extent of application	Evidence of effectiveness	SME specific version/ applicable
			Predictive	Construct	Reliability			
Safety Climate Tool: Health and Safety Laboratory[40]	Generic	Profiling Employee survey based tool For self application by businesses	No evidence identified or supplied	Yes[41] Identification of 40 statements mapped to 8 factors of Safety Culture	Yes[42] 6 factors demonstrated reliability. 2 factors demonstrated questionable reliability.	Tool administered to thousands	Case study evidence	No SME specific version
Safety Culture Maturity® model. Keil Centre[43]	Generic	Diagnostic (maturity) Workshop based tool For self	Yes[44] Scales correlated with measures of occupational health and safety and	Yes[45] Factorial validity identified	Yes[46] High level of reliability demonstrated in scales	Tool administered to hundreds	Case study evidence	No evidence of SME version

[40] C.Sugden, M. Marshall, S. Binch & D Bottomley (2009) *The development of HSL's Safety Climate Tool – A revision of the health and safety climate tool.* Contemporary Ergonomics. P 245-252

[41] As above

[42] As above

[43] The Keil Centre (2000) *Safety Culture Maturity® Model. Offshore technology Report*. HSE Books

[44] R.Lardner, P McCormick & E Novatsis (2011) *Testing the validity and reliability of a safety culture model using process and occupational safety performance data.* Presented at IChemE Hazards XXII conference

[45] As ref 42

[46] As ref 42

Tool name and author	Sector or generic	Type of tool	Validity and reliability			Approx extent of application	Evidence of effectiveness	SME specific version/ applicable
			Predictive	Construct	Reliability			
		application by businesses	process safety					
Loughborough University: Safety Climate Assessment Toolkit. Cheyne, A.J., Cox, S.J[47] [48]	Specific to high hazards	Diagnostic Toolkit (questionnaire, interviews and documentation) For self application by businesses	No evidence identified or supplied	No evidence identified or supplied	No evidence identified or supplied	Approx 50 organisations As tool is in the public domain the number of users is unknown	No evidence identified or supplied	No SME specific version
Safety Culture Toolbox. Euro Control[49]	Specific to Aviation	Diagnostic Toolkit (Questions and workshop) Guidance provided (how to use the results to enhance culture)	No evidence identified or supplied	Yes[50] Identification of 8 factors of safety culture	No evidence identified or supplied	Approx 20 organisations	Anecdotal evidence and case study evidence	No SME specific version

[47] S.J. Cox, A.J.T. Cheyne (2000) *Assessing Safety Culture in Offshore Environments*. Safety Science 34. 111-129

[48] Loughborough University: *Safety Climate Measurement. User guide and toolkit.*

[49] B. Kirwin, K Mearns & S Shorrock (2012) *The EUROCONTROL Safety Culture Questionnaire: Lessons from Application.*

[50] B. Kirwin, K Mearns, S Shorrock & C. Laing (2012) Developing a Safety Culture Questionnaire for European Air Traffic Management: Learning from Experience

Tool name and author	Sector or generic	Type of tool	Validity and reliability			Approx extent of application	Evidence of effectiveness	SME specific version/ applicable
			Predictive	Construct	Reliability			
		For self application by businesses						
Hearts and Minds: Energy Institute & Shell[51]	Specific to Energy Industry	Diagnostic Toolkit (Questions and workshop) Guidance provided (how to use the results to enhance culture) For self application by businesses	No evidence identified or supplied	No evidence identified or supplied	No evidence identified or supplied	Hundreds	Case study evidence and anecdotal	No SME specific version
Leadership and Worker Engagement Toolkit. HSE[52]	Currently aimed at construction but typologies and elements are	Diagnostic Toolkit (statements)	No evidence identified or supplied	Yes - Qualitative construct validity and face validity[53]	Yes[54] High level of internal consistency	17 companies during piloting (13 SMEs) as part of the	No evidence identified or supplied	Yes

[51] Shell and the Energy Institute. Hearts and Minds

[52] HSE (2011) *Leadership and Worker Involvement toolkit*. Leadership and Worker Engagement Forum

[53] Bell. N, J. Hopkinson, V. Bennett & J. Webster (2011) *Development of a web-based Leadership and Worker Engagement (LWE) Toolkit for small and medium enterprises in*

Tool name and author	Sector or generic	Type of tool	Validity and reliability			Approx extent of application	Evidence of effectiveness	SME specific version/ applicable
			Predictive	Construct	Reliability			
	designed around generic best practice for Leadership and workforce engagement	Guidance and advice specific to the typologies For self application by businesses		Participating experts indicated the tool to be a good measure of safety culture and the 6 buildings blocks appropriate	demonstrated. 6 building blocks demonstrated test-re-test reliability. 2 building blocks demonstrated lower levels of reliability (although still statistically significant)	development[55] As an online tool the number of users is unknown		
HF Toolkit. HSE[56]	Major High hazards	Diagnostic Toolkit (questions) Guidance and advice For use by inspectors during inspections	No evidence identified or supplied	No evidence identified or supplied	No evidence identified or supplied	Judged to be in the order of tens (but no tracking of uses)	No evidence identified or supplied	Yes

construction. HSE

[54] As above

[55] As above

[56] HSE (2005) Inspectors Toolkit. *Human factors in the management of major accident hazards*.

Tool name and author	Sector or generic	Type of tool	Validity and reliability			Approx extent of application	Evidence of effectiveness	SME specific version/ applicable
			Predictive	Construct	Reliability			
Nordic Safety Climate Questionnaire (NOSACQ-50). Kines, P[57]	Generic	Diagnostic Employee survey based tool For self application by businesses	Yes[58] Evidence of predicting safety motivation, perceived safety level, and self-rated safety behavior	Yes[59] Identification of 7 factors of safety climate	Yes[60] High level of internal consistency demonstrated	Approx 25 Questionnaire is in public domain	Case study	No SME specific version
Offshore Safety Questionnaire. Aberdeen University[61]	Offshore oil and gas	Profiling Employee survey based tool	Yes[62] Scales: Perceived management	Yes[63] Identification of 6 factors	Yes[64] Similar factor structured emerged across testing in	Judged to be in the order of hundreds (but no tracking of	No evidence identified or supplied	No SME specific version.

[57] P Kines et al (2011) Nordic Safety Climate Questionnaire (NOSACQ-50): *A new tool for diagnosing occupational safety climate*. International Journal of Industrial Ergonomics. 41. 634-646

[58] As above

[59] As 55

[60] As 55

[61] University of Aberdeen, School of Psychology (2002) Offshore Safety Questionnaire

[62] K. Mearns, S Whitaker, R. Flin, R Gordon & P. O'Connor (2003) *Factoring the human into safety. Translating research into practice. Benchmarking human and organisational factors in offshore safety.* HSE Books

[63] As ref 60

Tool name and author	Sector or generic	Type of tool	Validity and reliability			Approx extent of application	Evidence of effectiveness	SME specific version/ applicable
			Predictive	Construct	Reliability			
		For self application by businesses	Commitment to safety, Willingness to report accidents and Perceived supervisor competence predicted self-reported accidents. Although authors indicate stability of the predictive power needs further research		year 1 and year 2.	uses)		
Manchester Patient Safety Framework (MAPSAF). Manchester University[65]	Patient Safety	Diagnostic Workshop based For self application by businesses	No evidence identified or supplied	No evidence identified or supplied	No evidence identified or supplied	Judged to be in the order of tens (but no tracking of uses)	Case study	No SME specific version. Primary care version applied to SMEs

[64] As ref 60

[65] D. Parker. The University Of Manchester (2006) The Manchester Patient Safety Framework (MaPSaF)

Tool name and author	Sector or generic	Type of tool	Validity and reliability			Approx extent of application	Evidence of effectiveness	SME specific version/ applicable
			Predictive	Construct	Reliability			
Safety Culture Inspection Toolkit. Her Majesty's Railway Inspectorate (HMRI) (now Office of Rail Regulation)[66]	Rail	Diagnostic Toolkit (questions and scenarios) Guidance and advice For use by inspectors during inspections	Usability tested[67] - No evidence identified or supplied of predictive validity	Usability tested[68] - No evidence identified or supplied of construct validity	Usability tested [69] No evidence identified or supplied of reliability	Judged to be in the order of tens (but no tracking of uses)	No evidence identified or supplied	No SME specific version.
Patient Safety Culture Improvement Tool. M Fleming & N Wentzell[70]	Patient Safety	Diagnostic Employee survey based tool For self application by businesses	No evidence identified or supplied	No evidence identified or supplied	No evidence identified or supplied	As tool is in the public domain the number of users is unknown	No evidence identified or supplied	No SME specific version.

[66] Human Engineering (2005) *Development and validation of the HMRI safety culture inspection toolkit*. Prepared for the HSE. HSE Books

[67] as ref 64

[68] As ref 64

[69] As ref 64

[70] M. Fleming & N. Wentzell (2008) Patient Safety Culture Improvement Tool. *Development and Guidelines for Use*. Healthcare Quarterly. Vol 11.

Table 8: Summary of typologies and elements for reviewed tools[71]

Tool name and author	Typology	Elements
Safety Climate Tool: Health and Safety Laboratory	N/A	1. Organisational commitment and communication. 2. Line management commitment. 3. Supervisors' role. 4. Personal role. 5. Workmates' influence. 6. Competence. 7. Risk taking behaviour and some contributory influences. 8. Some obstacles to safe behaviour. 9. Permit-to-work systems. 10. Reporting of accidents and near misses.
Safety Culture Maturity® model. Keil Centre	1. Emerging. 2. Managing. 3. Involving. 4. Cooperating. 5. Continually Improving.	1. Visible management commitment. 2. Safety communication. 3. Productivity versus safety. 4. Learning organisation. 5. Participation in safety. 6. Health & safety resources. 7. Shared perceptions about safety. 8. Trust between management and frontline staff. 9. Industrial relations and job satisfaction. 10. Safety training.
Loughborough University: Safety Climate Assessment Toolkit.	N/A	1. Management Commitment. 2. Communication. 3. Priority of safety.

[71] References for the tools are provided in Table 7

Tool name and author	Typology	Elements
		4. Safety rules and procedures. 5. Supportive environment. 6. Involvement. 7. Personal. 8. Priorities and Need for Safety. 9. Personal Appreciation of Risk. 10. Work. 11. Environment.
Safety Culture Toolbox. Euro Control	N/A	1. Management commitment. 2. Resourcing. 3. Reporting, Learning and Just Culture. 4. Risk awareness. 5. Teamwork. 6. Communication. 7. Involvement. 8. Responsibility.
Hearts and Minds: Energy Institute & Shell	1. Pathological. 2. Reactive. 3. Calculative. 4. Proactive. 5. Generative.	1. Leadership and commitment. 2. Policy and strategic objectives. 3. Organisation and responsibility. 4. Hazards and effect management. 5. Planning and resourcing. 6. Implementing and monitoring. 7. Audit. 8. Review.

Tool name and author	Typology	Elements
Leadership and Worker Engagement Toolkit. HSE	1. "Unless I get caught I'm not worried". 2. "I'll worry about it when it happens". 3. "I do it because I have to". 4. "I do it because I want to". 5. "I do it without thinking".	1. Commitment. 2. Workforce engagement. 3. Prioritisation of health and safety. 4. Compliance. 5. Measurement. 6. Organisational learning.
HF Toolkit. HSE	N/A	1. Management commitment. 2. Communication. 3. Employee involvement. 4. Training/information. 5. Motivation. 6. Compliance with procedures. 7. Learning organisation.
Nordic Safety Climate Questionnaire (NOSACQ-50). Kines, P	N/A	1. Management safety priority and ability. 2. Management safety empowerment. 3. Management safety justice. 4. Workers safety commitment. 5. Workers safety priority and risk non-acceptance. 6. Peer safety communication, learning, and trust in safety ability. 7. Workers trust in efficacy of safety systems.
Offshore Safety Questionnaire. Aberdeen University	N/A	1. Workforce involvement in health and safety. 2. Communication about health and safety. 3. Satisfaction with safety activities. 4. Attitudes to safety. 5. Work pressure. 6. Self-reported safety behaviour.

Tool name and author	Typology	Elements
Manchester Patient Safety Framework (MAPSAF). Manchester University	1. Pathological. 2. Reactive. 3. Bureaucratic. 4. Proactive. 5. Generative.	1. Continuous improvement. 2. Priority given to safety. 3. System errors and individual responsibility. 4. Recording incidents. 5. Evaluating incidents. 6. Learning and effecting change. 7. Communication. 8. Personnel management. 9. Staff education. 10. Teamwork.
Safety Culture Inspection Toolkit. Her Majesty's Railway Inspectorate (HMRI) (now Office of Rail Regulation)	N/A	1. Leadership. 2. Two-way communication. 3. Employee involvement. 4. Learning culture. 5. Attitudes towards blame.
Patient Safety Culture Improvement Tool. M Fleming & N Wentzell	1. Pathological. 2. Reactive. 3. Bureaucratic. 4. Proactive. 5. Generative.	1. Patient safety leader education and training. 2. Patient safety leader performance evaluation. 3. Workload. 4. Fatigue management. 5. Training. 6. Organisational learning. 7. Incident reporting. 8. Disclosure. 9. Safety analysis systems

5 INITIAL CONCEPT FOR FOOD SAFETY CULTURE TOOL

5.1 Overview

The key principles guiding the development of a food safety culture diagnostic tool were that it should:

- Be applied by food hygiene inspectors during inspections;
- Not require extensive employee questionnaire surveys;
- Be applicable to micro and small businesses in addition to larger businesses;
- Avoid any cultural bias in its questions;
- Be specific to food safety and the application of key techniques, such as HACCP;
- Provide a means of mapping from assessment results to advice on how to improve safety culture.

Moreover, for a toolkit to be successfully applied to micro and small business (e.g. HSE Leadership and Worker Engagement Toolkit, HSE HF toolkit and Primary Care version of Manchester Patient Safety Framework (MAPSAF) it needs to:

- Be a qualitative tool that can aid categorisation but does not require questionnaires and statistical analysis;
- Be used to structure a conversation and exploration of attitudes and behaviour;
- Consist of categorise and elements that are not specific to the structure of large organisations;
- Provide simply advice to enable improvement.

The initial concept was therefore:

- To have 5 to 6 main headings to categorise businesses in relation to their attitude and approach to food safety management (`category`), drawn from food safety culture research, and to provide definitions of these;
- To have up to 10 elements / indicators per category that can, optionally, be used to produce a more detailed assessment of a business culture;
- To generate categorisation through discussion, thus ensuring it is a qualitative tool;
- To develop categories and elements that are generic across all organisational structures;
- To provide advice on improvements mapped to these categories;
- For the categories and sub elements to be presented in an A3 page, with advice on a back page.

5.2 Guidance to identify categories

It was envisaged that the tool would include some guidance to help the inspectors explore food safety culture and the associated elements during their inspection and identify the relevant category to describe the business culture.

The guidance to inspectors covered three areas:

- A set of key open questions to ask. There are eight questions, one question for each food safety culture element;

- Example documentation to review as part of the inspection, to understand food safety and hygiene practices and;
- Example observations that can be made by the inspector, to help understand food safety and hygiene behaviours within the business.

Questions to ask

The following questions could be asked to help explore elements contributing to food safety culture:

Priorities and attitudes:

1. What are your key business priorities?
2. What are the things that are most important for your business to succeed?
3. To what extent is food safety and hygiene a critical success factor for your business?

Food hygiene risk perceptions & knowledge:

4. If businesses like yours did not comply with food hygiene and food safety regulations, do you think that this would create a significant possibility of customers getting food poisoning?
5. To what extent do you think that the risk to your customers of food poisoning or other forms of harm justify current food hygiene and safety regulations?

   For staff:

6. What food safety risks are present within your business and what impact do you believe they can have? Or – For your business, what can make your products unsafe for consumers to eat? How might this affect your business? How might this affect the consumer?

Confidence in food hygiene and safety requirements:

7. ‘How necessary do you think (practice x) is for preventing food poisoning or other food safety problems?
8. How valid and appropriate do you think food hygiene and safety regulations are, with respect to the food risks in your business?
9. Would you consider food hygiene and safety regulations to be a nuisance, impractical, unnecessary, ineffective, over the top or necessary, appropriate and effective?

Business ownership of food hygiene:

10. Can you provide examples of changes in your food hygiene and safety practices over the last year? Who decided on these changes and what prompted these changes?
11. Who is responsible for determining how to prevent your food from being unsafe?
12. Who is responsible for deciding how to improve food safety and hygiene practices in your business?
13. How often do you review and update your food hygiene and safety practices?
14. When was the last time you reviewed or changed food hygiene and safety practices? What prompted this?
15. How reasonable is it for the regulator to expect a business like yours to take

responsibility for understanding and complying with food safety and hygiene regulations?

Competence, learning, training, knowledge etc:

16. How do you develop your staff's food safety and hygiene competence and knowledge?
17. What do you/ does your business do to help your staff know about what makes food unsafe?
18. What do you/ does your business do to help staff understand what they need to do to ensure food is safe for consumers/customers?
19. 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?
20. To what extent would you say that food hygiene and safety is common sense?
21. Is it safe to assume that your staff understand the food hygiene hazards in your business and understand good practice?

Leadership on food hygiene:

22. What do you do to encourage good food hygiene and safety practices amongst staff?
23. How do you encourage staff to behave correctly/follow the rules for food safety when they are handling food?
24. What do you do to ensure you set a good example in following food hygiene and safety rules?

Employee engagement in review & development of food hygiene practices:

25. 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?
26. Can you provide an example of how staff are involved in reviewing food hygiene practices and deciding on improvements?
27. Do you think that staff have enough experience and expertise to help identify how to improve food hygiene and safety practices?
28. How often do you meet with staff to get their opinion on how to improve food hygiene and safety practices?

Communications & trust to engage in food hygiene & report issues:

29. How do you communicate food safety and hygiene good practices to your staff?
30. How do staff report issues with food safety?
31. What do staff do when they find a problem that might affect the safety of the food. How do they report it?
32. What do you say to staff when they report a food hygiene problem?
33. What would you do if one member of staff reported to you that another member of staff had failed to follow the rules for food safety/hygiene?
34. What information do staff get to help them understand how well the business is performing with respect to food hygiene and safety?

Documents to review

The following are examples of documentation that could be reviewed as part of the food safety culture discussion:

1. Documented food safety management system (based upon HACCP as required by law); e.g. HACCP Plan or Safer Food Better Business pack;
2. Records/logs of food safety practices undertaken (i.e. temperature monitoring, thermometer calibration, goods received, pest monitoring, cleaning schedule/cleaning instructions, process control/CCP monitoring, maintenance);
3. Log of food safety issues reported (including details of follow up and resolution if possible); customer complaints;
4. Records of food hygiene training (including date, level, duration, content and accreditation if applicable); internal hygiene and food safety training.

Observations to undertake

The following are examples of observations that can be made during the inspection:

1. Environmental prompts encouraging food safety behaviour (i.e. signage, colour coded utensils and cookware, soap and towels/dryer availability);
2. Provision and use of equipment (suitable hand wash and sinks in appropriate positions, thermometers, protective clothing/aprons/tabards, hairnet/catering hats, designated storage areas for specific items e.g. cleaning chemical storage, cleaning equipment storage);
3. Personal staff behaviours relative to food safety (nail varnish/jewellery worn, use of catering plasters, hand wash behaviour);
4. Organisation within the food handling area/workspace (i.e. logical flow for products/process, designated workspaces e.g. vegetable preparation, service, waste handling and flow, personnel ‘flow’);
5. Management/leader food safety behaviour (i.e. presence of manager/leader, role modelling positive food safety behaviours, challenges poor food safety).

5.3 Categories and sub elements

The suggested categories and elements are noted in Table 9 along with some provisional descriptive indicators.

An example colour coded scheme has also been provided. Tools such as the Hearts and Minds, Manchester Patient Safety Framework and the HSE: Leadership and Worker Engagement Toolkit use colour coding to distinguish between categories.

Table 9: Matrix of food safety culture category and elements

Category	Element							
	Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
a) **Amoral calculators:** Intentionally breach regulations for the sake of financial gain, disputing or disregarding risk to people.	Consider food hygiene to be as a nuisance. Food safety requirements are rejected for reasons of self interest.	Disregard risk of harm to people or presume it is acceptable regardless of level of non-compliance e.g. encouraging personnel to re-use food that should be categorised as waste (e.g. food dropped on the floor or returned uneaten by consumers. No action taken to evident pest infestation.	Do not care whether food hygiene requirements are effective e.g. no action when food safety issues are reported & evident e.g. fridge breakdown.	Consciously do not comply unless enforcement obliges them to. e.g. lack of presence within the business with no delegation of responsibility for food safety.	Any knowledge is not applied and no wish to improve competence. e.g. lack of interest in guidance, negative attitude to suggestions that training is undertaken (self or staff).	Management advocates non-compliance except where risk of enforcement. e.g. no attempt to provide suitable equipment /facilities to enable staff to work correctly e.g. handwash facilities.	Minimal. e.g. Dictatorial approach to 'managing' staff or simply do not seek staff opinion.	Either no trust or actively discouraged from reporting concerns. e.g. evident poor awareness of food safety among staff/evident fear of reporting – 'more than my job's worth'.

Category	Element							
	Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
b) **Dependent:** 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.	Consider food safety to be of low priority in relation to other business priorities. e.g. 'I have a business to run, VAT return to complete etc '.	Largely unaware of food hygiene risks and legislative requirements. Perceive their management of food hygiene as adequate once they have complied with most recent inspector's requirements. e.g. 'Just give me a list of what you want me to do and I will do it'.	Compliance with food hygiene requirements are the result of instruction from the regulator and other third parties. e.g. response from FBO – I have always done what the local authority have asked me to do.	Place ownership and responsibility for food hygiene compliance on the regulator and other third parties. e.g. just tell me what you want me to do…(with regard to food safety)'.	Basic competence displayed with regards to food hygiene. Knowledge is derived from interactions with the regulator and other third parties.	Leadership surrounding food hygiene is inconsistent and follows instruction from the regulator. e.g. lack of initiative and drive from the FBO. - little presence of /direction from the FBO in workplace with regard to food safety. Except following LA inspection.	Low employee engagement as development and application of practices and procedures is driven by the regulator and other third parties. e.g. staff are left to get on with what they are paid to do. Staff do what they think is appropriate.	Employees not encouraged to report poor food hygiene. Very little communication about food hygiene. e.g. staff left to get on with the job and work around any issues.

Category	Element							
	Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
c) **Doubters:** 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 purposes of regulatory compliance.	Food safety given low priority as business fails to see the benefit or importance of food safety. e.g. FBO resistant to discussions about food safety – 'we've never poisoned anyone'. Evidence of misplaced complacency. Focus on getting the job done.	Do not believe that the risk associated with their food products justifies applicable food safety practices. e.g. attitude - 'We've never had a problem'.	Doubt whether food hygiene requirements would effectively prevent food poisoning or doubt their proportionality or necessity. See HACCP as a bureaucratic burden. e.g. lack of documentation – 'Paperwork doesn't make food safe'. 'We've been doing this job for 20 years'. May have HACCP Plan 'on the shelf'/ uncustomised copy of Safer Food, Better Business.	Food hygiene requirements seen as burdensome. Businesses reject ownership of food safety practices as these are believed unnecessary. e.g. we don't need to worry - the staff know what they are doing – it's common sense.	Doubt the benefit of attending training and developing competence in food safety and do not perceive this to be relevant or important to their business. e.g. don't need to train staff – it's common sense.	Leaders fail to role model food safety behaviours and express cynicism to staff. Poor food hygiene practice remains unchallenged and feedback is not provided with regards to hygiene behaviours. e.g. FBO/Managers not adhering to protective clothing rules.	Low employee engagement as doubt the significance of the risk posed by food hygiene and the effectiveness of food hygiene regulations and requirements e.g. we've always done it this way…'	Communication about food hygiene is derogatory of the requirements. Reported concerns remain unattended e.g. 'I suppose we'd better do x /we have to do x because the Local Authority Inspector said so'. No action taken when issues are reported or actions taken are not timely/staff have to raise issues several times to get a response.

Category	Element							
	Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
d) **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".	Sets food hygiene as one of several business priorities. Accept that food hygiene is important. e.g. evident acknowledgement of compliance within the business. Receptive to suggestions from Local Authority Inspector.	Understand the food hygiene risks associated with the activities of the business and believe it important to mitigate these in line with food hygiene legislation.	Understand the benefit and importance of complying with food hygiene legislation. Confident in the use of HACCP as a means of controlling food hygiene risk within the business. e.g. easy availability of up to date HACCP Plan/customised copy of Safer Food, Better Business. Active focus on Critical Control Points within business.	Understand the importance of food hygiene compliance and take ownership of meeting the requirements. e.g. clearly understood organisational structure and defined responsibilities for food safety.	Competent & knowledgeable of food hygiene legislation and how to manage risks. Undertakes mandatory Food Standard food safety training for food businesses. e.g. staff have received instruction in food hygiene & safety and are evidently knowledgeable. Those monitoring Critical Control Points display good understanding.	Leaders role model and encourage the food hygiene behaviours desired from their staff as per the regulations. Leaders challenge poor food hygiene practices which fail to comply with legislation. e.g. FBO complies with rules for hygienic practice. FBO shows active interest in compliance and deals with breaches.	Employee engagement is accepted to help comply with regulation. Develops food hygiene practices with some staff involvement and offers the opportunity for employees to comment once complete. e.g. HACCP plan/Safer Food, Better Business review.	Communications focus on promoting food hygiene in line with regulation. Staff are encouraged to report examples of poor food hygiene practice to ensure compliance. e.g. staff indicate they can influence food safety practice within the business.

Category	Element							
	Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
e) **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.	Considers food hygiene to be a top priority, a critical business success factor & something they must be seen as excellent at. e.g. frequent reference to food safety/hygiene, enthusiasm for prevention rather than cure i.e. using sampling and testing to verify safety rather than control issues.	Believe that food poisoning or other similar incident could cause major adverse impact on the business as well as harm to many persons. e.g. evidence that business recognises the need to avoid complacency.	Believe that systems such as HACCP when properly applied are essential for sake of the business and that they do effectively control risks. e.g. active use and update of HACCP/Safer Food Better Business – food safety controls very evident within business.	Actively check and improve food hygiene in absence of third party inspection or requirements. See food hygiene as a business risk that they must be excellent at. e.g. evidence of active management of food safety and completion of records, timely reaction to issues.	Very well informed about hazards, latest methods of risk control as well as highly trained and knowledgeable management. e.g. evident awareness of current food safety issues, legislative changes with regard to food safety, knowledge of 'best practice' i.e. over and above legislative requirements.	Frequently encourage staff to apply food hygiene procedures, explain why this is necessary and applaud good practice. e.g. evident active interest in food safety; leadership through good examples. Recognition of achievement i.e. 'scores' for compliance with standards.	Actively seek employee views on how to improve food hygiene. e.g. evident active interest in continual improvement in food safety – incentives/rewards for compliance and consistent achievement of internal standards; encouragement of suggestions for improvement.	Employees feel completely free to report issues and trust management to respond positively. e.g. evident communication of food safety matters e.g. staff 'noticeboard' - display of any complaints and actions taken. Management receptive to suggestions for improvement. Involvement of staff in resolving issues and providing support in taking agreed actions.

5.4 Supporting guidance on enabling food safety culture improvement

At a high level the advice would be as follows per category. The concept in this advice is to help improve safety culture, as opposed to mapping results to enforcement options.

Table 10 provides example advice mapped to category, with the example colour coded scheme.

Table 11 provides example advice mapped to elements. As this is an initial concept advice has not be developed for all elements.

Table 10: Advice for inspectors on enabling improvements

Typology	Advice for inspectors on enabling improvement
a) **Amoral calculators:** Intentionally breach regulations for the sake of financial gain, disputing or disregarding risk to people.	Highlight cases where harm has occurred and cases where people have been prosecuted and jailed for intentional non compliance. Provide simple steps to compliance. Set a strict time schedule for re-visit and inspection. Share concerns and explain what 'good looks like'.
b) **Dependent:** 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.	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 food hygiene risks and identify suitable risk controls. Use examples to illustrate that the requirements are not complex and can be achieved. The examples should illustrate how knowledge and capability can be developed and compliance achieved in a non-complex manner. Share concerns and explain what 'good looks like'. Encourage independent thinking and where to obtain further guidance.
c) **Doubters:** 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 purposes of regulatory compliance.	Provide evidence and examples of the risks and the impacts these have had on business performance and profit. Use the examples to explain regulatory requirements and how required practices control these risks and benefit the business. Share concerns and explain what 'good looks like'.

Typology	Advice for inspectors on enabling improvement
d) **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".	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. Provide examples of "best practice" to help the business understand how they can enhance their practices beyond regulation. Also highlight the business and personal benefits adopting "best practice" can bring. Suggest ideas for further improvement e.g. seeking further engagement of staff.
e) **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.	Applaud the organisation, encourage them to display Food Hygiene Information certificate, become member of associations and seek awards for their achievements. Warn the business of complacency (using examples of where this has happened and why) and reinforce the need for continued learning and development to remain a food safety leader.

Table 11: Advice for inspectors on enabling improvements for each element

Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
Emphasise why food safety should be a top business priority. Use evidence to highlight how this can be achieved and the business benefits this brings. Help the business understand how placing targets or performance pressure (i.e. profit, speed of service etc.) can conflict with the prioritisation of food hygiene and compliance with regulation.	Use the results of HACCP to inform of the specific hazards and consequences of hygiene risks in the business. Highlight food hygiene risks at this business and explain how these can cause serious harm.	Use the results of HACCP to explain how each risk control relates to each hygiene risk and the business benefit of controlling this risk. Make clear the severity and likelihood of risk to food hygiene without the use of management systems and impress importance of their use.	Emphasise individual and business responsibilities for food safety and hygiene. Provide examples of how the business can encourage staff to take ownership of food hygiene and benefits this brings.	Talk through the competence requirements for the business to effectively manage risk as detailed in the HACCP and relevant legislation. Provide advice and examples of how food safety and hygiene competence can be developed, knowledge shared within the business and the benefits this can bring.	Use the results of HACCP, observations and documentation to highlight the food safety and hygiene practice leaders and managers (if applicable) can demonstrate to encourage positive food safety practices and challenge poor food hygiene practices. Use examples to demonstrate the benefit of doing this.	Emphasise the business benefit of employee engagement Provide examples of how engagement can be improved in a simple and effective manner. For example: Asking staff for input when reviewing/ developing food safety practices. Encouraging staff to offer feedback and ask questions surrounding changes to food safety practices.	Emphasise the business benefit of communication and trust Provide examples of how communication and trust can be enhanced in a simple and effective manner. For example: Encouraging and praising staff who report hygiene issues. Leaders making themselves approachable and available for staff to report issues.

6 WORKSHOP REVIEW AND REVISIONS TO INITIAL CONCEPT

6.1 Overview

Two workshops were completed as an initial qualitative review of the toolkit. The workshops were held with:

- 20 Environmental Health Officers (EHOs), and
- 15 Food Business Operators.

The EHOs were food hygiene specialists mostly from London and the surrounding counties, with two representatives from Wales.

The 15 FBOs represented micro, medium and large food businesses covering retail, restaurants and catering. Delegates from smaller businesses comprised managers and directors. Delegates from larger businesses comprised food safety specialists.

The feedback from each workshop is summarised in section 11 of this report and summarised below.

A topic guide was used at each workshop, as per section 12.

The Agency acted as observers at the workshops.

6.2 Key findings from the EHO and FBO workshops

The key findings included:

- The titles of the elements and categories needed to be amended to be clearer and to match delegates' views of business attitudes;
- The applicability of the tool to micro businesses was, in some respects, challenged;
- The use of the tool by inspectors needs to be clarified, especially with reference to enforcement decisions and inspection ratings;
- Whilst inspectors felt they already assessed safety culture, if informally, FBO's doubted the ability of inspectors to assess safety culture without additional training;
- Additional guidance on how to improve safety culture would be welcomed.

There were also comments on detailed aspects of wording and presentation of the categories and elements.

Ratings

Delegates were asked to rate each element and category, with respect to five points, such as level of detail. These ratings were presented to delegates during workshops to prompt discussion.

Figure 2 shows the ratings of the element by Environmental Health Officers. The ratings across elements were reasonably consistent. It can be noted that:

- 48% of ratings were good or excellent, 39% average and 13% poor or very poor;
- Level of detail and comprehension were rated as average to good by most EHOs;
- There was very mixed ratings for cultural appropriateness, from very poor to excellent;
- There were also mixed ratings of applicability and user friendliness.

Figure 3 shows the EHOs' average frequency of ratings of the categories. It was also noted that the ratings were better as you move from Amoral Calculators through doubting and dependent compliers to proactive compliers and leaders. Thus, EHO's rated the

"better" categories of business higher than the "poorer" categories of businesses. Overall, it can be noted that EHOs:

- Overall, 47% of ratings were good or excellent, 35% average and 18% poor or very poor;
- Comprehension and user friendliness had the lowest ratings;
- Applicability and cultural appropriateness tended to be rated higher;
- Level of detail had mixed ratings.

Figure 4 shows the FBOs' ratings of the elements. The ratings were reasonably consistent for each element. It may be noted that:

- 49% of ratings were good or excellent, 38% average and 13% poor or very poor;
- There was mixed ratings on all questions, especially user friendliness.

The FBO's ratings of categories are shown in Figure 5 and Figure 6. Figure 5 shows the ratings across all 5 categories and Figure 6 shows the average ratings across the questions for each element. It may be noted that:

- 57% of ratings were good or excellent, 27% average and 16% poor or very poor;
- There were mixed ratings for all of the questions;
- Comprehension tended to have lower ratings;
- As with EHOs, FBOs rated the "better" categories higher than the "poorer" categories. For example the "leaders" category was rated good or excellent more often than the 'amoral calculators' category.

Whilst delegates were more likely to rate elements and categories as good or excellent, than poor or very poor, the ratings indicated a need to amend the toolkit.

Figure 2: Environmental Health Officer ratings of the elements (N = 18)

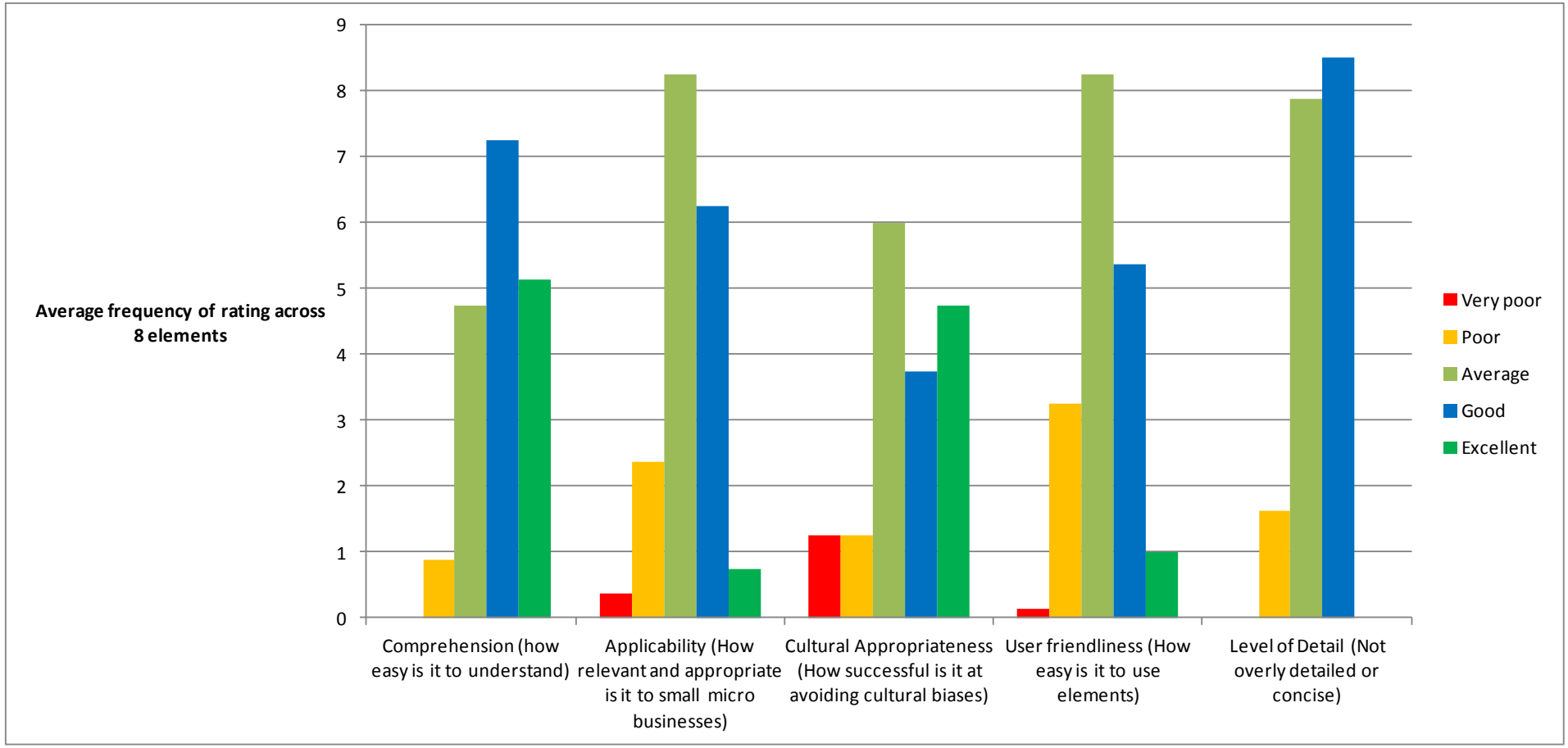


Figure 3: Environmental Health Officer ratings of the categories (N = 18)

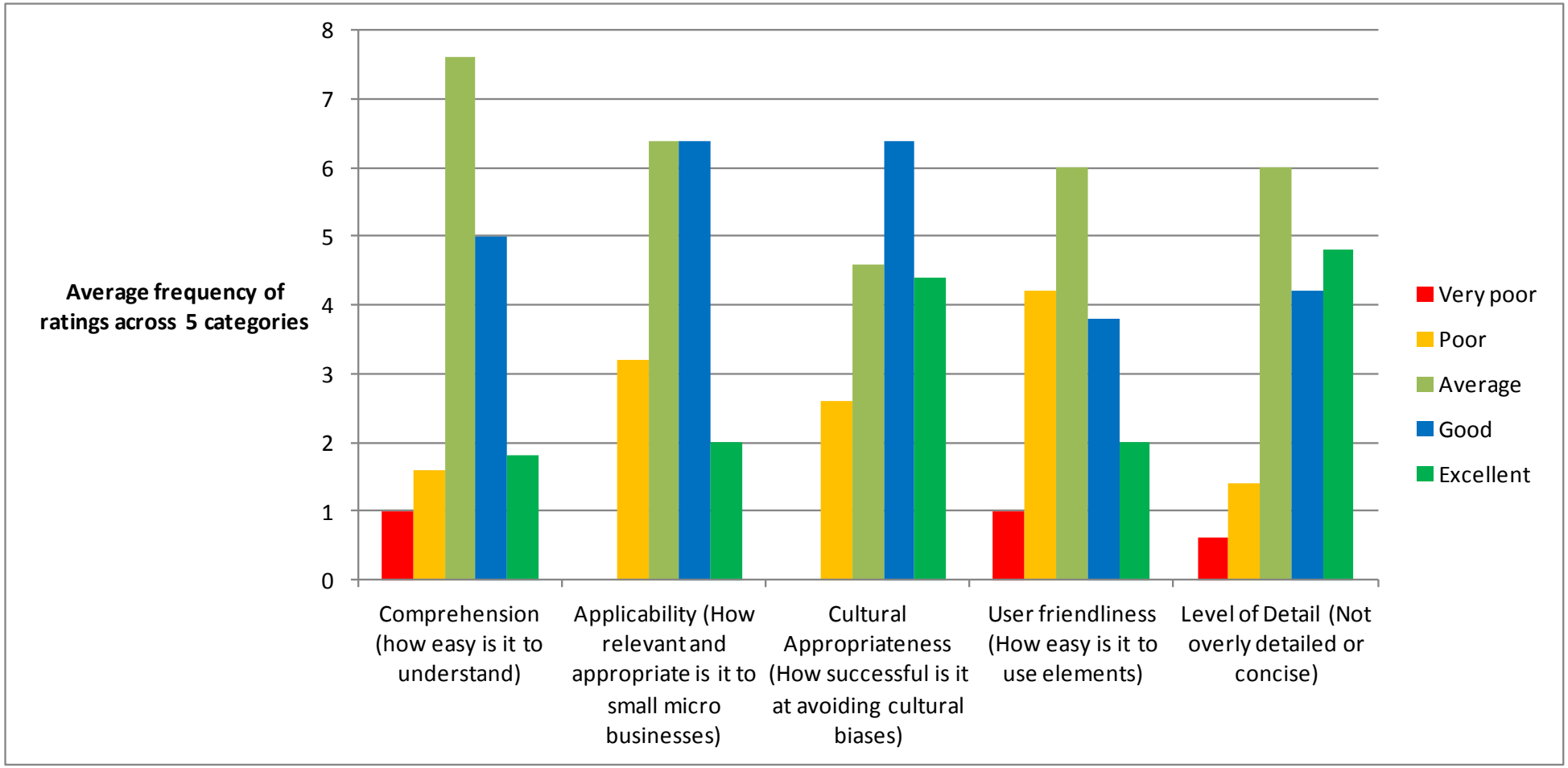


Figure 4: Food business operators' ratings of the elements (n = 11)

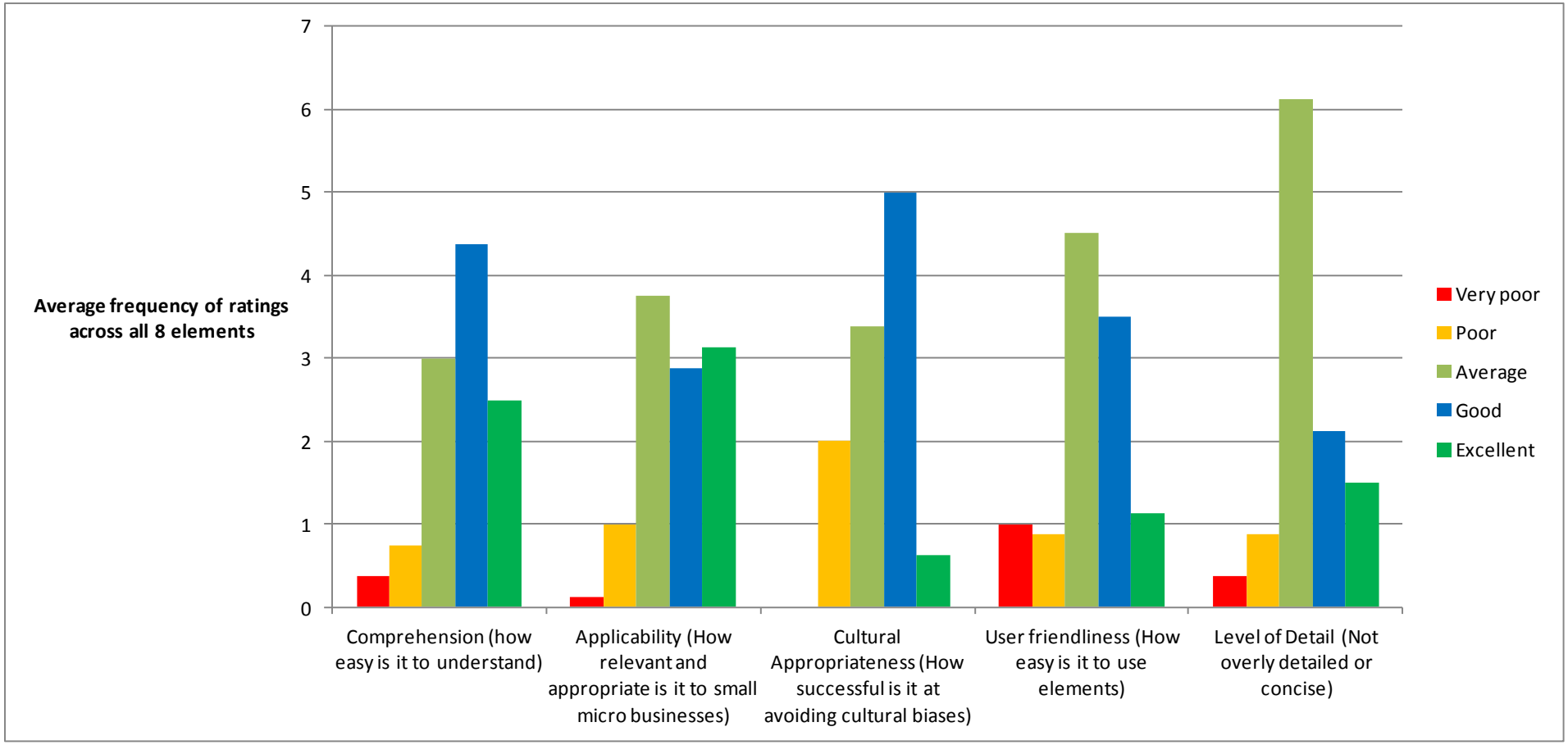


Figure 5: Food business operators' ratings of the categories (n = 11)

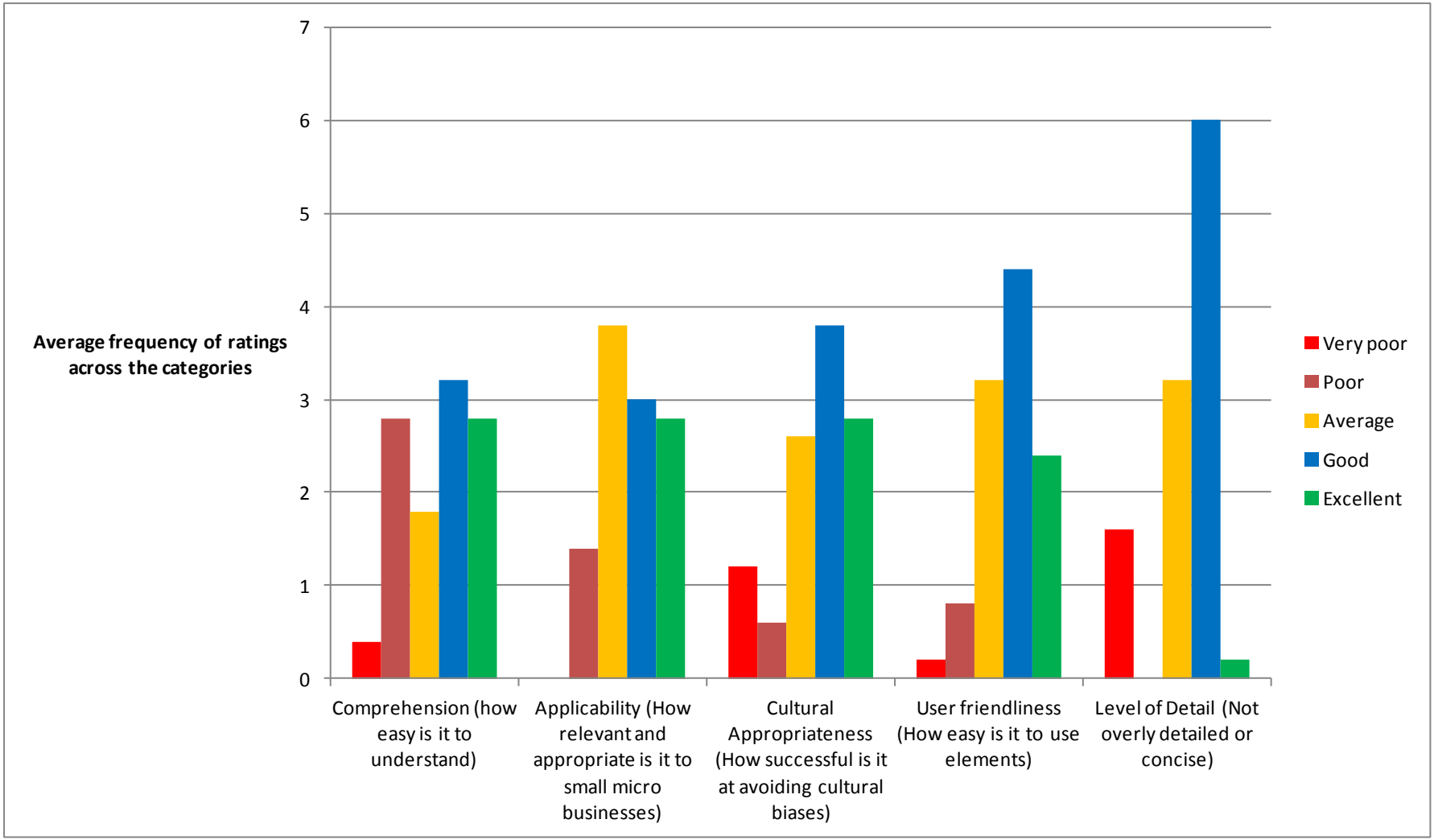
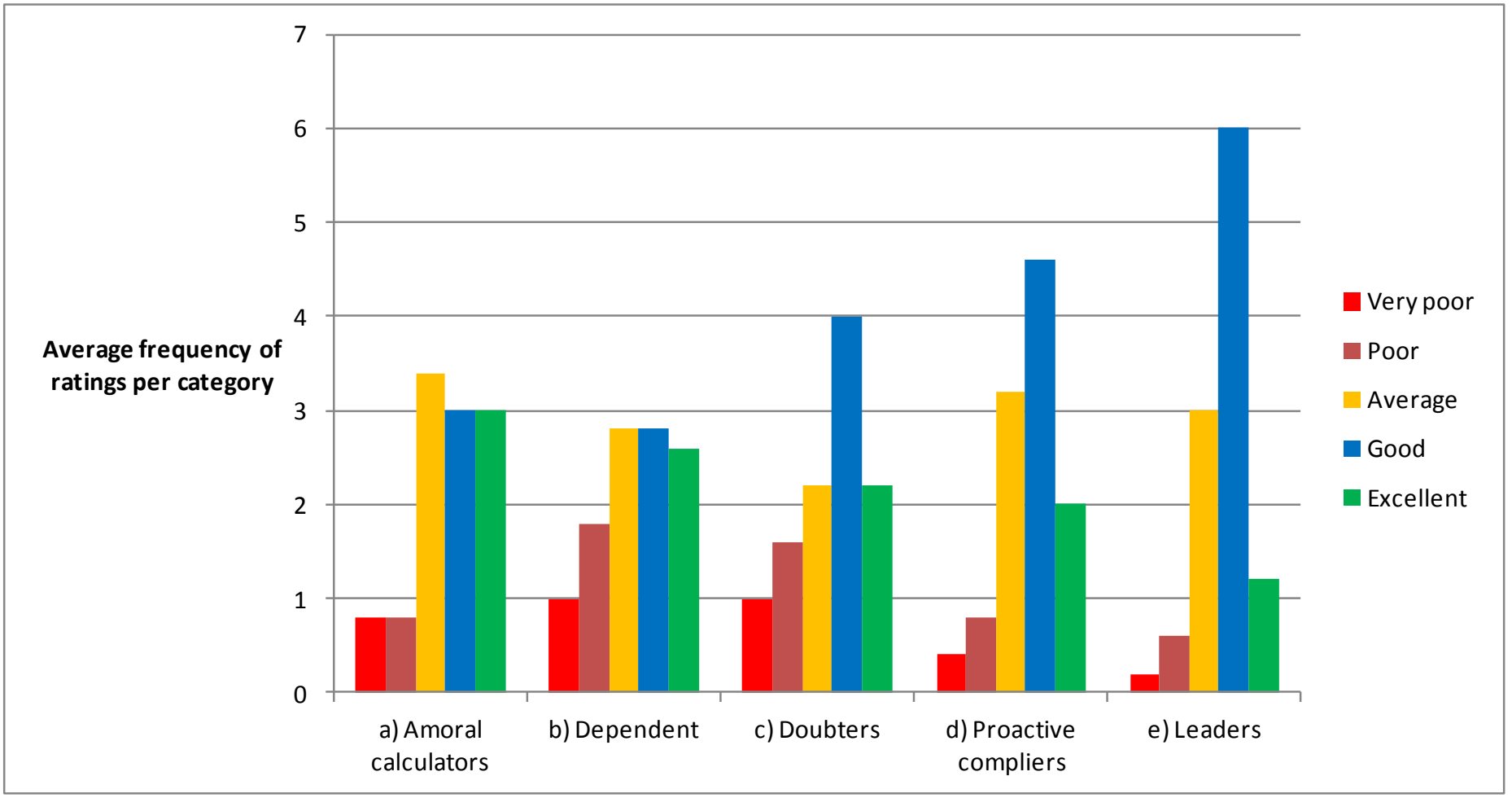


Figure 6: Food business operators' ratings of each category (n = 11)



6.3 Key amendments

The feedback from delegates was reviewed and discussed with the Food Standards Agency.

The main amendments included:

- Providing an outline of how the tool may, at the inspector's discretion, be used to inform confidence in management ratings and enforcement decisions;
- Changing the title of 'amoral non compliers' to 'calculative non compliers';
- Switching around the categories doubting compliers and dependent compliers;
- Amending the definition of proactive compliers to allow for expression of legitimate challenges to food hygiene requirements and valid discussions about how best to comply;
- Amending the definition of doubting complier to highlight that the doubts are not based on informed views but are based on uninformed assumptions;
- Amending the titles of elements to ensure it is clear they refer to the attitudes of the business;
- Presenting definitions of elements per category on one landscape page so they can be read across in one viewing;
- Providing guidance on how to improve safety culture for each combination of category and element;
- Re-wording questions to form issues to be considered.

A full version of the toolkit was developed (with a background section) to act as a training aid and reference, along with a two sided version for use in inspections.

No elements were deleted. The researchers and the Agency considered, based on previous research that all elements applied to all sizes of businesses (with the exception of sole traders).

The amended full version of the toolkit is shown in a separate report.

The revised categories and short version of guidance on improving safety culture are shown in Table 12 and Table 13.

Table 12: Amended food safety culture categories

a) **Calculative non-compliers :** Intentionally breach regulations for the sake of financial gain, disputing or disregarding the potential impact on consumers – without assessing the potential impact on people and making decisions without due deliberation or consideration of regulations or other requirements; e.g: 'I never bother wasting time on something that will cost me time but not make me money'
b) **Doubting compliers:** Doubt the significance of the hazard posed by food safety and hygiene and the effectiveness of food hygiene regulations and requirements in managing these hazards. 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 purposes of regulatory compliance. e.g: 'We've never had a problem in all the time we have been trading'
c) **Dependent compliers:** Wait upon advice or instruction from regulators and other third parties to make improvements and view food safety and hygiene as something driven by third parties. Tend to view requirements as unfairly complex and that it is 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 potential issues posed by food safety and hygiene. e.g: 'Just give me a list of what you want me to do and I will do it'.
d) **Proactive compliers:** Understand that hazards posed by poor food hygiene and poor process controls are significant and accept that requirements are effective and necessary. Wish to ensure food safety controls are proportionate and effective, and will positively debate (internally and externally) how best to manage food safety hazards in a cost effective and proportionate way, implementing food safety controls after careful deliberation. Management provides a lead in encouraging compliance for the sake of the business as well as regulatory compliance but may not go beyond "good practice". e.g: 'We encourage all staff to take ownership and responsibility for food safety and we challenge non-compliance'.
e) **Leaders:** View food safety and hygiene as critical business issues 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 reviewing food safety and improving food hygiene. **e.**g: 'We pride ourselves on the safety and hygiene practices of our business'

Table 13: Amended advice for inspectors on enabling improvements

Category	Advice for inspectors on enabling improvement
a) **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. Say that they will be inspected more frequently until there is confidence in their willingness and ability to apply good practice and they are likely to be subject to more severe enforcement if incidents occur because of their attitudes.
b) **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. Use the examples to explain how the regulatory requirements help to control these hazards and risks and explain the benefit to the business (by maintaining customer confidence). Highlight how the behaviour of the business manager(s) sets an example for the rest of the staff and that they need to set a good example and provide positive leadership to encourage their staff to comply with the law (and thereby avoid damaging the business). Sympathise with their concerns and then explain what 'good looks like'.
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. The examples should illustrate how knowledge and capability can be developed and compliance achieved in a non-complex manner. Sympathise with their concerns and explain what 'good looks like'. Encourage independent thinking and explain where to obtain further guidance. Highlight that they cannot rely on inspectors (who will not always be there) and how it is their duty to take a lead in developing controls for significant hazards within their business.

Category	Advice for inspectors on enabling improvement
d) **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. Provide examples of “best practice” to help the business understand how they can enhance their practices”. Also highlight the business and personal benefits adopting “best practice” can bring. Suggest ideas for further improvement e.g. seeking further involvement of staff, consideration of alternative methods for monitoring e.g. the use of temperature data loggers for chilled storage temperature monitoring
e) **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 and seek awards for their achievements e.g. third party certification to an appropriate standard. Warn the business of complacency (using examples of where even the “best” businesses have had problems and why) and reinforce the need for continued learning and development to remain a food safety leader. Ask about future plans and applaud examples of planned actions by the business.

7 FUTURE PILOTING OF THE FOOD SAFETY CULTURE TOOL

7.1 Introduction

This project used previous research to produce an initial version of a food safety culture diagnostic toolkit. Whilst previous research, mostly in the fields of occupational health and safety and patient safety, provide a basis for a food safety culture toolkit, there could be value in a quantitative assessment of the toolkit.

Larger scale piloting of assessment methods can achieve the following key objectives:

- Usability - Further assessing the usability of the tool from the perspective of the inspector and the FBO, within a “live” inspection;
- Reliability (internal) - analysing the results of the assessment, across different inspectors, using split half analysis to measure the internal consistency of the question set;
- Reliability (external) – analysing the results of the assessment, across different inspectors and different time periods to test consistency of scores over time and between assessors;
- Construct validity. Analysing the results of the assessment to assess extent to which the categories and elements measure what they purport to measure;
- Predictive validity. Analysing the results of the assessment to determine the extent to which scores from the tool “predict” scores on other food safety measures, such as confidence in management scores and frequency of formal enforcement.

7.2 Example structure of a pilot

Typically a larger scale pilot would involve four stages:

7.2.1 Stage 1: Application of the toolkit by inspectors

This stage would involve, inspectors, with potential support from researchers applying the tool to a sample of businesses. As detailed in section 7.3.1 the sample should be designed to include a wide spectrum of businesses, from micro to large, across sectors and representing all standards of performance.

This first stage of the pilot would investigate a number of issues.

Usability of the tool (section 7.3.4) would be tested, with feedback gathered from inspectors. This can be done either through face to face interviews or a workshop. Researchers can also observe inspectors applying the tool, to help understand usability issues.

This usability testing will also help identify relevant training needs for the inspectors. This will help to enhance usability and application (section 7.3.4).

The results of the inspections can be used to test the reliability (section 7.3.2) and validity (section 7.3.3) of the toolkit. For reliability the all inspection scores can be analysed using statistical tests to understand if the toolkit is completed consistently by all inspectors.

For validity, the results from the application of the toolkit would be analysed to understand if the current structure of the categories and elements is appropriate.

Moreover, the application of the toolkit will be part of an overall inspection and thus performance information such as confidence in management scores and frequency of enforcement will be obtained.

The results of the food safety culture toolkit can be correlated with these performance scores to understand if there is a relationship and if food safety culture scores can predict

performance on other food safety measures.

7.2.2 Stage 2: Amendments

The second stage of the pilot would involve making amendments to the toolkit. These could cover:

- Addressing usability issues and providing relevant training;
- Adjusting the structure of categories and elements to enhance validity;
- Adjusting descriptors, instructions and guidance to enhance consistency of application.

7.2.3 Stage 3: Re-testing

The third stage of the pilot would involve the inspectors re-applying the toolkit to the same sample of businesses. This should occur approximately three months after the first application of the toolkit. The inspectors would re-apply the tool with the support of researchers.

This stage of the pilot would investigate a number of issues.

Firstly, if any usability issues identified in stage 1 had been addressed and the training provided helped improve any identified usability issues.

Secondly, the results of the re-testing would be analysed to understand if any identified reliability issues from stage 1, in terms of consistency in application had been addressed. If no consistency issues had been identified in stage 1, this analysis would help confirm if the tools level of consistency in application remains stable over time.

Thirdly, food safety culture scores from stage 1 would be compared to the scores obtained from stage 2 to determine if scores from the tool remain stable over a short period of time, thus demonstrating reliability (section 7.3.2). Stage 1 and 2 scores would also be compared to see if the structure of the categories and elements remains stable over time (section 7.3.3).

Fourthly, the results of the re-testing would be analysed to understand if food safety culture scores can predict performance on other food safety measures such as confidence in management scores and frequency of enforcement (these would be obtained as part of the stage 2 inspections).

This would help determine if the predictive validity (section 7.3.3) of the tool is stable over time. Moreover, this analysis would help to determine if improvements in food safety culture can lead to improvements in other performance measures.

7.2.4 Stage 4: Final amendments

- The final stage of the pilot would involve making any final amendments to the toolkit to address issues relating to: Usability;
- Reliability; and
- Validity.

The following section details key principles that should be adopted to ensure piloting of the tool achieves key objectives.

7.3 Piloting principles

7.3.1 Principle 1: Sample

The sample size (business and inspectors) for pilot need to be large enough to ensure statistical analysis of results can be carried out and statistically robust results obtained, (where relevant).

The sample would also need to demonstrate diversity in selection. This would help to achieve an acceptable level of generalisation i.e. the results of the pilot can be generalised to the study population.

To achieve diversity a sample can be stratified to ensure representation across:

- **Business size** – for example single owners, micro, small, medium and large businesses;
- **Ownership** – for example family owned, private owned, local government funded;
- **Sector** – for example restaurants, shops, supermarkets, takeaways, canteens, food stall, production vs distribution;
- **Ethnicity** – for example, BME, Asian, etc;
- **Location** – for example, large cities, smaller towns etc;
- **Age of the business** – for example new start ups vs longer ownership;
- **Performance** - such as those with good and poor inspection ratings.

7.3.2 Principle 2: Reliability

Assessing the reliability of the tool would help to determine the extent to which:

- Inspectors complete the tool in a consistent manner (internal consistency and inter-rater reliability);
- The assessment score remains stable over (test-re-test).

Internal consistency can be achieved through analysing the scores of all inspections, using a split half reliability method. This would provide a statistical analysis of the internal consistency of the tool.

Test-retest requires the assessment to be completed at another point in time with the same business and the same inspector. Given that culture can change over time, the time period between assessments should not be more than three months.

The assessment scores for each time period can be correlated to determine level of stability.

It is also possible to test inter-rater reliability within a pilot. This analysis builds on internal consistency and helps to determine if different investigators provide the same assessment score, if they assess the same business.

For this to be achieved inspectors need to be randomly assigned into pairs. Both inspectors would carry out the assessment (without conveying results) and then the results across the pairs would be correlated to assess similarity in scores.

7.3.3 Principle 3: Validity

Assessing the validity of the tool would help to determine the extent to which the tool:

- Measures what it claims to measure (food safety culture categories and elements). This is known as construct validity;
- Predicts performance on other food safety measures. This is known as predictive validity.

Construct validity can be completed using the assessment results of the pilot and using an analysis technique called factor analysis. This provides a statistical factor structure for the tool, which can then be compared to the current structure of the tool (categories and elements).

Predictive validity helps to build a solid evidence base demonstrating the effectiveness of the tool.

Predictive validity is assessed by correlating and then regressing the assessment scores with other measures of performance to determine the extent to which the food safety culture assessment score "relate" with and "predict" other performance measures.

To ensure predictive validity can be assessed as part of the pilot, dependent variables will need to be selected and obtained. Example dependent variables, that could be obtained from each business inspected, include the confidence in management scores, and frequency of formal enforcement.

Given the low rate of prosecution and other forms of formal enforcement, it may be necessary to group businesses by their food safety culture result and then compare the frequency of enforcement or confidence in management scores for groups of business with different food safety culture results.

7.3.4 Principle 4: Usability and training needs

An important part of piloting is to understand the usability of the tool and the training needs of the users.

It is important, however, to determine the difference between the two. That is, what are issues that are being caused by the design and instruction of the tool and what are the issues relating to the inspectors' competence and understanding of culture and the tool?

Moreover, it is important to determine what issues can be addressed through re-design of the tool and what issues can be addressed through training? For example, some usability issues can be more effectively tackled through training, than re-design.

Assessing usability and training needs can be achieved through members of the research team shadowing inspectors during their inspections, using the food safety culture tool. The individual shadowing the inspector can use a structured proforma to gather data on the usability of the tool, from both the inspector and the FBO.

Observations of usability often cover the following areas:

- **Suitability** – how is the tool applied during an inspection, is it suitable for application during an inspection and do inspectors and FBO's understand how it should be applied?
- **Accuracy** – Is the tool accurate in its descriptions and information provided. Do FBOs agree with the assessment? Do inspectors and/or FBOs misinterpret information within the tool?
- **Accessibility** – Is the tool understood by both EHO and FBO during the inspection, in terms of terminology, concept and advice provided?
- **Navigation** – Can the EHO successfully navigate through the tool within an

inspection and can the FBO follow the results and the outcome?

- **Compatibility** – can the tool and the assessment results be linked with other parts of the inspection to help support inspectors' judgements and advice provided to the FBO.

The results of a shadowing exercise can be analysed to help determine which issues (within the above categorises) can be addressed through re-design and which can be addressed through training.

8 CONCLUSION

The issue of food safety culture has been given greater attention recently due to increased interest in the role of business attitudes in achieving compliance and avoiding food poisoning. This mirrors the sequential progression from engineering and procedural solutions to safety, towards managerial and more recently cultural solutions to safety performance seen in the occupational health and safety culture and patient safety. The previous research in the fields of occupational health and safety culture and patient safety culture along with the more limited research into food safety culture provided a basis on which to develop an initial version of a food safety culture assessment toolkit. Initial qualitative review of the toolkit with EHOs and FBOs enabled the toolkit to be further developed. Future work could usefully include a quantitative scale of piloting to further test its usability and to assess its reliability and validity.

9 APPENDIX A: DATABASE SEARCH

Table 14: summary of database search depth and output

Database	Search terms and format used	Exclusions applied (if any)	Extent of search	Relevant output generated
OSHLINE, HSELINE, NIOSHTIC, CISILO (English), NIOSHTIC-2, Canadiana	(Safety <OR> occupational health <OR> food <OR> process safety) <IN> Abstract Text <AND> (Culture <OR> climate <OR> norms) <IN> Abstract Text <AND> (Research <OR> tool <OR> method <OR> assessment <OR> measure <OR> indicator <OR> validation <OR> evaluation <OR> diagnose*) <IN> Abstract Text	1990-current.	691 results retrieved. 120 searched.	30 relevant results retrieved.
Science Direct	((Safety OR "occupational health" OR food OR "process safety") AND Culture OR climate OR norms) AND Research OR tool OR method OR assessment OR measure OR indicator OR validation OR evaluation OR diagnosis or diagnostic	1990-current. Searched Abstract, title and keywords.	3,407 results retrieved. 200 entries searched.	52 relevant results retrieved.
IOSH (OSH Research Database)	No search terms used. All research projects reviewed for relevance.	N/A	All research projects reviewed by title and summary information. (13 pages, approximately 15 per page).	1 relevant result retrieved.

Database	Search terms and format used	Exclusions applied (if any)	Extent of search	Relevant output generated
UK Health and Safety Executive	safety, occupational health, culture, climate, norms, research, tool, assessment	searching for 'research'.	2,780 results retrieved 100 searched.	9 relevant results retrieved.
Google Scholar	((Safety OR "occupational health" OR food OR "process safety") AND Culture OR climate OR norms) AND Research OR tool OR method OR assessment OR measure OR indicator OR validation OR evaluation OR diagnose*	excluding patents.	460,000 results retrieved. 100 searched.	3 relevant results retrieved.
Google Scholar	(Safety AND Culture) AND Research OR tool OR method OR assessment OR measure OR indicator OR validation OR evaluation OR diagnose*	excluding patents.	718,000 results retrieved 50 searched.	4 relevant results retrieved.
Google Scholar	(Safety AND Climate) AND Research OR tool OR method OR assessment OR measure OR indicator OR validation OR evaluation OR diagnose*	excluding patents.	1,190,000 results retrieved. 100 searched.	20 relevant results retrieved.
Google Scholar	(Safety AND norms) AND Research OR tool OR method OR assessment OR measure OR indicator OR validation OR evaluation OR diagnose*	excluding patents.	460,000 results retrieved. 50 searched.	1 relevant result retrieved.

Database	Search terms and format used	Exclusions applied (if any)	Extent of search	Relevant output generated
National Patient Safety Agency	safety culture	Searched within human factors patient safety culture.	7 retrieved, all searched.	1 relevant result retrieved.
Researcher's prior knowledge	N/A	N/A	N/A	48 relevant results retrieved.

10 APPENDIX B: BIOGRAPHY

The following are references of resources retrieved through the literature search as described in section 3.1. The references described in the footnotes (within this report) are those relating to the shortlisted tools only.

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11 APPENDIX C: WORKSHOP SUMMARIES

11.1 Environmental Health Officer Workshop

11.1.1 Validity of the categories and elements

Distinction between categories

Delegates queried the positioning of the categories as follows:

- That Dependent compliers are “better” than Doubting compliers, so the order of these two categories should be switched around;
- Some dependent businesses do not view regulations as complex;
- That “good” businesses can express doubts about safety requirements. This does not detract from their good performance. Educated businesses may validly challenge requirements and pose questions;
- The term “amoral” was disliked as it appeared contentious.

Distinction between elements

It was suggested by some delegates that the elements “Business ownership...” and “Leadership...” were similar, as were “...risk perception...”, “...training...”, “Priorities...” and “Leadership...” It was suggested that the elements could be consolidated.

Applicability to micro businesses

Delegates queried whether some of the elements applied to micro businesses, including:

- Leadership, as there may be just one “boss”;
- Communications and employee engagement – as the FBO may “simply” talk to staff;
- Leadership and communications would not apply to sole trader businesses;
- Micro businesses are unlikely to have a staff review process.

It was also queried who you ask the questions of, such as staff or the FBO?

It was suggested that some elements be applied to all businesses but that some are only applied to larger businesses (Communications, ...engagement and Leadership).

Cultural suitability

Whilst there were few queries about the cultural applicability of the tool, it was suggested that:

- Some cultures may not place such high importance on improvement in performance;
- Employee engagement is a “Nordic” concept.

However, it was also noted that it is not possible to generalise between cultures.

A greater issue was that there may be language challenges in applying the tool.

Questions for assessing businesses

There was some concern that businesses may offer “socially desirable” responses to the questions in the toolkit. There was also a general suggestion to avoid having too many questions in the toolkit, if any, to avoid provision of excessive guidance to inspectors.

Other points

It was suggested that an inspector would need to have made at least one visit and possibly more to be able to apply the tool to a business.

11.1.2 Presentational suggestions

It was suggested that:

- Guidance for assessing each element should be presented on a single page, with each category as columns;
- The tables showing the categories and category level advice be merged into a two sided document;
- Some of the element headings need to be clarified, such as that it is the *business's* attitudes towards food hygiene, and the *business's* confidence in food hygiene management requirements.

11.1.3 Use of the tool

There was an extensive discussion about the purpose and use of the tool, particularly about how the tool fits with enforcement decisions and inspection ratings. Some points included:

- Is it a "back office" tool for use in assessing inspection ratings, as opposed to being applied on site?
- Could it be used as a management tool to guide the use of inspector resources?
- Could the tool be used for case review, such as with persistent offenders?
- The tool should be linked to the food law code of practice and guidance on enforcement decisions;
- The tool should link to confidence in management ratings (annex 5 of the code of practice), especially the attitude aspect;
- The tool could assist with justification of enforcement decisions in court;
- Should you record premises' ratings on file?
- Could the tool be a training aid for inspectors? This suggestion followed on from the view that experienced inspectors already carry out this type of assessment, if informally. This option would require more detailed examples.

It was also noted that other factors influence how you might try to change a business' attitude, such as the type of business.

It should be noted that opinion was mixed regarding the use of the tool, especially with regard to linking it to the food law code of practice. Whilst some delegates suggested a link to the code of practice should be made, others disagreed. Some delegates suggested you can review business history to understand its attitudes, reducing the need for the tool and for linking it to the code of practice. It was also noted that the toolkit is longer than Annex 5.

Some delegates also focused on how the tool might help change business culture rather than its use in enforcement. This led to the suggestion that the tool offer more advice on how to change business culture.

It was also suggested that businesses could self assess using the tool.

There was also a discussion regarding whether inspectors can realistically influence business culture, although it was noted that enforcement organisations may also use non-regulatory methods to influence business culture, such as advice.

11.1.4 Suggested improvements

It was suggested that:

- The Dependent and Doubting categories be switched around and detailed explanation of each element be presented for all 5 categories on one page;
- The tables showing the categories and category level advice be merged into a two sided document;
- Advice on how to improve safety culture be category specific;
- More advice be provided on how to improve safety culture, with hyperlinks to other guidance;
- More phrases should be provided illustrating each element/category;
- Some wording should be changed to ensure it is applicable to micro firms;
- That merger of some categories be considered;
- That dropping some elements for sole traders and/or micro businesses be considered;
- That the role of the tool in enforcement and inspection be clarified.

11.2 Food Business Operator Workshop

11.2.1 Use of the tool

FBOs were not clear on how the tool should be used.

For example:

- One delegate from a large retailer was hesitant/wary of the tool being used if it was linked with 'Scores on the Doors' as he felt that the language used could be mis-interpreted. He believed that it would be better used as a standalone tool;
- One Primary Authority (PA) organisation represented would be reluctant to use the current tool as they want to see where they fit within the Primary Authority scheme first;
- Several delegates felt the tool would be better as a self assessment tool for businesses.

Options that emerged from discussions were:

- Feeding into confidence in management ratings;
- Helping support enforcement decisions;
- Self assessment by FBOs.

The FBOs were not fully convinced that the EHO would be able to make an accurate cultural assessment without training. Indeed FBOs felt that EHOs may lack knowledge relating to specific food practices (for example the making of certain cheese), which could in turn influence the way in which they categorise culture. Also this lack of knowledge could impact on their understanding of risk, which again would influence their categorisation.

Several delegates commented that there are differences on how EHOs currently regulate, and if they were using this tool it would still be down to the individual interpretation of the EHO, which can lead to inconsistency.

The tool was very positively received as a potential self-assessment tool for FBOs, although

it was noted that this may only be used by the high performing organisations.

FBOs also raised the issue of how the tool would be used for larger businesses. In that to fully understand the culture, a more detailed assessment would be required, that considers the differences between departments. It was questioned whether the EHO would have the time and the ability to do this. Indeed the question was posed, 'Would a store manager actually need to be a 'Leader' or just the Head Office?

It was also raised by the larger FBOs as to how the tool would be used to asses both the FBO and the supply chain and the value this would bring, given that suppliers of large businesses have to work to a strict food safety management system.

11.2.2 Overall perceptions of the tool

View from the FBOs was positive. Generally it was liked because:

- Useful to use internally;
- Can be used for discussion if you have differences with EHO;
- Can be a bargaining tool within a business for different sorts of training;
- Some believed it to be useful for the business and the EHO, others disagreed and thought that it would not be useful for the EHOs as they are individuals so would interpret it differently;
- Another delegate thought that it would address behaviour well because it would encourage dialogue between the business and the EHO;
- Good checklist/tool for an EHO when assessing a new business;
- Useful internal tool to help empower staff and encourage involvement in food safety.

A number of concerns were also raised regarding the use of the tool:

- One delegate from a micro business was unsure that it would be effective. He believed food standards have improved over the years but the culture has not;
- The tool would be less effective as it will be based on opinions of the EHOs;
- Tool could be used by EHOs to marginalise/stereotype business to 'damn' them instead of using it to encourage improvement.

Two retailers within the workshop were concerned to how the tool would help them (rest of the FBOs felt it would help them).

They felt that it may be best for them as a self assessment tool – for example 20 or so store managers in a room and present it to them and ask them to use it as an assessment tool.

11.2.3 Categories

Overall FBOs felt that a cultural model was useful and that there were around 5 different levels of culture. Moreover FBOs did agree that the cultural levels may not be sequential.

FBOs highlighted that businesses can have various scores depending on elements and FBOs could see own business across the different elements.

A number of issues were also raised with regard to the elements such as:

- There is a fine line between Dependents and Doubters. But one delegate disagreed, he thought that it should be separate as descriptors are 'black & white';
- It was felt there are a number of different types of "dependent" – those that are willing and those that are unwilling;

- It was felt that there may not be a need for an 'Amoral Calculator' category, as it was considered a pre-requisite that a business is above this. Although it was suggested that this view is probably more a function of the organisations attending the workshop;
- Terminology could be provocative/inflammatory – if tool was used by business as a self assessment tool would they really class themselves with a negative category? It was also felt that the categories were slightly negative in their description.

11.2.4 Elements

FBOs were generally positive regarding the elements and felt that all 8 elements were relevant.

It was highlighted that the descriptions of the elements could be enhanced as "They seem quite vague".

It was also felt that a few elements could be combined, for example:

- One delegate believed that 'Competence, learning, training etc.' incorporates too many different items and would be better if these were separate;
- Is perception needed in 'Food hygiene risk perceptions & knowledge'? Instead just use 'knowledge' as it is difficult to 'perceive' food safety.

11.2.5 Further developments

The following developments were proposed:

- Refinement of the categorises and elements;
- Determine use of tool – considered not to be a standalone tool but something that could be integrated; and how the assessment feeds into EHO decision making. For example: If EHOs start to use it, will they know how to proceed if they class business as an 'Amoral Calculator'? i.e. should they enforce?
- GSB should take tool to a business and accompany an EHO to see how it works;
- One delegate asked if it could be sent to Managing Directors as culture filters down, but another delegate disagreed and felt that it should start from the bottom to advise Managing Directors what the business needs to be doing else it will become a 'tick box' culture.

12 APPENDIX D: WORKSHOP TOPIC GUIDES

12.1 Environmental Health Officers

A TOOL TO DIAGNOSE FOOD SAFETY CULTURE IN FOOD BUSINESS

ENVIRONMENTAL HEALTH OFFICER - TOPIC GUIDE

Introduction

Thank you very much for attending this workshop today run by Greenstreet Berman Ltd on behalf of the Food Standards Agency (FSA).

Introduce facilitators and observers

I am Michael Wright and I am the lead facilitator for today. My colleague Paul Leach is the second facilitator who will scribe the main sessions and facilitate one of the sub-groups. We have an FSA observer here today, however they will not be contributing to discussions or facilitation of the workshop.

Housekeeping

Before we start today, I will just run through some basic housekeeping information:

- Location of toilets and fire escapes;
- Request that mobile phones be switched onto silent and any business critical calls be taken outside of the room to minimise disruption;
- Anonymity of information gathered;
- We will be recording the event and making notes as we move through the different sessions to ensure the accuracy of the write up; and
- There are no right or wrong answers, we value everyone's feedback and opinions and would ask that you show respect to your fellow attendees by speaking one at a time.

Background to the work

The Food Standards Agency has commissioned Greenstreet Berman Ltd to help develop a food safety culture diagnostic toolkit for use primarily by local authority food hygiene inspectors to assess food safety culture. This work is prompted in part by an outbreak of E. coli O157 in South Wales in 2005 and the publication of the Public Inquiry Report in March 2009 which brought renewed attention to the issue of cultures and behaviours in businesses and enforcement bodies and compliance with food hygiene legislation.

As part of this work, Greenstreet Berman Ltd have developed a Food Safety Culture Diagnostic Toolkit for use by local authority food hygiene inspectors to identify aspects of good/poor food safety cultures in food businesses. The toolkit has been developed with particular consideration for use with micro and SME businesses in mind, however the tool is not intended to have exclusive application for such businesses. Underpinned by a review of food safety culture literature and existing toolkits and question sets from other industries, (including health and safety, process safety and the rail industry), we are now seeking your feedback to further develop the toolkit as it stands in its draft form.

Greenstreet Berman's Role

Greenstreet Berman Ltd are an independent consultancy who specialise in managing the human element of risk across a range of sectors and project areas. As well as previous work for the Food Standards Agency, we have also undertaken project work for the National Institute for Health and Clinical Excellence (NICE) and the Health and Safety Executive.

Greenstreet Berman will be facilitating today's event as an independent research organisation and so neither myself nor Paul will be expressing our own thoughts or opinions on the tool.

Your role

What we ask is for you to provide us with your open and honest thoughts and constructive feedback on the tool in its current form. The feedback and information you provide will then be used to help finalise the tool prior to its release through the FSA as a working Inspection Toolkit. Before we get started, I will ask you to now introduce yourselves, telling us your name, how long you have been working as an Environmental Health Officer/Food Safety Inspector and key challenges with respect to food safety and hygiene culture.

Agenda

This workshop will last for approximately four hours and will consist of the following sessions:

Time	Activity
10:30	Background and introductions
10:45	Outline of the Food Safety Culture Toolkit
11:00	Session 1: Hypothetical assessment of a Food business
11:45	Session 2: Rating & review of the toolkit
12:30	Lunch
13:00	Session 3: Face validity and importance of each question;
14:00	Session 4: General discussion and suggested amendments
14:30	Evaluation and event close

Outline of the Food Safety Culture Toolkit

The Food Safety Diagnostic Toolkit consists of 8 elements and 5 categories (a Matrix illustrating these has been provided in the centre of your tables). It is envisaged that through questions, observation and document review, inspectors will be able to explore the food safety culture of a business in relation to the 8 elements specified. These being:

1. Priorities and attitudes;
2. Food hygiene risk perceptions & knowledge;
3. Confidence in food hygiene systems;
4. Business ownership of food hygiene;
5. Competence, learning, training, knowledge etc.;
6. Leadership on food hygiene;
7. Employee engagement in review & development of food hygiene practices;
8. Communications & trust to engage in food hygiene & report issues.

Based on an exploration of each of the 8 elements, inspectors should be able to categorise the food business as one of the following 5 categories and provide targeted advice to enable improvements.

a) Amoral calculators;

b) Dependent;

c) Doubters;

d) Proactive compliers;

e) Leaders.

The facilitators will talk through the Matrix and how this would be used by an inspector.

Session 1: Hypothetical assessment of food business

Session objective: This session aims to test the application of the Toolkit to a business.

Think of a recent food business you have inspected, or a food business which you are particularly familiar with. With this business in mind we would like you to complete the food safety culture Matrix. You will therefore need to consider the business practices, leadership, knowledge and attitudes in relation to the 8 elements before categorising the business under one of the 5 categories.

We will allow you 15 minutes to do this individually before we then come together as a group to gather your feedback on using the Toolkit.

Session 2: Rating of the Toolkit

Session objective: This session aims to explore your comprehension, the applicability to small and micro businesses and cultural appropriateness of the elements and categories.

Task one - Please complete the following table, providing a rating of each element on a scale of 1 – 5 for the following aspects (1 being poor and 5 being excellent):

	Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
Comprehension (How easy is it to understand)								
Applicability (How relevant and appropriate is it to small and micro businesses)								
Cultural appropriateness (How successful is it at avoiding cultural biases)								
User friendliness (How easy is it to use the elements)								
Level of detail (Not overly detailed or concise)								

Task two

Please complete the following table, providing a rating of each category on a scale of 1 – 5 for the following aspects (1 being poor and 5 being excellent):

	a) Amoral calculators	b) Dependent	c) Doubters	d) Proactive compliers	e) Leaders
User friendliness (How easy is it to use the typologies)					
Level of detail (Not overly detailed or concise)					
Comprehension (How easy is it to understand)					
Applicability (How relevant and appropriate is it to small and micro businesses)					
Cultural appropriateness (How successful is it at avoiding cultural biases)					

Task 3: Group discussion

Questions to be explored through group discussion:

1. **What are your thoughts on the elements and their descriptions at the different levels?** (any ambiguities, thoughts on terminology used and length of descriptions given?).
2. **How did you find using the matrix to categorise organisational culture?** (was it clear and easy to use in terms of the grid structure and colour coding, did you gather the output you would have expected for the business you had in mind, was the format acceptable to use for an inspection?).
3. **What are your thoughts on the advice provided for inspectors on enabling improvements?** (is it inclusive enough, is the advice sufficiently and appropriately tailored to the categories of the business, is the advice appropriate for food safety inspectors to be providing to businesses?).

Lunch (30 minutes)

Session 3: Face validity and importance of each question

Session objective: This session aims to explore whether the Food Safety Culture Toolkit provides inspectors with an effective measure of food safety culture in food businesses,

along with identification of which elements are of greatest importance.

Task one

Please complete the following table, providing a ranking of each element with regards to its importance to the assessment of food safety culture (1 being most important – 8 being least important).

Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues

(Time dependent, facilitator to explore delegate rankings and their justification).

Task two

As a group, we would like to explore your thoughts on:

1. **To what extent do you believe the Toolkit provides an effective means of measuring food safety culture within food businesses? (why is this?)**

2. **To what extent does the Toolkit provide appropriate and constructive advice to help food businesses improve their food safety culture? (why is this?)**

3. **To what extent do the elements assess the key variables you believe to be important to food safety culture?**

(Facilitator to flip chart responses at front of room).

Session 4: General discussion and suggested amendments

Session objective: This session aims to explore your overall thoughts on the Food Safety Culture Toolkit and suggestions for how this could be improved.

As a group, we would like to explore the following two questions:

1. **What are your thoughts on the Food Safety Culture Toolkit?**

2. **How might the Food Safety Culture Toolkit be further developed?**

(Facilitator to flip chart responses at front of room).

Workshop evaluation (five minutes)

Return the evaluation sheets and notes to the facilitators.

Thank you for attending today's event. Your contributions are very much appreciated and will be used to finalise the Food Safety Culture Toolkit.

12.2 Food Business Operators

A TOOL TO DIAGNOSE FOOD SAFETY CULTURE IN FOOD BUSINESS

Food Business Operatives - TOPIC GUIDE

Introduction

Thank you very much for attending this workshop today run by Greenstreet Berman Ltd on behalf of the Food Standards Agency (FSA).

Introduce facilitators and observers

I am Paul Leach and I am the lead facilitator for today. My colleague Trevor Stockwell is the second facilitator who will scribe the main sessions and facilitate one of the sub-groups.

Housekeeping

Before we start today, I will just run through some basic housekeeping information:

- Location of toilets and fire escapes;
- Request that mobile phones be switched onto silent and any business critical calls be taken outside of the room to minimise disruption;
- Anonymity of information gathered;
- We will be recording the event and making notes as we move through the different sessions to ensure the accuracy of the write up; and
- There are no right or wrong answers, we value everyone's feedback and opinions and would ask that you show respect to your fellow attendees by speaking one at a time.

Background to the work

The Food Standards Agency has commissioned Greenstreet Berman Ltd to help develop a food safety culture diagnostic toolkit for use primarily by local authority food hygiene inspectors to assess food safety culture. This work is prompted in part by an outbreak of E. coli O157 in South Wales in 2005 and the publication of the Public Inquiry Report in March 2009 which brought renewed attention to the issue of cultures and behaviours in businesses and enforcement bodies and compliance with food hygiene legislation.

As part of this work, Greenstreet Berman Ltd have developed a Food Safety Diagnostic Toolkit for use by local authority food hygiene inspectors to identify aspects of good/poor food safety cultures in food businesses. The toolkit has been developed with particular consideration for use with micro and SME businesses in mind, however the tool is not intended to have exclusive application for such businesses. Underpinned by a review of food safety culture literature and existing toolkits and question sets from other industries, (including health and safety, process safety and the rail industry), we are now seeking your feedback to further develop the toolkit as it stands in its draft form.

Greenstreet Berman's Role

Greenstreet Berman Ltd are an independent consultancy who specialise in managing the human element of risk across a range of sectors and project areas. As well as previous work for the Food Standards Agency, we have also undertaken project work for the National Institute for Health and Clinical Excellence (NICE) and the Health and Safety Executive. Greenstreet Berman will be facilitating today's event as an independent research organisation and so neither myself nor Trevor will be expressing our own thoughts or opinions on the tool.

Your role

We have identified all delegates present at today's workshop as Food Business Operatives. What we ask is for you to provide us with your open and honest thoughts and constructive feedback on the Toolkit in its current form. The feedback and information you provide will then be used to help finalise the tool prior to its release through the FSA as a working Inspection Toolkit. Before we get started, I will ask you to now introduce yourselves, telling us your name, what business you own/work for and how long you have been working in the food industry. (60 seconds per person, go around the room gathering intro from each attendee).

Agenda

This workshop will last for approximately two hours and will consist of the following sessions:

Time	Activity
9:30	Background and introductions
9:40	Outline of the Food Safety Culture Toolkit
9:50	Session 1: Hypothetical assessment of your food business
10:20	Session 2: Review of the toolkit
11:05	Session 3: Suggested amendments
11:30	Evaluation and event close
12:00	Lunch

Outline of the Food Safety Culture Toolkit

The Food Safety Diagnostic Toolkit consists of 8 elements and 5 categories (a Matrix illustrating these has been provided in the centre of your tables). It is envisaged that through questions, observation and document review, inspectors will be able to explore the food safety culture of a business in relation to the 8 elements specified. These being:

1. Priorities and attitudes;
2. Food hygiene risk perceptions & knowledge;
3. Confidence in food hygiene systems;
4. Business ownership of food hygiene;
5. Competence, learning, training, knowledge etc.;
6. Leadership on food hygiene;
7. Employee engagement in review & development of food hygiene practices;
8. Communications & trust to engage in food hygiene & report issues.

Based on an assessment of each of the 8 elements, inspectors should be able to categorise the food business as one of the following 5 categories and provide targeted advice to enable improvements.

a) Amoral calculators;
b) Dependent;
c) Doubters;
d) Proactive compliers;
e) Leaders.

Facilitator to talk through the Matrix and how this would be used by an inspector.

Session 1: Hypothetical assessment of food business

Session objective: This session aims to test the application of the Toolkit to a business as well as your understanding of the matrix.

Using the food safety culture Matrix provided, consider your business in relation to the 8 defined elements, before categorising your business as one of the 5 categories.

Session 2: Rating of the Toolkit

Session objective: This session aims to explore your comprehension, the applicability to small and micro businesses and cultural appropriateness of the elements and categories.

Task one - Please complete the following table, providing a rating of each element on a scale of 1 – 5 for the following aspects (1 being poor and 5 being excellent):

	Priorities and attitudes	Food hygiene risk perceptions & knowledge	Confidence in food hygiene systems	Business ownership of food hygiene	Competence, learning, training, knowledge etc.	Leadership on food hygiene	Employee engagement in review & development of food hygiene practices	Communications & trust to engage in food hygiene & report issues
Comprehension (How easy is it to understand)								
Applicability (How relevant and appropriate is it to small and micro businesses)								
Cultural appropriateness (How successful is it at avoiding cultural biases)								
User friendliness (How easy is it to use the elements)								
Level of detail (Not overly detailed or concise)								

Task two

Please complete the following table, providing a rating of each category on a scale of 1 – 5 for the following aspects (1 being poor and 5 being excellent):

	f) Amoral calculators	g) Dependent	h) Doubters	i) Proactive compliers	j) Leaders
User friendliness (How easy is it to use the typologies?)					
Level of detail (Not overly detailed or concise)					
Comprehension (How easy is it to understand?)					
Applicability (How relevant and appropriate is it to small and micro businesses?)					
Cultural appropriateness (How successful is it at avoiding cultural biases?)					

Task 3: Group discussion

As a group please discuss the following questions:

1. **Did you find it easy to categorise your business using the matrix and do you believe this categorisation is accurate?**

2. **What are your thoughts on the advice to be given by inspectors to enable improvements in food safety culture?**

Session 3: Potential changes

Session objective: This session aims to explore whether the Food Safety Culture Toolkit provides an effective means of measuring food safety culture in food businesses, and gather your suggestions for further development.

As a group, we would like to explore your thoughts on:

1. **To what extent do you believe the Toolkit provides an effective means of measuring food safety culture within food businesses?** (why is this?)

2. **To what extent do you think that the Toolkit will help you to improve your business' food safety culture?** (why is this?)

3. **How might the Food Safety Culture Toolkit be further developed?**

(Facilitator to flip chart responses at front of room).

Workshop evaluation (five minutes)

Return the evaluation sheets and notes to the facilitators.

Thank you for attending today's event. Your contributions are very much appreciated and will be used to finalise the Food Safety Culture Toolkit.