Evidence Review on Regulation Culture and Behaviours

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Evidence Review on Regulation Culture and Behaviours

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Glossary

AHR	Alcohol-based hand rub
AO	Authorised Officer
BRE	The Better Regulation Executive, part of the Department for Business, Innovation and Skills tasked with leading the regulatory reform agenda across government.
CIEH	Chartered Institute of Environmental Health: an independent organisation representing the interests of the environmental health profession.
CWERC	Cardiff Work Environment Research Centre: co-authors of the current review.
Dutyholder	The individual or corporate body with the primary responsibility for meeting the legal requirements in the area under consideration: in the context of food safety this would be an FBO.
E.coli O157	*The* abbreviated name of *Escherichia coli* O157:H7, a strain of the bacterium *Escherichia coli* and a cause of foodborne illness.
EHO	Environmental health officer: an individual employed by a local government to advise on and enforce public health legislation and standards. They may be generalist or may specialise in specific areas, such as housing, occupational health and safety, food safety and food standards, environmental protection, waste management and pollution control.
EHP	Environmental health practitioner: see EHO definition.
EM	Enforcement Manager
FBO	Food business operator: a dutyholder whose activities fall under the jurisdiction of the FSA.
FSA	The Food Standards Agency: an independent government department set up by an Act of Parliament in 2000 to protect the public's health and consumer interests in relation to food.
FSMS	Food safety management systems.

HACCP	Hazard Analysis Critical Control Points: an internationally recognised system of managing and identifying food safety hazards and protecting consumers. Procedures based on HACCP are a requirement of EU food hygiene legislation that applies to all food business operators except farmers and growers.
HCW	Healthcare worker
HH	Hand hygiene.
HSE	The Health and Safety Executive: a non-departmental public body responsible for the encouragement, regulation and enforcement of workplace health and safety and welfare in England, Wales and Scotland.
IES	The Institute for Employment Studies: co-authors of the current review.
LA	Local authority: the local government bodies in the UK that have responsibility for official controls and enforcement of the main body of food law.
LA officers	Local authority officers: see EHO definition.
LACORS	Local Authorities Coordinators of Regulatory Services[1]: the local government central body responsible for overseeing local authority regulatory and related services in the UK.
LAEMS	The Local Authority Enforcement Monitoring System: a web-based system to which local authorities are able to upload data generated from the local system(s) on which they record data on food law enforcement activities and outcomes.
LRS	Law on individual rent subsidies: a form of housing benefit paid in the Netherlands when rent exceeds a certain proportion of taxable income.
MRO	Multiresistant organism
MRSA	A commonly used abbreviation for methicillin-resistant Staphylococcus aureus (S. aureus) bacteria. MRSA. S. aureus is sometimes termed a 'superbug' because of its ability to become resistant to several antibiotics.
OSH	Occupational Safety and Health
The Pennington Inquiry	The Public Inquiry chaired by Professor Hugh Pennington which inquired into the circumstances leading to the outbreak of E.coli O157 infection in South Wales in September 2005.
PPE	Personal Protective Equipment: all equipment and clothing which

[1] Now called Local Government Regulation

	is intended to be worn or held by a person at work and which offers protection against one or more risks to health and safety.
REA	Rapid Evidence Assessment: a tool for reviewing available research evidence as comprehensively as possible, within the constraints of a given timetable.
Regulatory burden	(Perceived) costs to dutyholders of complying with business regulations
RPE	Respiratory Protective Equipment
SFBB	Safer food, better business: a food safety model which has been produced by the FSA in England, to assist small businesses with the implementation of suitable management arrangements to control food safety within their business.
SME	Small or medium-size enterprise: defined by the European Commission as an organisation with fewer than 250 employees.

Executive Summary

The 2009 Public Inquiry chaired by Professor Hugh Pennington which inquired into the circumstances leading to the September outbreak of E.coli O157 infection in South Wales identified serious breaches of Food Hygiene Regulations as key causal factors. The Inquiry also identified poor food safety culture and inadequate enforcement action as contributory to the event. In response, the Food Standards Agency (FSA) recommended work should be carried out to better understand the culture and behaviours in businesses and enforcement bodies, as well as the communication between these two groups that facilitate or inhibit compliance with regulation. To start this work off, the Institute for Employment Studies (IES) and Cardiff Work Environment Research Centre (CWERC) were commissioned by the FSA to conduct an evidence review in this area. This work was presented in a report published in 2010.

The aim of the current review is to update the findings presented in the 2010 report by examining relevant evidence that has accumulated over the last four years. Like the previous review it was conducted according to the principles of a rapid evidence assessment, and a broad range of evidence was reviewed across a range of regulatory areas. As before, the overall aim of the review was to determine 'what works' in terms of culture and behaviour in securing compliance.

Like the 2010 review this review has found very little empirical evidence making a direct link between particular aspects of culture and behaviour within dutyholders and regulators, and levels of compliance. There is a proliferation of descriptive information about approaches that appear to work well, but little in the way of controlled studies which prove the advantages of particular interventions or modifications objectively.

To facilitate comparison with the previous report, this review's findings are presented under the headings similar to those used before:

Organisational context

Structural organisational characteristics (eg size, nature of business activity) can be linked, directly or indirectly with compliance and take-up of best practice. The evidence suggests:

- Although there appears to be a tendency for smaller businesses to be less compliant with regulations, the hospital hand hygiene literature suggests large organisations can struggle to meet hygiene standards too.
- Within the food sector, size alone does not always act as a useful predictor of compliance. For example the introduction of the Food Hygiene Rating Scheme and Food Hygiene Information Scheme (FHRS/FHIS) has shown that a large proportion of small FBOs are independently able to achieve high ratings.
- However, within the food sector, it is generally agreed that the larger the business the more likely they are to take on basic regulatory messages and implement structured approaches to food safety management.
- Financial constraints can impact on the degree to which the work environment is set up to optimise compliance. Lack of resources can manifest in terms of access to expertise, training and information, staff time or capacity (the presence of sufficient staff to be able to perform necessary tasks).
- Particular types of smaller FBOs have been linked with a tendency to comply less; these include food takeaways, those whose staff receive very low pay and FBOs in areas where there is rapid ‘churn’ of businesses closing and opening.
- Independent outlets appear to face more barriers than those as part of a franchise or chain: relative to the latter the former lack access to financial resources, standardised food safety practices, and it has been argued that they do not have their wider reputation/financial liability at stake to the same extent.
- There is some evidence that individual characteristics of staff may affect compliance; factors such as their proficiency in English, their skills background and employment status may impact on food safety behaviours.
- Recent evidence suggests that commercial interests can drive compliance in smaller as well as larger businesses. Findings emerging from the evaluation of the FHRS and FHIS are consistent with this.

Behaviour and modes of communication within dutyholding organisations

Many routine activities that take place within a business, particularly those that require communication, have a bearing on compliance. Key messages within the reviewed literature include:

- The role of managers and supervisors in encouraging and motivating employees to follow proper practices is critical. This includes indirect as well as direct influences: employees will pay attention to the actions of managers as

well as instructions they are given more explicitly and ‘role modelling’ desirable behaviours is therefore important.

- Worker participation or ‘worker involvement’ continues to be strongly advocated in the health and safety literature. This supports shared responsibility within workplaces, potentially enabling workers to raise the alarm about safety risks or management flaws that would otherwise go unchecked.
- An unwillingness to ‘speak out’ can result from practices where employees who have made mistakes are named and shamed.
- In the absence of formal training, workers depend on their managers and colleagues to communicate information about compliance to them in a manner that is understandable and persuasive.
- Addressing language barriers is critical. Use of graphics and supplementary materials is advocated with non-English speaking workers who may not fully understand generic training content.

Safety culture within dutyholding organisations

Organisations which demonstrate features of a positive safety culture are likely to be more compliant. These features include a commitment to safety among all staff, ‘ownership’ of safety issues and role modelling of compliant behaviours by managers. The evidence shows:

- Safety culture concerns groups of people (not individuals alone) within a business, how they interact, what an organisation is about and how they behave.
- There are multiple definitions of safety culture so it can be difficult to draw generalisations from relevant literature. Many studies discuss phenomena suggestive of a positive safety culture without using the term explicitly, adding to this difficulty.
- A value system that prioritises avoidance of harm appears an important feature. Informed perceptions of and attitudes towards risk are also key.
- Staff at all levels, managers in particular, have a role to play in creating and maintaining a positive food safety culture. Practical elements include ensuring that effective risk management systems are in place, and that these are communicated clearly to all staff.
- A culture of compliance is not possible when dutyholders do not perceive that adherence to particular regulations is either necessary or desirable within their own company. This can result in a reluctance to learn about compliance in the first instance and ultimately, non-compliance.
- Management commitment is a recurring theme in the international literature on safety and hygiene compliance. Another important attitudinal factor is a sense of taking ‘ownership’ for food safety.

- Attitudes towards risk have a major influence on compliance; if the potential consequences of foodborne hazards are not viewed as disastrous, this can lead to difficulties in engaging staff on the importance of food safety.
- Regarding hand hygiene specifically, problems with risk perception pervade the health care sector at all levels and the relationship between risk of cross-infection and staff compliance with hygiene procedures is complex. This presents a challenge for achieving hand hygiene compliance in hospital environments.
- Typologies classifying FBOs can be helpful, not just in terms of describing compliant behaviours but they also have the potential to be of practical use in assessing safety culture and guiding enforcement activities; it has been noted that a 'passive' mindset is one of the most problematic to deal with. Cost, time constraints and apathy can present barriers to compliance. These may be compounded by perceptions that compliance is burdensome or that an inspection system is unfair.

Behaviours and cultures within the enforcing organisation

The evidence that directly assesses cultures within enforcing bodies is relatively limited compared to that of dutyholders; more relevant evidence concerns enforcement activities. Regarding evidence quality, it should be noted that recent qualitative work commissioned by the FSA provides the majority of evidence on this topic. However some of the data is largely anecdotal and there is limited opportunity to compare or consolidate some of the evidence presented here with other sources. The evidence that is available indicates:

- There is potential for basic characteristics of the working environment to impact on the behaviours of food safety professionals. For example seating food teams close together in an office can facilitate discussion about regulatory decisions, potentially helping Environmental Health Officers (EHOs) resolve dilemmas encountered in their work with local businesses.
- Local authority restructuring potentially affects the time some staff are able to spend on food safety enforcement although the impacts of this have not been investigated empirically.
- Visits to FBO premises can serve a number of purposes and take a number of different forms. 'Pop-in' visits can foster ongoing dialogue and engagement with local businesses about food safety issues.
- Regarding inspection content, a bias towards visible evidence of food safety (such as cleanliness) has been reported in the past. However it appears that the introduction of HACCP and other new initiatives have been successful in orienting inspectors towards more systemic and cultural aspects.

- Using language that FBOs can relate to is important. When describing food hazards, qualitative descriptions rather than statistics are easier to understand and potentially have more impact.
- The sense of duty LA enforcers have towards public health is upheld concurrently with a commitment to supporting the local economy. Enforcers are conscious of the legacy of major incidents such as the 2005 South Wales E.coli outbreak (potentially prompting a more risk-averse approach) but also aware of the need for regulation to be less burdensome to business as recommended by the Hampton Review (2005).
- Raw inspection scores can be poor predictors of foodborne illness: however EHOs tend to take an approach with a much broader definition of success than improved compliance ratings and look for (often subtle) qualitative indicators such as shifts in FBO mindset and evidence that food safety messages have been understood.
- Enforcement action is viewed by EHOs as a last resort for most types of business: sole use of enforcement risks FBOs not understanding their contraventions and how best to rectify them.
- Enforcement strategies should be responsive to the prevailing culture within food businesses; there is no ‘one size fits all’ strategy to secure compliance. The provision of advice and education are seen as key elements of the inspector role and the application of enforcement measures represents only one aspect.
- Inspectors strive to take a partnership approach to enforcement, with enforcers and businesses working together to achieve regulatory compliance. This is said to be particularly effective with regard to helping small businesses to understand and meet their responsibilities more easily.

Interventions to promote compliance

There is large amount of evidence both within and beyond the food safety literature on measures (other than those concerned with enforcement) to improve compliance. These are mainly focused on training and monitoring.

- Local authority food safety enforcers have welcomed the national hygiene rating schemes (the Food Hygiene Rating Scheme and Food Hygiene Information Scheme) as an approach to improving standards. There is a widespread perception that the implementation of the schemes has driven up food safety scores although to date there is no hard data that categorically proves cause and effect.
- More widely, certification and awards schemes appear to be effective in driving compliance. These tap into company motivations to remain competitive and win consumer confidence.
- Work in the USA has highlighted the importance of addressing ethnic diversity within local communities; this has been done by formally developing the ‘cultural

competence' of their staff to help establish a trust relationship with the local FBOs.

- Existing relationships within supply chains can potentially be exploited to disseminate good practice. However the scope to do this is bound by the prevailing cultures within a particular sector or supply chain, and also by the practical nature of risks that need to be managed.
- Knowing how to comply is an important first step towards compliance but is not a guarantee of it, and recall of training content can falter over time. The duration over which training has an impact is uncertain and regular updates are often needed to ensure compliance is sustained.
- Levels of knowledge among staff can differ across safety topics: an awareness of strong and weaker areas can be helpful in targeting future training appropriately. Educational materials need to be kept up to date with respect to new food technologies and food preparation techniques.
- Food handlers should be constantly reminded of their crucial role in ensuring safe food for consumers because they are the food service–customer interface: potential negative outcomes of non-compliance such as foodborne illnesses should be emphasised.
- Ideally training evaluations should have longer follow-up periods than traditional studies typically allow, to assess the extent to which improvements in compliant behaviour are sustained in the long term.
- The only reliable measure of effectiveness of food safety interventions material is through direct observation of food preparation practices, highlighting a need for food safety researchers to gather data on actual practices of food handlers.
- Regarding hand hygiene specifically, it has been suggested that FBO managers could monitor the use of soap and paper towels. The amount of these items consumed would provide some indication of handwashing behaviour over a particular period.
- In hospitals, electronic devices have been successfully employed to monitor hand hygiene compliance, while in food processing plants CCTV has been used. However these approaches may not be practical or affordable for small FBOs.
- Barriers to compliance need to be understood fully in the design of training and other interventions; the Theory of Planned Behaviour (Godin and Kok 1996) offers a useful framework for this approach.
- Training needs to be affordable, practical and in context. Simplicity and relevance is a key requirement. Information should be task specific and learners should not be overburdened with irrelevant information.
- To overcome attitudinal ambivalence when trying to convey risk messages to food handlers, qualitative descriptions (eg, details about people made ill by food

poisoning) is more successful than a quantitative information (eg, statistics about food poisoning).

- Visual material should be hard hitting and the placement and prominence of signs should be fully considered in relation to activities being targeted.
- Compliant worker behaviour appears best reinforced via the use of multiple channels of feedback, including management communication combined with feedback on performance levels. Hand hygiene in particular is viewed as a complicated behaviour and appears to benefit from a multifaceted approach to feedback provision.
- Incentive schemes which award prizes for best compliance over a particular period can also motivate employees.

Main findings of the evidence review

Like the 2010 review this review has found very little empirical evidence making a direct link between particular aspects of culture and behaviour within dutyholders and regulators, and levels of compliance. There is a proliferation of descriptive information about approaches that appear to work well, but little in the way of controlled studies which prove the advantages of particular interventions or modifications objectively.

Research Question 1: Who does/does not comply and why?

The literature indicates that SMEs are less compliant than larger businesses across enforcement areas including food safety. Among smaller FBOs in particular, cost, time constraints and apathy can present barriers to compliance. Due to economies of scale the costs of compliance for SMEs can be substantially higher than in larger businesses and these costs (or perceptions of these costs) can deter compliance. These factors may be compounded by perceptions that compliance is burdensome or that an inspection system is unfair.

Particular types of smaller FBOs have been linked with a tendency to comply less; these include food takeaways, those whose staff receive very low pay and FBOs in areas where there is rapid ‘churn’ of businesses closing and opening**.** Size alone however is not always a useful predictor of compliance. The introduction of the Food Hygiene Rating Scheme and Food Hygiene Information Scheme (FHRS/FHIS) has shown that a large proportion of small FBOs are independently able to achieve high ratings. Also, outside the food industry, the hospital hand hygiene literature suggests large organisations can struggle to meet hygiene standards too.

There is also a barrier to compliance when dutyholders do not perceive adherence to particular regulations as either necessary or desirable within their own company. This can result in a reluctance to learn about compliance in the first instance and ultimately non-compliance. Although the provision of formal training should improve levels of food hygiene, it is not clear whether improved knowledge

translates into compliant behaviour, and when it does, how long this is sustained (see next Research Question below).

There is a clear consensus that a positive safety culture encourages compliant behaviour and greater adherence to relevant management systems which support compliance. However there are multiple definitions of safety culture (and not all are necessarily applicable to smaller FBOs) so it can be difficult to draw generalisations from the reviewed literature. Also, many studies discuss phenomena suggestive of a positive safety culture without using the term explicitly, adding to this difficulty.

Despite the complexity of the literature, it is possible to draw out some broad features of a positive safety culture. A key attitudinal factor is a sense of taking 'ownership' for food safety. A value system that prioritises avoidance of harm is an important feature, as are informed perceptions of and attitudes towards risk. Management commitment is another recurring theme. Staff at all levels, managers in particular, have a role to play in creating and maintaining a positive food safety culture. Practical elements include ensuring that effective risk management systems are in place, and that these are communicated clearly to all staff.

A negative safety culture has poor compliance with regulatory requirements and low perceptions of importance towards food safety in relation to other business priorities. Attitudes towards risk have a major influence on compliance since behaviours are often determined by individual judgements of risk rather than actual risk. This is linked to a perception that legislative requirements are largely irrelevant and that compliance will not actually improve safety standards. Also, if the potential consequences of foodborne hazards are not viewed as disastrous this can lead to difficulties in engaging staff on the importance of food safety.

In the food literature some recent studies have helped shed light on what different safety cultures look like by defining 'typologies' with respect to clusters of attitudes and behaviours demonstrated within FBOs. The typologies are linked to levels of compliance and/or sustained compliance. These illustrate a tendency, for example, for dutyholders who are only moderately compliant to approach compliance more passively than others and to see inspectors as guardians of public health, rather than themselves. In contrast there is a tendency for organisations who take more ownership of food safety to be more proactive and be more inclined to seek advice and information from enforcement professionals.

Involving workers in the design of risk control measures can be effective in encouraging their co-operation. This supports shared responsibility within work places, potentially enabling workers to raise the alarm about safety risks or management flaws that might otherwise go unchecked.

Research Question 2: What approaches/communications are more/less effective in securing regulatory compliance?

The evidence review for the FSA on this topic four years ago found a lack of evidence about the types of organisational cultures within enforcing bodies that (do or do not) secure compliance. Some evidence has accumulated over the last

four years that refers to this, however as reported in 2010 the impact of different ways of working within regulatory units cannot be determined. Nevertheless FSA's own evidence suggests that good communication within food safety enforcing teams improves individual decision making and aids internal consistency with regard to enforcement approach. It also appears that situational aspects of the job such as an open office layout can encourage interaction and facilitate a team approach.

There is agreement within relevant literature that enforcement strategies should be responsive to the prevailing culture within food businesses; there is no 'one size fits all' strategy to secure compliance. Typologies classifying FBOs according to their behaviours and attitudes have the potential to be of practical use in assessing safety culture and guiding enforcement activities. The inclusion of 'confidence in management' (CIM) as an official risk category has been welcomed by many enforcers for the opportunity it provides to look beyond the most evident displays of compliance towards what they viewed as a better indication of a compliant mindset and an ability to sustain compliant behaviour.

The provision of advice and education are seen as key elements of the inspector role and the application of enforcement measures represents only one aspect. Visits to FBO premises can serve a number of purposes and take a number of different forms. For example, the value of 'pop-in' visits was emphasised by enforcers with respect to fostering ongoing dialogue and engagement with local businesses about food safety issues. Regular but brief visits of this type were also said to be particularly useful in ensuring passive and reactive FBOs sustained their levels of compliance.

LA food safety enforcers are sensitive to commercial concerns and the desire to help local businesses remain in operation where safe to do so. However there is a belief that many improvements non-compliant businesses implement in response to enforcement action are not sustained. The Food Hygiene Rating Scheme and Food Hygiene Information Scheme (FHRS) have been welcomed by enforcers as an approach to improving standards. There is widespread agreement that the implementation of the schemes has driven up standards although to date there is no hard data available that categorically proves cause and effect.

With regard to the schemes, there is confidence that scoring consistency within LAs is at an acceptable level. However evidence suggests that across different LAs consistency can be problematic and training in this area is seen as valuable. The international literature highlights a need to keep training materials up to date with respect to new food technologies and food preparation techniques.

Budgetary constraints within local government could affect the way food safety enforcers work currently, or in the future. There is some concern surrounding increasing pressures on LA enforcers to adopt additional regulatory roles (eg health and safety, trading standards) outside their food safety specialisation; a worry is that this may have a negative impact on time they can allocate to food safety enforcement.

Research Question 3: What encourages sustained compliance?

The research that explicitly focuses on sustained compliance focuses on three main areas: supervision, training and monitoring, with respect to activities of that type that are principally provided by the employer.

Knowing how to comply is an important first step towards compliance but is not a guarantee of it, and recall of training content can falter over time. The duration over which training has an impact is uncertain and regular updates are often needed to ensure compliance is sustained.

In terms of influences on compliance within businesses, the role of managers and supervisors in encouraging and motivating employees to follow proper practices is critical. This includes indirect as well as direct influences: employees will pay attention to the actions of managers as well as instructions they are given more explicitly and 'role modelling' desirable behaviours is therefore important.

In the absence of formal training, workers depend on their managers and colleagues to communicate information about compliance to them in a manner that is understandable and persuasive. 'Role models' who demonstrate compliant behaviours can positively influence the behaviour of junior staff in catering organisations. This also applied to health and safety behaviours in other sectors such as construction. However studies suggest that in some hospital settings consultants fail to set a positive example to other, more junior staff with respect to hand hygiene.

Barriers to compliance need to be understood fully in the design of training and other interventions; the Theory of Planned Behaviour offers a useful framework for this approach. Barriers and negative attitudes can then be targeted in educational interventions to improve behavioural intent. Managers and supervisors should emphasise the positive outcomes of hand washing (e.g., safe food, less recall, and more profit for the company and workers) and potential negative outcomes (e.g., foodborne illnesses, product recall and lost business or bankruptcy). Developing materials that guide dutyholders through the processes in ways that conserve time and cost can also help overcome perceived barriers to compliance.

Training needs to be affordable, practical and suitable for the environment in which it will be applied. Simplicity and relevance to job tasks undertaken are also key requirements. Information should be task specific and learners should not be overburdened with irrelevant information. Addressing language barriers is critical. Use of graphics and supplementary materials is advocated with non-English speaking workers who may not have fully understood the original training content.

Compliant worker behaviour appears best reinforced via the use of multiple channels of feedback, including management communication combined with feedback on performance levels. Hand hygiene in particular is viewed as a complicated behaviour and appears to benefit from a multifaceted approach to feedback provision. Ideally, training interventions should be closely followed by communication and feedback.

In healthcare, hand washing appears to be highly influenced by the presence of other members of staff (or members of the public) who may be observing. In hospitals electronic devices have been successfully employed to monitor hand hygiene compliance, while in food processing plants CCTV has been used. However these approaches may not be practical or affordable for small FBOs. Regarding hand hygiene specifically it has been suggested that FBO managers could monitor the use of soap and paper towels. The amount of these items consumed would provide some indication of handwashing behaviour over a particular period.

Supervisors and managers should create an environment that cultivates compliant behaviour by putting up posters and reminders (in the workers' native languages) and continually model desirable behaviour themselves. Visual material should be hard hitting and the placement and prominence of signs should be fully considered in relation to the environment in which targeted activities are routinely undertaken.

Research Question 4: What incentives and deterrents have been shown to achieve and maintain compliant behaviour, and what more can business bodies and enforcement agencies do to improve their position?

Evidence suggests that commercial concerns are of increasing importance in terms of incentivising food safety as well as other regulations such as health and safety. This applies in the context of international food trading as well as chains of supply based wholly within the UK. For example many food producers and manufacturers are required to meet regulatory requirements such as ISO 22000 and HACCP in order to participate in markets that trade across international boundaries.

Recent evidence suggests that commercial interests can drive compliance in smaller as well as larger businesses. Findings emerging from the evaluation of the Food Hygiene Rating Scheme and Food Hygiene Information Scheme (FHRS/FHIS) are consistent with this and the scheme has also been welcomed by enforcers as an approach to improving standards. Available evidence suggests that the majority of businesses view it as important to have a rating inspection result that was higher than other businesses in their area. Also, there is widespread agreement that the implementation of the schemes has driven up compliance although to date there is no hard data available that categorically proves cause and effect. The scheme is not likely to be a catch-all remedy however, especially where resistance to compliance is entrenched. Among inspectors there is a view that there is a core group of low performing food business operators who will not implement positive changes without a revisit as a deterrent.

At a within-company level, incentive schemes which award prizes for best compliance over a particular period can also motivate employees. Promotions such as 'Hand Hygiene Week' could be used in conjunction with monitoring to facilitate this, although monitoring may be impractical within smaller FBOs, due to

resource limitations. Also the awarding of prizes within very small workforces or family businesses may be inappropriate.

Lessons can potentially be learned from the healthcare context where it has been advised emphasis should be placed on clinicians' moral and ethical obligations with respect to hand hygiene compliance, as part of training and orientation. Food handlers should be constantly reminded of their crucial role in ensuring safe food for consumers because they are the food service-customer interface.

Recommendations for further research

On the basis of the reviewed evidence a number of areas for targeting future food safety research and policy development are suggested.

Ensure future studies consider compliance as an outcome

Like the 2010 review this review has found very little empirical evidence making a direct link between particular aspects of culture and behaviour within dutyholders and regulators, and levels of compliance. There is a proliferation of descriptive information about approaches that appear to work well, but little in the way of controlled studies which prove the advantages of particular interventions or modifications objectively.

One difficulty in establishing effectiveness of various approaches on compliance is that this requires observations of actual behaviour, ideally when workers or managers do not know they are being watched (when they are susceptible to 'Hawthorne effect' phenomena). CCTV offers one approach to monitoring but there appears to be only limited use of this in food hygiene research,

More research which analyses dutyholder behaviour as an outcome is desirable. Some innovative indicators of compliant behaviour have been applied in relation to hand hygiene behaviours such as monitoring consumption of soap, paper towels etc. Innovative methods which allow objective study of other aspects of food safety-related activities (such as cooking, handling and storing foods) could facilitate more research studies that look at wider aspects of FBO practice. In order to properly investigate the cultures and behaviours which lead to compliance, future studies should include indicators of compliance as principal outcome measures. Independent judgements of compliance should be obtained for this purpose (ie not from employees' own assessment of their performance).

In order to identify factors that lead to sustained compliance, future studies would need to include a longitudinal component. This would necessitate monitoring compliance over a substantial time period and, although this is a resource-intensive approach, it would go some way to improving the current evidence base.

Continue to examine first-hand experience of enforcers

In the previous review for the FSA a major barrier to addressing several of the central research questions was the lack of evidence detailing cultures and

behaviours with regard to LA regulatory activity and the role these played in enforcement. Two pieces of work commissioned by the FSA (along with another small amount of academic literature) have since gone some way to addressing this gap. However that evidence base is both small and arguably - due to its exploratory and qualitative nature - anecdotal. Nevertheless those materials were valuable to this review and allowed greater insight into potentially important cultural and behavioural factors among enforcers than was possible in the 2010 review.

With respect to gathering evidence in future, it is evident the new FHRS/FHIS schemes represent an important shift in the context in which inspectors operate. It is envisaged that the final evaluation report on these initiatives will shed light on any significant changes in regulatory activities and EHO decision-making that may accompany this shift. When considered alongside the findings of this report, this new evidence may be indicative of areas which merit formal investigation, and the application of rigorous approaches and which allow, for example, hypothesis testing.

Other aspects of a changing regulatory context may also merit investigation with respect to enforcement practices, such as the compulsory display of FHRS ratings in Wales. Another area where evidence is currently lacking concerns the reported increasing pressures on LA enforcers to adopt additional regulatory roles (eg. health and safety, trading standards) outside their food safety specialisation; a potential consequence is that may have a negative impact on the time some professionals are able to allocate to food safety enforcement.

Although the full regulatory impact of the above changes is not likely to be seen for some time, it would appear important to monitor this on an ongoing basis. The Local Authority Enforcement Monitoring System (LAEMS) database (which was not within the search remit of this review) may be informative in this respect.

Consider applicability of findings from outside food industry carefully and purposefully target any new evidence search towards sectors /enforcement regimes with known similarities to food and food safety

While this review has aimed to draw on material from a range of regulatory contexts two main areas dominate in the literature identified outside the food industry, namely hospital hand hygiene and health and safety.

The apparent recent proliferation of hand hygiene literature appears to be a knock-on effect from a high-profile campaign led by the World Health Organisation. This was launched in 2009, ie between this review and the last one. Although this evidence base has yielded findings that are acceptably relevant to the main research questions, there are marked differences in the organisational cultures of hospitals and food businesses and it is arguably not always appropriate to transfer knowledge from the healthcare sector to food safety. The size and hierarchical nature of most healthcare settings differs radically from smaller food businesses, also the nature and scale of the risks are very different, not least due to the physical vulnerability of members of the public who are present in that

environment. The impact of these contextual differences on hygiene practices is a potential avenue to explore in research.

Fewer relevant HSE reports were identified than expected in the literature search (even when the relatively narrow time frame criterion for the current report is considered). This may result from a scaling down of its research outputs in some policy areas in recent years. There is a strong focus on construction in many of the identified reports, an industry where many (although not all) safety risks are visible, and usually of direct consequence to the wellbeing of the worker and their colleagues. Many of the drivers for compliance are therefore of a different nature from those associated with food safety: as a consequence, the focus of training and other interventions designed to improve compliance has a different emphasis. This does not necessarily preclude knowledge transfer however particularly in regard to construction safety measures which are designed to protect the wellbeing of the general public on or around the worksite. It could therefore be helpful to clarify the scenarios where the latter is the case and explore any potential lessons for food hygiene

Policy recommendations

Consider exploiting supply chain influences

Work in the area of health and safety has explored the main ways existing relationships within supply chains can be exploited to disseminate good practice. The scope to do this is bound by the prevailing cultures within a particular sector or supply chain, so a good understanding of mechanisms by which FBOs conduct business (details of which lie outside the remit of this review) would be essential for formulating policy in this area. Some strategies that have been used in the construction sector centre on the supply of equipment and materials and ensuring that compliance-related information is supplied at the point of purchase or hire. There may be scope for this type of approach to be used with respect to suppliers to FBOs; approaches analogous to those used in the construction industry could possibly involve the provision of food safety and hygiene information with products and equipment used in food preparation (it should be noted however the review did not find research that explored this idea in the food sector).

Adopt proven ‘shock tactics’ to influence behaviour

The recent WHO hand hygiene campaigns have inspired a number of high profile campaigns around the world to improve practice in this area within healthcare. The use of slogans and materials that emphasise potential loss of life have been used extensively in this context. While food safety risks are different, in terms of both risk type and risk control (eg the primary pathogen of concern in hospitals is norovirus against which alcohol hand rubs are an effective measure; this is not the case for most foodborne pathogens) some of the ‘shock tactics’ and hard-hitting visual material which highlight the potential human costs of non-compliance may be applicable for use in kitchens (and possibly bathrooms) in FBO premises. Evidence suggesting that workers respond more strongly to qualitative

descriptions of potential harm than statistics (about sickness or fatalities) should also be considered.

Consider that high FHRS/FHIS ratings may not signify that safety culture is in place

This review found evidence originating outside the UK that raw inspection scores can be poor predictors of foodborne illness, although no UK data was found which shed further light on this. This review did find however that UK enforcement personnel tend to take an approach with a much broader definition of success than improved compliance ratings and look for (often subtle) qualitative indicators such as shifts in FBO mindset and evidence that food safety messages have been understood. This would appear to be an important area for policymakers to bear in mind when considering the extent to which high-rating establishments merit continued attention from food safety inspectors. On the basis of the reviewed evidence it would appear that systems of scoring used in inspections (particularly those that focus on aspects of safety culture identified in Chapter 6 such as 'compliant will' and 'ownership of compliance') could potentially identify areas where advice/intervention is required even where awarded FHRS/FHIS ratings are high.

Explore the utility of using caricatures and 'typologies' of businesses in guidance for enforcers

Classification systems for dutyholders have been developed in recent research projects conducted for the FSA which describe FBOs as, for example, 'amoral calculators' (Wright et al, 2012) or 'disinterested' (Bukowski et al, 2012). These terms are intended to reflect the standard of aspects of food safety culture within particular organisations. These classifications or 'typologies' may be directly applicable in the context of inspections; for example food businesses meeting criteria for the above (negative) safety culture descriptors could be targeted for particular interventions or forms of enforcement action. This recommendation ties in with the one above with respect to the importance of using safety culture criteria that go beyond 'raw scores'.

1 Introduction

This chapter provides an overview of the policy background and circumstances which led to this review of evidence being undertaken for the FSA. It also sets out the review's aims and objectives and the research questions that it addresses.

1.1 The Pennington Inquiry

The Pennington Inquiry was published in 2009 and documents the circumstances surrounding the outbreak of *E.coli O157* in South Wales in 2005. The Inquiry report identified serious and repeated breaches of Food Hygiene Regulations by the food business operator (FBO) involved (Tudors). A contributing factor to these breaches was considered to be the nature of the FBO's poor food safety culture.

> *'The culture that emerged [within Tudors (FBO)] was one of little regard for the importance of food safety but where making and saving money was the priority ... additional resources should be made available to ensure that all food businesses … have in place an effective, documented, food safety management system which is embedded in working culture and practice.'*
>
> (Pennington 2009, p.85)

Inspection and auditing procedures also came under criticism; for example, the report concluded that the inspections did not assess or monitor the business' management of food safety as well as they could, or should, have done and that there was insufficient focus on identifying and assessing working practices and procedures to ensure that the HACCP plan was being applied in practice.

The Report made 24 recommendations, which included ensuring food businesses understand and implement the principles of HACCP[2] adequately, putting in place

[2] Hazard Analysis and Critical Control Point (HACCP) is an internationally recognised way of managing food safety and protecting consumers. It is a requirement of EU food hygiene legislation that applies to all food business operators except farmers and growers. It is a

measures to ensure effective enforcement, and a review of the FSA guidance for enforcement officers and businesses.

1.2 Aim of the 2010 review

In July 2009 the FSA Board agreed that the Agency should take the lead in addressing the Report's findings and recommendations that lay within the Agency's remit (FSA 2009)[3]. In particular, the FSA Board recognised that: *'the two main challenges presented by the Inquiry are to tackle businesses that share Tudors' attitude and to engender a proactive, inquisitorial approach by those who inspect and audit those operators' procedures – in other words a culture that is interested in achieving outcome rather than fulfilling a task. Factors that affect communication between FBOs and food enforcement officers need to be better understood'* (FSA 2009, p.9). The FSA commissioned IES and CWERC to carry out the 2010 evidence review with the following aim:

> *'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'*
>
> (Wilson et al 2010b, p.2)

1.3 Aim of the 2014 review

The aim of the current review is to update the findings presented in the 2010 review by examining relevant evidence that has accumulated over the last four years. Specifically the work aims to 'pool together existing evidence the agency possesses on regulation, cultures and behaviours [and also] the evidence base should be updated with any additional research which was not part of the previous review and has been conducted since[4].'

Like the previous review it was conducted according to the principles of a rapid evidence assessment, and a broad range of evidence (including qualitative as well as quantitative studies) was reviewed across a range of regulatory areas. As before, the overall aim of the review was to determine 'what works' in terms of culture and behaviour in securing compliance. Also consistent with the previous review a number of specific questions were of interest to the FSA:

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preventative approach to food safety based on seven principles that provide a systematic way of identifying food safety hazards and making sure that they are being controlled day-in, day-out.

3 Annex 1 of the paper provides an overview of FSA activity since 2005.

4 FSA Invitation to Tender, September 2013

- Who does/does not comply and why?
- What approaches/communications are more/less effective in securing regulatory compliance?
- What encourages sustained compliance?
- What deterrents and incentives have been shown to achieve and maintain compliant behaviour, and what more can business bodies and enforcement agencies do to increase compliance?

In line with the main aims of the review the research questions are addressed principally in terms of the *behaviours* and *cultures* which drive compliance, ie factors primarily concerned with demographic, behavioural and psychosocial features of employers and organisations of interest. The review takes an approach from a dual perspective, examining both employers and enforcers, and communication between the two.

In order to provide continuity and facilitate comparison between the two pieces of work, this report follows a broadly similar format to that used in the original 2010 report. Chapters 3, 4 and 5 deal with structural, behavioural and cultural factors that impact on compliance with respect to dutyholders. Chapter 6 focuses on enforcement approaches while Chapter 7 describes workplace interventions to boost compliance and presents evidence on their effectiveness. The conclusions presented in the final chapter are presented under headings which reflect the main research questions, followed by a summary of recommendations for policymaking and further research.

2 Methodology

This section of the report outlines the scope of the review, its approach and the details of the evidence base used. We also set out the main stages of the review process in detail.

2.1 Pooling exercise

At the beginning of the review process the Agency identified key pieces of food safety literature for inclusion in a pooling exercise to be carried out prior to the main review phase. These consisted of both published and unpublished sources of evidence possessed within the Agency. These were assessed for relevance and quality and where applicable retained for formal review in the main phase. A short report was prepared for the Agency summarising findings from the pooling exercise.

2.2 Scope of the review

An important aim was to extend the review to areas outside food safety regulation to enable the FSA to obtain transferable knowledge about 'what works' to secure compliance in a wider context. This aim guided the selection of academic databases searched which was not restricted to food safety and was inclusive of other domains viewed by the FSA as relevant, namely health and safety and hospital hand hygiene.

With respect to sources of grey literature the Health and Safety Executive's (HSE) database of research reports was considered a key resource for the literature search. As was the case for the 2010 review the UK health and safety literature was considered highly relevant in the context of the questions under investigation in this review bearing in mind (i) the similarity and partial overlap of sectors receiving food safety and health and safety inspections by local authority officers, and (ii) the fact that many local authority officers work to enforce health and safety alongside food safety.

The search for evidence covered documents published since the last review, ie (April 2009 - February 2014) and primarily focused on evidence from Europe and

North America. However, some papers originating from other nations were identified and, in agreement with the FSA, only documents from non-OECD countries were excluded on the basis of country of origin.

Checks were made to ensure that this review did not miss any relevant information from a recent key publication on food safety management (Hutter, 2011). These checks showed that pertinent findings referenced in this publication originated from sources published prior to the period covered by the last review.

2.3 Sources of evidence – academic literature and grey literature

This evidence review considered two main types of evidence: academic literature and 'grey literature' (the latter is defined below). In total, nine search engines were used to capture suitable academic literature. These search engines are listed in Appendix 1.

Grey literature was accessed mainly via the FSA pooling exercise and the HSE website. In the context of the current review, grey literature covered relevant material not published in academic journals, including research reports, technical reports and commissioned literature reviews. The grey literature reviewed in this study originated entirely from UK sources largely as a consequence of the search strategy.

2.4 Search terms and search strategy

As with the previous review conducted in 2010, a 'Rapid Evidence Assessment' (REA) approach was adopted which followed the broad principles of a systematic review but with greater constraints applied to the search. In order to yield an evidence base that was both broad and of a manageable size, search parameters were purposively chosen to limit the volume of literature generated while at the same time providing an informative, relevant and wide-ranging representation of available evidence.

Following consultation with the FSA it was agreed that 'document title' would be used as the main search field in order to restrict the volume of captured documents to a size that could be reviewed in the time available. Scoping work confirmed that a similar review approach with different search fields would capture many thousands more papers within the academic literature. The chosen approach allowed the review to take a broad approach while adopting the principles of systematic inquiry and remaining replicable.

Drawing upon the review's main research questions, seven primary terms were identified for the search, namely '**attitudes**', **'behaviour', 'communication', 'culture'**, **'enforcement'**, **'hygiene**' and **'safety'** in combination with the secondary terms **'food safety', 'safety legislation' and 'hygiene'**. These are set out in Appendix 1, alongside the combinations of these terms which were used in the search process.

2.5 Details of the search process

The search process consisted of a series of distinct stages. A flow chart illustrating the volume of documents processed and rejected at the various stages is included in Appendix 5.

2.5.1 Search

Once the scope of the review and review strategy was agreed with the FSA, searching of the available literature was undertaken using the electronic databases listed in Appendix 1. These were agreed with the client with the explicit intention of capturing evidence spanning a range of approaches and disciplines.

A consistent approach to the search process was taken across search engines as far as possible. For example some databases did not permit exclusion of documents published prior to 2010 at search stage and these had to be filtered out retrospectively.

For the HSE database it was found that using just the document's title as the search field was too restrictive and resulted in capturing only a handful of documents. In order to improve the chances of capturing relevant HSE research reports, the full text was used as a search field. This variant of the general search strategy is shown in Appendix 2.

2.5.2 Sift

Following the search process and prior to proceeding with the formal review stage, each document was subjected to a sift process. The sift criteria were devised with the primary aim of excluding (i) sources of poor quality evidence and (ii) documents not containing evidence relevant to any of the research questions. The sift pro-forma is included in Appendix 3, which sets out the applied criteria in detail.

In order to manage the process efficiently, an initial sift was conducted on the basis of title and/or abstract. For academic papers, this removed the need to acquire the full-text version and the time/expense involved. Grey literature tended to contain executive summaries, which could be used at this stage in place of abstracts.

Full-text versions of documents were obtained for all references not excluded at the initial sift stage. At this stage (ie on the basis of reading entire documents), it became clear that some documents did not contain findings pertinent to the review, although they may have contained relevant themes. Some further documents were excluded at this point. This is referred to in Appendix 5 as 'sift phase two' although in practice it did not constitute a separate methodological stage: the same proforma was retained and identical criteria were applied in making a judgement regarding each document's suitability for review.

In general, on the basis of the title, abstract or full text, it was clearly apparent whether a document should be excluded at the sift stage. Where this was not the case, the decision was reached by two researchers.

All remaining documents were subjected to the review process, and details such as author, title and other identifiers were entered into an Endnote database.

2.5.3 Review and extraction of findings

For each document remaining after the sift process, a comprehensive review pro-forma was completed. The intention was that the pro-forma would:

- facilitate classification of documents according to type (academic, grey literature), methodological approach (quantitative, qualitative, literature review etc) and subject area (eg health and safety, food safety, hand hygiene),
- provide a structure that would facilitate the recording of key methodological features and analytic approaches,
- standardise the extraction of relevant findings for inclusion in the report, and provide a basis for organising the findings under the various chapter headings.

A copy of the final pro-forma is included in Appendix 6. This was reformatted as a single Excel spreadsheet to facilitate comparison across evidence sources.

Following consultation with the FSA a decision was made not to grade or weight documents according to methodological quality; due to the applied nature of the research, many studies were not suited to the application of established scales (such as the Maryland Scale of Scientific Methods; Sherman et al., 1997). Instead the pro-forma served primarily to eliminate low quality evidence and to check that there were no major methodological shortcomings which rendered findings from individual papers unsuitable for inclusion in the final report. Specifically the following types of documents were eliminated:

- papers where methodology was not explicit or fully specified,
- conference abstracts not linked to a full paper,
- documents which appeared to be ‘opinion pieces’ (ie those not citing evidence),
- theses and dissertations.

The tables presented in Appendix 6 categorise the evidence sources included in the review by document type, subject area and methodology. As with the similar review conducted in 2010, it is important to note that, as a rapid evidence review, this piece of work is susceptible to some degree of bias (in particular with regard to its emphasis on HSE and FSA activities) and limitations in terms of content. The findings presented in this report, therefore, should be interpreted with those limitations in mind.

3 Organisational Context

Chapter summary

- Although there appears to be a tendency for smaller businesses to be less compliant with regulations, the hospital hand hygiene literature suggests large organisations can struggle to meet hygiene standards too.
- Within the food sector, size alone does not always act as a useful predictor of compliance. For example the introduction of the Food Hygiene Rating Scheme (FHRS) and Food Hygiene Information Scheme (FHIS) has shown that a large proportion of small FBOs are independently able to achieve high ratings.
- However, within the food sector, it is generally agreed that the larger the business the more likely they are to take on basic regulatory messages and implement structured approaches to food safety management.
- Financial constraints can impact on the degree to which the work environment is set up to optimise compliance. Lack of resources can also manifest in terms of access to training/information, staff time or capacity (the presence of sufficient staff to be able to perform necessary tasks).
- Particular types of smaller FBOs have been linked with a tendency to comply less; these include food takeaways, those whose staff receive very low pay and FBOs in areas where there is rapid 'churn' of businesses closing and opening.
- Independent outlets appear to face more barriers than those as part of a franchise or chain: relative to the latter the former lack access to financial resources and standardised food safety practices, and it has been argued that they do not have their wider reputation/financial liability at stake to the same extent.
- There is some evidence that personal characteristics of staff may affect compliance; factors such as their proficiency in English, their skills background and their employment status may impact on food safety behaviours.

- Recent evidence suggests that commercial interests can drive compliance in smaller as well as larger businesses. Findings emerging from the evaluation of the FHRS and FHIS are consistent with this.

3.1 Introduction

This chapter considers structural characteristics of organisations which can influence compliance and take-up of best practice. 'Fixed' organisational features such as business size and sector, turnover, and the demographic composition of staff have practical implications for business practices which can impact on compliance related decision-making.

The issues discussed below provide some context to subsequent chapters which focus more explicitly on cultures, attitudes and 'mindsets' which are arguably less fixed and potentially responsive to intervention.

3.2 Organisational characteristics

Diverse companies will often have to comply with the same (or overlapping sets of) regulations. However evidence suggests that their ease in doing so will vary to some extent as a consequence of size, customer base and supply chain position. These characteristics, in contrast to more psychosocial variables such as mindset or attitude, are relatively fixed in the sense that they are not amenable to training or marketing intervention.

3.2.1 Organisational size

With regard to size there are some particular issues to consider in the context of food safety (Wright et al 2012). The catering sector in the UK comprises 60% of all food businesses (Taylor, Assan, Green, Mccann, and Rodriguez, 2008, cited in Green and Kane, 2014) and primarily consists of small businesses, as defined by the European Commission[5]. Very small or 'micro' businesses employing less than ten employees, account for 87% of catering businesses (Food Standards Agency, 2003, cited in Green and Kane, 2014). Such businesses have their own particular culture and associated problems (Green and Kane, 2014).

There appears to be a broad consensus that SMEs are typically less compliant than larger firms. For example, among Environmental Health Officers (EHOs) it is generally agreed that the larger the business the more likely they are to take on

[5] The European Commission defines an SMEs as an organisation with fewer than 250 employees (broken down into medium enterprises with 50-249 employees, small enterprises with 10-49 staff and micro enterprises with fewer than ten staff). However, in some instances papers used alternative definitions, though SMEs will be defined as per the papers referenced.

basic regulatory messages and implement structured approaches to food safety management (Bukowski et al, 2012). Research carried out with FBOs indicates less commitment to safety in general in smaller firms. For example, a Portuguese study of food businesses found significant differences with respect to company size concerning (subjective judgement of) commitment of employees to hygiene and food safety issues. Employee commitment was significantly higher in the medium and large companies relative to micro businesses (Teixeira and Sampaio, 2013). However size alone does not always act as a useful predictor of compliance. For example the introduction of the national food hygiene rating schemes (FHRS and FHIS) has shown that a large proportion of small FBOs are independently able to achieve high ratings. An FSA study focusing on the views of enforcers found that clear lack of ownership for food safety could occur just as easily in small, medium and large food businesses (Bukowski et al, 2012).

Small businesses have nevertheless been mentioned as important locations in the transmission of foodborne illness (Walker et al., 2003, cited in Sampers et al. 2012). There is also a suggestion they are disproportionally affected when this occurs: a US business economics study showed that 'food-safety events' (ie foodborne illness outbreaks) associated with small-sized firms have a significantly more negative commercial impact than those associated with large-sized firms (Seo et al,, 2013). Small and medium enterprises (SMEs) can face more hurdles when implementing quality assurance standards and guidelines and maintaining their system (von Holy, 2004; Sugimura and Iizawa, 2003; cited in Sampers et al., 2012)

Larger firms are potentially better placed to undertake compliance processes more efficiently: medium and larger businesses (such as national chain retailers and manufacturers) often use a third party organisation to manage food safety management systems (FSMS) and ensure compliance with food hygiene and food standards legislation (Bukowski et al, 2012).

Independent outlets appear to face more barriers than those as part of a franchise or chain. It has been argued that because chain restaurants have more financial resources, standardised food safety practices, and a wider reputation/financial liability at stake, they are more likely to establish themselves as role models in the food service industry (Murphy et al., 2011). This is backed by findings that chain restaurants are more likely to have fewer violations than independent restaurants (eg Harrisa et al., 2014).

Trends with regard to compliance and company size appear to apply to health and safety compliance as well; across the EU small enterprises have higher accident rates compared with larger enterprises (Eurostat, 2007, cited in Arocena and Nunez, 2009) and there is evidence that Occupational Safety and Health (OSH) management systems tend to be of lower quality (Baldock et al., 2006, cited in Arocena and Nunez, 2009; Day, 2011).

3.2.2 Sub-sector and supply chain position

Within and beyond the food sector the regulatory burden for companies varies widely according to their main area of activity. Particular types of smaller FBOs

have been linked with a tendency to comply less, such as food takeaways, those whose staff receive very low pay and FBOs in areas where there is rapid 'churn' of businesses closing and opening, most commonly in urban areas (Bukowski et al, 2012). A large scale study to evaluate food safety knowledge among food handlers in British Columbia, Canada separated by place of employment revealed fast food and retail store workers scored significantly lower than workers at bars, workers in institutions and workers in family restaurants. Workers in processing operations also scored significantly lower than those in bars and institutions (McIntyre et al., 2013).

With regard to supply chain position, research has shown that safety violations, accidents, and product defects increase with outsourcing (eg Kochan et al., 1992, cited in Silbey 2009). UK and international literature concur on this issue with respect to a number of sectors. For example with respect to the safe use of chemicals in manufacturing, the importance of providing sub-contractors with the same on-the-job training (on hazard identification for example) as site-based workers has been emphasised (Niskanen, 2012). Literature focussing on hygiene in the health sector highlights this issue in the context of a hospital environment. Todd et al. (2010) have remarked that some individuals in this profession are extremely transient, have low occupational skills, and belong to the less advantaged educational and socioeconomic groups. Because their work is typically performed during off-hours under minimal supervision, contract cleaners can often escape regulatory control, health surveillance, and risk prevention oversight and must be therefore considered a risk factor for inadvertently spreading contamination through cross-contamination or lack of proper personal hygiene. Risks presented by outsourced cleaning are unlikely to affect small food establishments however. When employed directly by a food establishment (predominantly the case in the United Kingdom), cleaners tend to be permanent staff members who are trained specifically for sanitation roles, including basic food and hand hygiene (Todd et al., ibid).

In an HSE study of Respiratory Protective Equipment (RPE) use it was noted that small companies often looked to suppliers to tell them what to do, bearing in mind what was practicable and affordable (Bell et al., 2011. In small food businesses, however, compliance drivers are more likely to originate from the other direction, ie from consumers and clients: this type of driver is discussed more fully in Section 3.4.

3.3 Access to resources

Availability of resources is another relatively fixed aspect of operational context for FBOs. Resource limitations can manifest in terms of access to training/information, staff time or capacity (the presence of sufficient staff to be able to perform necessary tasks). Financial constraints can also impact on the degree to which the work environment is set up to optimise compliance.

3.3.1 Time and money

Time constraints are important to consider in gaining an understanding of why businesses do and do not comply. Lack of time, money and insufficient understanding of food safety issues have all been identified as barriers to food businesses drawing up an adequate Food Safety Management System (FSMS) (Bukowski et al, 2012). Within nursing, high workload has been negatively linked in compliance to hand hygiene regimes (Polat et al., 2011). An observation from an American study of FBO behaviour employing videotape analysis illustrates the type of dilemmas employees in a small business face vividly:

> '*Throughout the study it became apparent that finding time to practice good personal hygiene, while fulfilling other duties such as garbage clean-up, dishwashing and salad preparation was difficult. In one instance during a lunch service rush, there was not enough time available to practice proper handwashing between collecting potentially contaminated, garbage-bound packaging from raw ingredients and preparing salad. The executive chef and server-staff manager were both urging staff to complete the salad preparation quicker, and to not waste time by washing hands.*'
>
> Chapman et al., 2011, p.174

In a review of eleven studies of hand hygiene compliance in health care facilities between 1981 and 1999, compliance was almost universally low (Pittet, 2001, cited in Todd et al., 2010). Among the reasons given for poor compliance were interference with worker-patient relationship when patient needs were perceived as a priority, working in an intensive care unit, high work load and/or insufficient time.

Due to economies of scale the costs of compliance for SMEs can be substantially higher than in larger businesses, and the pay-offs may not be as great. Perceived as well as actual costs can be a deterrent to action. In a large survey of Portuguese food businesses, FSMS implementation costs were seen as a barrier to ISO 22000 certification (Teixeira and Sampaio 2013). The grounds for this view were not wholly unjustified: in terms of access to new markets after the implementation and certification, the authors concluded that the system was more beneficial for medium-sized companies than smaller companies.

Companies may be unwilling or unwilling to spend relatively small amounts to facilitate safety improvements. For example incentive programmes (ie schemes that reinforce positive behaviours through payment or some other reward) can be effective in motivating workers to work more safely but this may not be an option for small organisations or where finances are tight (York et al., 2009a, 2009b).

Availability of time and/or finance is also likely to impact on availability of training which is less likely to be available or encouraged in small businesses. In the US the National Restaurant Association reports that 12.7 million employees are employed in the restaurant industry (NRA, 2010, cited in Arendt et al., 2013, and the majority of those employees have not received food safety training.

3.3.2 Technical expertise

Having specialised technical staff in place to stay abreast of emerging food safety risks and conduct ongoing evaluations of procedures, supplier requirements and front-line staff practices is said to provide a necessary foundation for a good food safety culture; however this is less likely to be the case within SMEs (Powell et al., 2011. There is some evidence that smaller firms are less likely to seek free advice from statutory bodies. This appears to be the case outside as well as in the UK. In the context of the Turkish meat and poultry industry large firms are more likely to make use of support facilities provided by universities and regulatory agencies (Kok, 2009). Also, in Greece, large-scale table olive processing firms tend to employ well-qualified food and agricultural engineers and workers, while smaller enterprises suffer from a lack of qualified staff required to adopt such a system (Karipidis et al., 2009, cited in Tunalioglu et al., 2012).

In food safety a shortage of staff who understand HACCP can be a problem since 'effective implementation requires a team approach and an understanding of the rationale for monitoring procedures by all staff' (Tokuç et al., 2009). For example, in a Turkish food safety survey, almost half of dairy plant managers questioned felt that lack of knowledge about HACCP/FSMS was the main barrier to its implementation (Karaman, 2012). Food businesses in Greece who could identify the benefits of HACCP implementation as very important and fully understood possible problems scored better in HACCP evaluation results than those who did not (Milios et al., 2013). The author highlights the need for 'competent authorities, as well as certification bodies and consultants, to make more effort to persuade enterprises of the benefits of HACCP implementation'.

With regard to the UK, Mensah et al. (2011) have emphasised the necessity for employees involved in the development and implementation of a FSMS to be technically competent as most enterprises are tending to develop their food safety management systems in-house.

When attempting to implement a food safety programme, owners and senior managers in a Canadian food processing plant were impeded by not having someone on the premises who could champion it; there was no-one on site with appropriate technical knowledge of HACCP as well as previous experience specific to the production process. It has been suggested that problems like this can arise when companies are unable to offer competitive salaries. A smaller company that participated in the study could not locate someone who knew about HACCP and was willing to work for the wage it was willing to offer (Wilcock et al., 2011).

A study in the agricultural sector suggests the relationship between access to information and good practice may not be straightforward. For example increases in technical information among growers do not necessarily translate into performance of good agricultural practice (GAP) activities. Other influences, such as farm size and a desire to contribute to the safety of the produce supply, help motivate growers' decisions regarding their on-farm food safety practices (Tobin et al., 2013).

An examination of good practice in health and safety within SMEs found no influencers were as powerful as a dedicated internal health and safety managers with sector-specific health and safety knowledge (Alty, 2010). In some sectors smaller businesses are entirely reliant on external contractors for certain areas of compliance; for example, motor vehicle repair bodyshops tend to rely on external contractors/advisors to carry out technical testing and health surveillance (Broughton et al., 2010). Lack of expertise may result in a less strategic and educational approach to risk management: in a study examining management of noise exposure, smaller companies considered only a limited range of possible options (such as buying new machinery). There was also a tendency for these companies to become preoccupied with taking accurate noise measurements rather than focusing on implementing the right solutions (Bell and Webster, 2011).

3.3.3 Environment and equipment

Characteristics of the physical environment such as the provision of wash basins and necessary cleaning equipment play a large role in helping to set organisational expectation of behaviour and are therefore key to promoting a food safety culture in businesses. Research suggests that the food safety environment is said to have a marked effect upon compliant 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 in Griffith et al., 2010). Managers also need to ensure employees have access to necessary tools that are located in convenient areas in the kitchen (York et al., 2009a). At a basic level, food safety is potentially compromised if information at a more basic level is not provided in the work environment such as signs to remind employees of the serious consequences that can result from not complying with guidelines (York et al., 2009a).

Environmental features which have a bearing on ease of communication can affect how compliance is managed. For example employees within smaller FBOs will usually be working within a confined space; so communication difficulties that can be experienced in larger premises or in an outdoor environment are unlikely to be present. A study of compliance within the agriculture sector observed that work on farms is not generally conducted in teams, which makes maintaining communications between dispersed individuals critical for safety (BOMEL Ltd, 2009).

3.4 Commercial environment

Commercial concerns have been identified in the UK and further afield as drivers of compliant behaviour. The local and international trading environment can be relevant depending on the position businesses occupy in the food supply chain.

3.4.1 Competitiveness and business success

Although there tends to be better understanding of the link between compliance and business success in medium and large businesses it would appear

businesses of all sizes are increasingly conscious of the potential commercial benefits of exhibiting best practice and/or being seen to do so (Bukowski et al, 2012). Findings emerging from the evaluation of the Food Hygiene Rating Scheme (FHRS) and Food Hygiene Information Scheme (FHIS) are consistent with this. For example in Northern Ireland, EHOs were confident that levels of compliance have improved with the FHRS in Northern Ireland and this was attributed to FBOs seeing a business case for improving their food hygiene (Vegeris and Smeaton, 2013). Chapter 6 describes perceived impacts of the FHRS/FHIS in more detail.

Mensah and Julien (2011) investigated the perceived benefits of complying with food safety requirements in the UK Food and Drinks sector. Approximately 81 per cent of enterprises surveyed claimed that they were driven by the prospects of product safety improvement, 76 per cent were driven by customer requirements and 60 per cent were driven by regulatory requirements. The survey also revealed that 59 per cent of enterprises were driven by the expected marketing advantage that could be derived from implementing the standard, while others (54 per cent) saw the potential for improved corporate image and 38 per cent claimed that their certification was motivated by the fact that their competitors were certified. Only 35 per cent of enterprises complied because of a potential liability claim and 30 per cent were driven by the prospect of operational cost reductions.

Wright et al, (2007, cited in Wright et al, 2012) reported that among 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 measures, such as prosecution and being sued are lesser factors but still rated as between 'moderate' and' great' factors. Wright et al. propose a concept of business compliance with four key influential factors, these being:

- relationships, trust and confidence
- regulatory drivers and support
- business knowledge and resource
- and business incentives for voluntary improvement.

The fourth of these is seen as 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 (Wright et al, 2012). Businesses that promote food safety culture can market their activities to consumers at retail, who, in turn, can feedback to those companies that make food safety a public priority (Powell et al., 2011).

Further afield Milios et al. (2013) comments that Greek food businesses would benefit by developing a more conscious food safety policy, gaining market competitiveness. A Japanese study is somewhat critical of the impact commercial pressures can have on smaller businesses. It describes issues faced by small-scale producers when they do not meet safety standards, and advocates a system where buyers try to understand the constraints that producers face and also try to

reflect on their own relationship to the problems, rather than terminating contracts and enforcing standards at any cost (Kimura, 2012).

The desire to secure supplier relationships or repeat trade is arguably an area where drivers for FBOs differ from those within health settings and there is less potential for read-across between the two sectors. There tends to be an emphasis on ethics in the latter case; for example one view is that all staff are patient advocates and therefore have a moral obligation to be caring, compliant and, most importantly, effective when performing the global standard for hand hygiene (Mortell 2012).

In health and safety, drivers for compliance appear to be more varied; a potentially important difference is that many control measures are designed to protect workers themselves (as well as or instead of consumers). In an HSE study, a range of factors were found to influence decision making around use of respiratory protective equipment (RPE), largely falling under the banner of 'external guidance' received from sister companies, competitors, consultants, HSE guidance/website, manufacturers, suppliers, and industry contacts. Insurers were a key driver behind implementation of systems to record RPE issue and worker health through health surveillance, not always required by law (Bell et al., 2010).

3.4.2 EU Accession

Outside the EU the prospect of accession and associated trading opportunities this offers can act as a driver. In a study addressing economic obstacles to compliance Tunalioglu et al. (2012) highlighted the need for 'stricter regulations and precautions' within the country's olive processing firms. Access to the EU and other international competitive markets is regarded as a 'major incentive for adoption of food safety systems in the near future'. The authors reported that the application of ISO 22000 has been widely promoted in Turkey, especially as a tool to aid exports, but it is clear that the quality of ISO application will depend on the organisation involved in its setup and monitoring. Also it can be difficult however with the proliferation of new schemes, to find competent auditors (Kok, 2009). Cobanoglu (2012) verified the hypothesis that export orientation is a major motivator for the adoption of food safety systems in the Turkish dried fig industry: when firms are export-oriented, 'the probability that these firms will adopt food safety systems goes up by 40 per cent'.

A survey of dairy farmers, also in Turkey concluded that large facilities will more easily adapt to food safety management systems than family-run facilities. In the short and medium term, it is suggested that medium-sized facilities should organise themselves as unions or cooperatives to facilitate implementation of required systems (Demirbas et al., 2009). Similar advantages for larger firms were noted in a study of Turkish dairy and meat processing firms: businesses that employed more than twenty employees and those with a food engineer and/or veterinary employee were more likely to have successfully implemented adopt food safety management systems (Cobanoglu et al., 2011).

Overseas trade clearly matters to producers in the UK although this is not a focus of the literature in this review. Mensah and Julien (ibid) however note that 18 per

cent of the food and drink enterprises that they surveyed claimed to comply to avoid potential export barriers from overseas customers (and because it was an insurance requirement).

3.5 Staffing issues

3.5.1 Role and seniority

In a study at a veterinary care centre only 42 per cent of veterinary technicians (VT) reported washing their hands every time between patients, and most respondents believed they should have washed their hands more frequently. Only 53·per cent reported being educated by doctors regarding the importance of good HH practices. This was seen as failure among veterinarians and the veterinary technician educational system to emphasise the importance of HH in limiting the potential for nosocomial infections (Nakamura et al., 2012). Poor compliance among medical students has similarly been attributed to a lack of hand hygiene training during undergraduate medical education (Gluck et al., 2010).

3.5.2 Language and demographic issues

Many food businesses are managed by or employ minority ethnic people who may not speak English as a first language. The potential communication issues that can result from this have been identified as a possible factor to consider with respect to safety compliance.

In the FSA's process evaluation of the FHRS, there were isolated reports of ethnic takeaways whose staff struggled with English being 'resistant to change' or 'facing persistent obstacles' (Vegeris and Smeaton, 2013). A study of food safety knowledge among food handlers in Vienna, Austria showed that lower scores were significantly associated with language barriers (Pichler et al., 2014). Further afield, similar factors were negatively associated with food worker scores in a large-scale Canadian study of food handlers (McIntyre et al., 2013). In order to counter possible language issues many international food retailers require their suppliers to prominently display at all hand washing stations posters in all the dominant languages that describe appropriate hand washing steps for the workforce. Interventions to increase compliance with hand hygiene practices also must be appropriate for different cultural and social needs (Todd et al., 2010).

Cultural differences unrelated to language can have a positive effect upon food safety management. In the US it has been noted that collectivist cultures, such as those found in Mexico and other Latin American countries, tend to focus on the interests of a group, a family, or extended relationships rather than on individual interests (Santiago-Rivera, Arredondo, & Gallardo-Cooper, 2002, cited in Cho et al., 2013) and that this has a positive effect on adherence to proper food safety practices (Cho et al., 2013).

3.5.3 Other characteristics

A range of other worker characteristics may have implications for compliance. This includes prior education and formal qualifications in food preparation or catering. A study of Austrian food handlers showed that scores on a food safety test were significantly associated with education, previous participation in food safety training courses as well as training received within their current workplace. Younger food handlers scored lower that those who were older. Interesting those with a certificate 'Meisterprüfung', the highest Austrian degree of an apprenticeship scored more highly than handlers without, but not significantly so (Pichler et al., 2014).

Aspects of lifestyle may also come into play. A study of HH behaviour among caregivers in child day care centres (DCCs) demonstrated that a personal characteristic, namely having children living at home, was associated with HH compliance (Zomer et al., 2013). Regarding handwashing, among a sample of food handlers across multiple US states significant differences were noted between full-time and part-time employees, management positions, and those who had additional training. Responses to the question of washing their hands after returning from a break showed significant differences between full-time and part-time status. It was suggested that part-time employees fail to follow this practice because it is not their career of choice or because they are unconcerned about following the strict standards and rules of the job description (Ghezzi and Avoun, 2013). Pittet (2001, cited in Todd et al., 2010) found low hand hygiene compliance was associated (alongside time pressures) with forgetfulness, lack of knowledge of the guidelines and/or protocols or disagreement with them, being male, being a physician rather than a nurse, lack of good role models, and lack of administrative sanction of noncompliers or rewards for compliers.

Finally, paying staff a fair wage may encourage employees to improve all aspects of their work performance including food safety. This is not explicitly addressed as a factor in the reviewed literature but a recent study focussing on UK enforcement professionals reported an observation linking this with poor 'ownership' of food safety.

> '*Some FBOs think it's easy to employ people with low skills and pay them low wages but all they get is staff who have no ownership [of food safety].*'
>
> Environmental Health Enforcement officer, Metropolitan Borough Council (Bukowski et al., 2012)

The issue of ownership of food safety and its role in compliance is explored further in Chapter 5 which addresses organisational culture.

4 Behaviour and modes of communication within organisations

Chapter summary

- The role of managers and supervisors in encouraging and motivating employees to follow proper practices is critical.
- This includes indirect as well as direct influences: employees will pay attention to the actions of managers as well as instructions they are given more explicitly, and 'role modelling' desirable behaviours is therefore important.
- Worker participation or 'worker involvement' in health and safety continues to be strongly advocated in recent literature. This supports shared responsibility within workplaces, potentially enabling workers to raise the alarm about safety risks or management flaws that would otherwise go unchecked.
- An unwillingness to 'speak out' can result from practices where employees who have made mistakes are named and shamed.
- In the absence of formal training, workers depend on their managers and colleagues to communicate information about compliance to them in a manner that is understandable and persuasive.
- Addressing language barriers is critical. Use of graphics and supplementary materials is advocated with non-English speaking workers who may not have fully understood the original training content.
- Positive changes in behaviour are not easily achieved and consideration must be given to motivation, constraints, barriers, and cultural factors that mediate them.

Having considered structural characteristics of dutyholding organisations in the previous chapter, this chapter addresses the activities that take place within organisations. The evidence reported here focuses on communications and behaviours that serve to support or potentially compromise compliance with regulations.

4.1 Behaviours within organisations

There is consensus in the literature that the behaviours and communication styles of those in leadership roles are of particular importance in influencing compliant behaviours. This includes indirect as well as direct influences since it is generally accepted that employees will pay attention to the actions of managers as well as instructions they are given more explicitly.

4.1.1 Setting an example to junior workers

Within the context of food safety, the introduction of new, safer processes is unlikely to be successful unless managers demonstrably lead the way. For example there is a strong positive association between ability of managers to describe hand washing and the ability of workers to demonstrate code-compliant hand washing (Allwood et al. 2004, cited in Todd et al., 2010). It can be difficult for senior staff to drop habits they may have become accustomed to over a long period and consequently there may be resistance to change (Teixeira and Sampaio 2013) In a qualitative study of managers based in the Canadian food manufacturing sector, long-term production supervisors admitted that creating new habits was a challenge, and that they had to constantly remind themselves to set a good example for production workers (Wilcock et al., 2011).

In the US, where the majority of employees in the restaurant industry have not received food safety training (National Restaurant Association, 2010, cited in Arendt et al., 2013), the role of managers and supervisors to encourage and motivate employees to follow proper practices is critical. The manager plays a key role in the food safety culture by establishing policies and standards, expecting accountability, serving as a role model, controlling rewards and punishment, providing training, and providing needed resources to follow food safety practices (Arendt Paez and Strohbehn, 2013).

Research on health and safety compliance also points to the importance of leading by example. The wearing of RPE by supervisory staff can be instrumental in the willingness of workers to don equipment that may be viewed as too uncomfortable or inconvenient to bother with (Graveling et al., 2009).

In a study of health and safety compliance in medium-sized organisations, there was a view among duty holders that overall company and managerial attitude towards health was very important: where managers would not engage with employee health issues, duty holders found it very difficult to engage staff and vice versa (Thompson and Ellis, 2011).

The importance of positive role models has received attention in the context of hospital hygiene, for example in a Swedish study where medically registered nurses (MRNs) were seen as having a key role in upholding sufficient hygiene in community nursing care by presenting as positive role models and showing interest in hygiene work (Lindh et al., 2012). Findings from an observational study conducted in a French teaching hospital identified job seniority as an independent predictor of hand hygiene compliance, prompting the authors to highlight the

potential for senior health care workers to act as role models for more junior staff (Buffet-Bataillon et al., 2010).

Referring to international medical practice, Mortell (2012) observed that 'employees have all seen educated and knowledgeable clinicians fail to practice their organisation's hand hygiene recommendations'. In UK hospital setting literature there is some evidence that job role can make a difference. For example, compliance by doctors with regard to more than 600 hand hygiene opportunities available to HCWs was 47 per cent, nurses 75 per cent, ancillary nurses and other staff 59 per cent and allied health professionals 78 per cent (Randle et al., 2010). Mortell (2012) also noted differences according to rank/profession: reporting that nurses seen to be more compliant at above 85 per cent, compared with below 60 per cent for other medical staff.

4.1.2 Worker involvement

Top down influences can play a major role in shaping the attitudes of more junior staff, but 'bottom up' communication can also be a vital influence. In a Canadian study examining implementation of food safety initiatives, involving employees in developing the programme was cited by food safety managers/coordinators as vital to successful HACCP implementation (Wilcock et al., 2011).

As documented in the 2010 review, worker participation or 'worker involvement' is strongly advocated in the health and safety literature although the reviewed evidence does not explicitly link this with improved compliance. Some sources suggest that the involvement of worker representatives in health and safety can significantly contribute to the safety culture of a workplace and suggest that this in turn can lead to improved health and safety. For example, an HSE study involving large businesses from a range of sectors (including the food industry) emphasises the importance of involving workers and their representatives in decisions about control measures (Buchanan and Robertson, 2009) while another reports on a worker involvement initiative that led to a range of business benefits, such as a reduced occurrence of workplace accidents, reductions in absence due to workplace accidents and illnesses and increased employee engagement with health and safety (Broughton, Wilson and Newton 2013). As an illustration of what can happen when workers are not involved, one investigation cites an organisation where employees choose not to use hearing protection as a result of feeling it had been imposed without consultation (Brueck, 2009).

More generally, an environment of co-operation and communication between managers and employees supports a culture of shared responsibility within workplaces, where there is increased potential for workers to raise the alarm about safety risks or management flaws that would otherwise go unchecked. A positive example of this aspect of culture was demonstrated in the construction of the London Olympic park where a work environment was actively fostered in which workers were empowered to stop work if they felt unsafe (Lucy et al., 2011; Healey and Sugden, 2012). On the other hand, an unwillingness to 'speak out' can be mediated by blame culture where employees who have made mistakes are named and shamed. 'Error management systems' can potentially undermine a positive

safety culture because they appear to foster a culture where individuals are used as scapegoats and faulty management systems are left to pass uncorrected (Reason et al., 2001, cited in Griffith et al, 2010).

A collection of HSE case studies conducted across a range of industries suggested that poor communication between 'shopfloor' and senior staff can be attributed to 'good news' syndrome in which senior managers made it plain that they do not want to hear about problems – just progress. The author suggests that organisations and individuals seeking to improve their management of these issues need to examine their cultural values as well as their systems; one question which was suggested for assisting in making improvements was "what do you do when you see a potential problem?". This issue underlies many of the difficulties which adversely affect efforts to improve in-company and inter-company communication and cooperation; if people feel that raising a concern is not acceptable, they may well 'keep quiet' (Gilbertson et al., 2011).

A climate in which employees are able to raise concerns about workload and time pressures that may be causing compliance difficulties is also important. In a study which examined worker compliance with standard operating procedures (SOPs), an organisational culture where staff feel able to challenge management pressure was reported to be an important factor in achieving compliance (Bates and Holroyd, 2012). However an HSE study of attitudes among company directors showed that while many felt they consulted their workers and took their views on board, many were passive in obtaining feedback, said to be exemplified by the response 'my door is always open' (King et al., 2010). An extreme example of what can happen when 'bottom up' communication is not encouraged was arguably demonstrated by food safety incident at the US Peanut Corporation of America (linked to an outbreak of Salmonella Typhimurium in 2009): employees reportedly said the facility was 'a dump', but did not report their concerns to officials before people became ill and died (Sharp, 2009, cited in Powell et al. 2013).

4.1.3 Being observed

The sense that work activities are being watched by others, such as by members of the public, colleagues or managers can be an important driver for adherence to regulations.

There is a particular focus on this topic within the hospital hand hygiene (HH) literature. In a UK study to explore this issue the majority of health care workers surveyed said that the incidence of hospital acquired infections (HAI) could be reduced to a greater or lesser degree if patients asked whether their health care worker (HCW) had cleaned his/her hands before touching them. Two-thirds felt that hand hygiene would improve as a result. The authors concluded that involving patients in the design and promotion of hand hygiene at the institutional level is very promising and should be considered as part of the organisational safety culture, while acknowledging that some staff feared that it would create tension between HCWs and patients (Pittet et al., 2011). An influence on HH identified in Australia is that of social change in community perceptions of hand hygiene and

the acceptance of alcohol-based hand rubs (AHR) in daily living activities (noted through recent advertising in the general media of AHR products available in supermarkets for everyday use). It is anticipated that this will assist in improving compliance with hand hygiene practices (among staff as well as visitors) in hospitals (Pantle et al., 2009).

In an interview study, Canadian public health inspectors stated that lack of handwashing by food handlers is 'one of the biggest complaints that comes from the public'. Another participant commented that: 'one of the biggest things I find with handwashing is they don't do it properly'. While most participants agreed that inadequate handwashing was a key issue, some participants had different experiences with the issue with regard to food business inspections. Some participants discussed instances of food handlers not washing their hands even in their presence and having to tell the food handlers that they forgot to wash their hands while others stated that handwashing was not often addressed during inspections because food handlers tend to be more diligent with washing their hands in the presence of an inspector (Pham et al., 2010).

Within the health and safety literature it has been suggested that workers should report observations of health and safety violations made by other workers. With respect to the prevention of accidents in the construction industry, Bouder and Lofstedt suggested that the option of confidential reporting mechanisms should be explored (2010). However enhanced in-house surveillance and internal 'whistle-blowing' is by no means universally recommended. Indeed, positive safety culture has been characterised as one that leads to increased safety by fostering, an efficient and reliable workforce sensitized to safety issues 'with minimal surveillance' (Silbey 2009).

4.2 Communicating about compliance

The ability of staff to comply with legislation is naturally related to the extent to which they understand the requirements that the legislation places on them. In the absence of formal training, workers depend on their managers and colleagues to communicate this to them in a manner that is understandable and persuasive. The research literature is unequivocal regarding the importance of ensuring instructions issued to staff use clear definitions and show a clear understanding of their role.

An Interview study focussing on the experiences of Canadian food safety inspectors illustrates the potential consequences of poor understanding among FBO workers (Pham et al., 2010). Notably there was a basic lack of comprehension among food handlers about the proper temperatures for maintaining food resulted in time-temperature abuse:

> *'[Employees say] why does it have to be 4 degrees? They don't understand.'*
>
> Canadian food safety enforcer, Pham et al., 2010

A study of communication between food safety managers/coordinators and production workers, also in Canada underlined the need to fully explain the

importance of the food safety management programmes to workers, ie to link the benefits of the programme to the procedures workers must follow, to listen to workers' challenges regarding compliance with procedures, as well as continually work to improve the programme using workers' suggestions (Wilcock et al., 2011). Participants also felt that ramifications of non-compliance for the business should be explained to employees in hard terms.

The hand hygiene literature stresses the necessity of using precise language in written instructions. For example, the phrase 'after environmental contact' is interpreted less straightforwardly than 'after patient contact', among nursing staff whose work flow often requires touching an instrument (eg, silencing a monitor alarm) immediately before touching the patient (Song et al., 2013).

Addressing language barriers is critical. Wilcock et al. (2011) cite the successful application of graphics with non-English speaking production employees to increase workers' understanding of a new food safety programme. Production workers who participated in the study highlighted the need to engage in additional communication with non-English speaking workers who may not have fully understood the original training materials.

> '*It was the training because at that time my English was a lot poorer than what it is now and I had to be training people with my English. The good thing is that because we are kind of multicultural, we have people in production in the plant with the same issue in terms of language so we understand each other very well and the training in the end was effective.*'
>
> Production worker, Wilcock et al., ibid

An HSE investigation focussing on the construction industry reported that, in the most part, those in the industry hear of incidents through the trade press or on the grapevine which inevitably fails to convey fully and accurately the detail or the key lessons to be learned. This impedes those who work in the construction industry from learning from the experiences of the industry as a whole both in the UK and around the world (Gilbertson et al., 2011).

While the literature under review contains some useful insights on the role of within-organisation communication in encouraging compliant behaviour, there is acknowledgement that behavioural change is not easily achieved and consideration must be given to motivation, constraints, barriers, and cultural aspects (Soon et al., 2012). The next two chapters consider these complex psychosocial factors in more detail.

5 Safety culture within dutyholding organisations

Chapter summary

- Safety culture concerns groups of people (not individuals alone) within a business, how they interact, what an organisation is about and how they behave. A positive safety culture is important in reducing non-compliant behaviour.
- There are multiple definitions of safety culture so it can be difficult to draw generalisations from relevant literature. Many studies discuss phenomena suggestive of a positive safety culture without using the term explicitly, adding to this difficulty.
- A value system that prioritises avoidance of harm appears is an important feature. Informed perceptions of and attitudes towards risk are also key.
- Staff at all levels, managers in particular, have a role to play in creating and maintaining a positive food safety culture. Practical elements include ensuring that effective risk management systems are in place, and that these are communicated clearly to all staff.
- A culture of compliance is not possible when dutyholders do not perceive that adherence to particular regulations as either necessary or desirable within their own company. This can result in a reluctance to learn about compliance in the first instance and ultimately, non-compliance.
- Management commitment is a recurring theme in the international literature on safety and hygiene compliance. Another important attitudinal factor is a sense of taking 'ownership' for food safety.
- The inclusion of 'confidence in management' (CIM) as an official risk category has been welcomed by food safety inspectors for the opportunity it allows to look beyond the most evident displays of compliance towards a better indicator of a compliant mindset and an ability to sustain compliant behaviour. Attitudes towards risk have a major influence on compliance; if the potential consequences of foodborne hazards are not viewed as disastrous this can lead to difficulties in engaging staff on the importance of food safety.

- Regarding hand hygiene specifically, problems with risk perception pervade the health care sector at all levels and the relationship between risk of cross-infection and staff compliance with hygiene procedures is complex. This presents a challenge for achieving hand hygiene compliance in hospital environments.
- Typologies classifying FBOs can be helpful, not just in terms of describing compliant behaviours but they also have the potential to be of practical use in assessing safety culture and guiding enforcement activities; it has been noted that a 'passive' mindset is one of the most problematic to deal with.
- Recent evidence suggests that commercial interests can drive compliance in smaller as well as larger businesses. Findings emerging from the evaluation of the l Food Hygiene Rating Scheme and Food Hygiene Information Scheme (FHRS/FHIS) are consistent with this.
- Cost, time constraints and apathy can present barriers to compliance. These may be compounded by perceptions that compliance is burdensome or that an inspection system is unfair.
- There is a suggestion that surveillance can drive up compliance but this may not be practical or desirable in all working environments.
- Determining barriers and negative attitudes is an essential step in developing interventions to improve compliance.

This chapter examines the role of organisational culture in promoting compliant behaviours, and motivations to comply. This is an important area to consider as the Pennington Inquiry concluded that the culture at the butchers premises where the South Wales outbreak originated was 'one of little regard for the importance of food safety but where making and saving money was the priority' and was instrumental to the circumstances that led to the outbreak (Griffith, 2010).

The chapter starts with a discussion of what is meant by a safety culture and then moves on to discuss underlying attitudes and beliefs (ie cultural factors) that can influence compliance. This is followed by a description of typologies that have been used to categorise dutyholder behaviour. The chapter concludes with a discussion of studies that signal the need to address structural and behavioural factors as well as cultural factors when addressing compliance.

5.1 Safety culture

Organisational culture concerns groups of people (not individuals alone) within a business, how they interact, what an organisation is about and how they behave. Studies indicate that whilst some aspects of workplace behaviour relate to the individual a significant portion may be related to the prevailing culture. The concept of workplace culture affecting employee behaviour, whilst 'largely ignored' in the food industry, has been studied in a number of other sectors, including aviation, and the nuclear industry (Griffith et al., 2010b).

Definitions of safety culture in the context of food safety can vary although the same basic ideas appear to feature in each. A representative example is the definition provided in the Pennington Inquiry report (Pennington, 2009):

> '*A manifestation of the values and beliefs and attitudes within a workforce. Its formation is dependent upon the knowledge, standards, motivation and leadership of the person in charge, how they communicate with, and are trusted by, the staff.'*
>
> (Pennington 2009, p.85)

Food safety culture can be a seen as a component of a wider organisational culture: for example, Yiannas (2009, cited in Griffith et al., 2010a) defined it as 'the way in which an organisation or group approaches food safety, in thought and in behaviour, and is a component of a larger organisational culture'. In practical terms, according to Powell, Jacob et al., (2011), individuals within an organisation with a good food safety culture:

- know the risks associated with the foods they handle and how those should be managed;
- dedicate resources to evaluating supplier practices;
- stay up-to-date on emerging food safety issues;
- foster a value system within the organisation that focuses on avoiding illnesses;
- communicate compelling and relevant messages regarding 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 end consumers) when illnesses are linked to their products.

A comprehensive review of hand hygiene compliance in the health care and food industries concluded that the food safety culture within a business may be the most important factor for determining whether that business can avoid violations on inspection, foodborne illness among its patrons, or costly recall of its products. The more confident the business is in the production and/or service of its food, the more likely it will implement proper hygienic measures and institute effective training of the staff, both managers and other employees (Todd et al., 2010).

Definitions used with respect to health and safety compliance do not differ markedly from those used in relation to food safety. For example, HSE (2009) have defined 'good' organisational safety culture as one where there are 'shared, accurate perceptions of risks and everyone adopts the same positive attitudes to health and safety'. Griffith et al. (ibid) examined the literature on health and safety culture and organisational 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, the authors 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’. A total of six indicators were identified to be appropriate for use in assessing food safety culture and performance:

- food safety management systems, style and processes;
- food safety leadership;
- food safety communication;
- food safety commitment;
- food safety environment;
- and risk perception.

The FSA’s own research has indicated that the best indicator of FBO disinterest in compliance is a lack of clear ownership for food safety. In a large qualitative study, comments from enforcement staff were suggestive that this could occur just as easily in small, medium and large food businesses (Bukowski et al, 2012). Manager commitment to, and ownership and prioritisation of food safety feature strongly in an analysis undertaken by Wright et al (2012) who concluded that food safety culture can be said to have the following elements:

- Priorities and attitudes – Food business‘s attitudes towards food safety and the degree to which food safety is prioritised within the organisation;
- 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);
- Confidence in food safety systems - the extent to which the business perceives the food hygiene regulations to be valid and effective;
- 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;
- Competence - Knowledge and understanding of the risks and subsequent risk management throughout the organisation;
- Leadership – The extent to which there is clear and visible commitment and leadership of food safety from management;
- Employee involvement - The extent to which there is involvement, ownership and accountability for food safety across staff at all levels of the business;
- Communications - The extent to which there is open communication and freedom to challenge and discuss practices.

It should be noted that behavioural elements of the above list such as leadership, employee involvement and staff communications were discussed in the previous

chapter. The remainder of this chapter addresses attitudes and perceptions underlying safety culture.

5.2 Attitudes and perceptions

The definition provided by the Pennington Inquiry highlights the role of psychological factors such as attitudes and perceptions in driving both organisational culture and behaviours. This underlines how compliance is governed by a number of variables as well as the law itself, including attitudes towards regulation and those who enforce it.

5.2.1 Attitudes to compliance

Fairness or legitimacy (the extent to which workers view regulations positively or agree with them) is a particularly important concept in explaining compliance and procedural justice is important for nurturing compliance when people question the legitimacy of the laws they are requested to uphold (Murphy et al., 2009). Procedural justice is inherently intertwined with people's moral and ethical values (Leventhal, 1980, cited in Murphy et al., 2009). A culture of compliance is not possible when dutyholders do not perceive that adherence to particular regulations as either necessary or desirable within their own company. This can manifest in a reluctance to learn about compliance in the first instance, and a lack of cooperation with activities intended to provide a foundation basis for compliance.

A recent Finnish study suggested that complaints about the cost of complying may be linked to skewed beliefs about complying and/or negative experiences of inspections. Managers' views on compliance were investigated by questionnaire covering a range of food sectors. Opinion on whether correction of non-compliances had been economically difficult also varied significantly between groups; nearly half of all slaughterhouses responded most that they faced economic difficulties 'always or often'. Interestingly the opinion that correction of the non-compliances was economically difficult correlated significantly with the opinion that the inspector was not familiar with the production processes, and the view that they had not been given adequate guidance in implementing the legislation. Where FBOs stated that correction of the non-compliances was economically difficult, there was also a tendency for them to respond that the actions taken to correct non-compliances had complicated the production processes and that the deadlines to implement corrections had been too short (Mari et al., 2013).

The views of uncooperative staff can provide useful insights into attitudes underlying non-compliance. Among US growers who did not participate in training activities that were offered as part of a good agricultural practice (GAP) intervention, 43 of 50 non-participants indicated in an open-ended questionnaire item that doing so simply was not necessary. A sample of their responses is shown in the box below. Some responders indicated that they were the best judge of what was needed in their own company while others felt that compliance was too expensive or took up too much time. The author sets this in the context of 'inconsistent requirements among supermarkets and unspecified government

regulations' that result in uncertainty pervading the issues of on-farm food safety' (Tobin et al., 2013).

Examples of responses from agriculture workers regarding compliance-related training offer

'*Don't yet see the need. My customers don't demand it.*'

'*The scale of the farm operation does not warrant it.*'

'*We don't qualify because our sales are way below the requirement.*'

'*Don't feel it is necessary at this time. Our quality control standards are pretty good.*'

'*During my daily work on the farm I know what needs [to be] done pretty well, no need for a paper self-audit. Less paperwork equals a better life.*'

'*I probably won't unless it is mandatory because I don't have the time to [do] the lengthy process.*'

'*Feels daunting and unclear. Don't have time to put much time/resources toward it.*'

'*Need a clear and concise step by step manual to follow - or at least that would make it more approachable.*'

(Tobin et al., 2013)

A survey of dairy producers in Canada showed that only one-third of producers were interested in learning about food safety through educational courses. This was viewed by the authors as concerning, given that producers who had taken an educational course in dairy-health management were more likely to have precautionary attitudes towards the consumption of unpasteurized milk and be concerned about the impacts of antimicrobial resistance (AMR) in the dairy industry (Young et al., 2009).

One expert view is that the hospitality and food industries in the UK need to demonstrate, especially to small businesses, that learning cultures benefit both employers and employees. There may be issues in translating messages about this into language that managers of smaller FBOs can relate to.

> '*Food safety professionals are indeed discussing [food safety culture] already, but their knowledge is still not in a format that can be readily accessed and effectively utilised by small food business managers and owners. This is something that should be worked on in the future.*'
>
> (Macauslan, 2013, p.305)

Negative attitudes towards implementation of good practice can result from a reluctance to change old habits and adopt practices that may be more taxing. Among Portuguese FBOs the most commonly cited difficulty/drawback of ISO 22000 was 'internal resistance to change' (Teixeira and Sampaio, 2013). When Turkish dairy plant managers were asked what top management needed to do to

improve food safety practices in their plants, more than half disagreed that a HACCP-based food safety management system was necessary (Karaman et al., 2012).

It should not be assumed that there is a straightforward relationship between organisation type and attitude at employee level: apathy towards food safety can be present among workers in organisations that are (a) large and (b) broadly compliant. For example, a qualitative study conducted for the FSA reported an EHO's view that some staff working on shop floors of large supermarket chains and local store managers appeared to be 'disinterested' in food safety. This challenges the assumption that attitudinal problems are specific to smaller FBOs, and suggests that having formal food safety management systems (FSMS) in place and a certain amount of engagement from top level management is no guarantee of a positive culture across the organisation more widely. However the same study reported a tendency for smaller and/or less experienced businesses to see food safety as a second priority for their business. There was a perception that, to many businesses, 'food safety compliance' was viewed as legal terminology and grouped together with other (potentially burdensome) areas of government regulation such as fire, health and safety, building and even the UK immigration service. Even where finances were not a barrier, Authorised Officers (AOs) admitted that it was quite rare for FBOs and their staff to see compliance as an essential part of their job, rarer still for them to see it as an ingredient for business success (Bukowski et al, 2012).

5.2.2 Attitude towards the regulator

Evidence presented in IES's previous review of this area showed that perceptions of, and attitudes towards, regulatory bodies are also important considerations in understanding compliance (Wilson et al 2010b). Some recent findings in this area have come from work commissioned by the FSA to evaluate the national FHRS and FHIS schemes; the perspective of poor performing food businesses in particular help shed light on their attitudes that result in non-compliance. Proprietors expressed frustration with the inspection system and perceived unfairness about the rationale for poor ratings/inspection results. There was a view that the 'confidence in management' scoring category was too paperwork driven and a burden on small independent businesses; communications with local authority officers could be more collaborative and supportive as business staff felt vulnerable (Vegeris and Smeaton, 2014).

One of the key challenges AOs reported in their dealing with some food businesses was getting them to adopt the same sense of duty to public protection that they themselves had. Some clearly saw the actions of inspectors as a threat to their business.

> '*I'm trying to earn a living… he (the EHO) needs to understand that.*'
>
> Owner of local bakery chain, (Bukowski et al, 2012, p.27)

Issues can arise when enforcement professionals are seen as insufficiently knowledgeable. A Canadian study showed that food producers rated veterinarians

as very knowledgeable about on-farm food-safety (OFFS) and that they were also a favoured source of information about food safety. In contrast, only a minority of producers indicated that consumers and government personnel were knowledgeable about OFFS. It was concluded that veterinarians should have an important role in the continuing education of producers, because they are seen as a knowledgeable and trusted source of information about food safety (Young et al., 20109. Similar sentiments were expressed by farming managers in an HSE study with regard to a lack of specialist agricultural inspectors, potentially resulting in 'loss of credibility and effectiveness in an industry where shared expertise has a significant sway' (BOMEL LTD, 2009).

5.2.3 Perception of risk

Attitudes towards risk have a major influence on compliance and, due to its complexity, risk perception is regarded as an area of study in its own right. Knowledge about risks is a key determinant of risk perception and is therefore a consideration when understanding the potential causes of non-compliance. Mearns et al. (2010, cited in Niskanen 2012) comment that irrespective of whether workers perceive that their organisation is committed to their well-being, they will choose to obey safety rules based on their own appraisal of the risk situation.

An HSE survey of construction industry stakeholders suggests that individuals and organisations are conditioned by their experiences and what they see going on around them. This has a significant effect upon perception of low-likelihood events, as people will not have experienced them first-hand and may not even have heard about them from others. It has been suggested during consultation that some of those who work on sites are 'risk tolerant'; this research suggests that on the contrary, they just do not appreciate the hazards, possibly because there is frequently an element of 'making do' in site work. In a similar manner, directors and senior managers may not appreciate the potential impact of catastrophic events (Gilbertson et al., 2011).

Lack of compliance is due not only to time constraints, staff shortages, and poorly designed facilities but also to a sense of overconfidence among managers and owners because they see their operations as low risk (Coleman and Roberts 2005; cited in Todd et al., 2010,). According to Silbey (2009), *'dangers that are neither spectacular, sudden, nor disastrous or that do not resonate with symbolic fears, can remain ignored and unattended, and as a consequence are not interpreted or responded to as safety hazards'* (Silbey, 2009, p.357). Therefore if the potential consequences of foodborne hazards are not viewed as 'disastrous' this could lead to difficulties in engaging staff on the importance of food safety.

Risk perception issues appear to be common to food companies of all types but there is a suggestion in the literature that this may be a significant problem in smaller FBOs. A survey of more than one hundred Finnish FBO respondents found effects based on company size; when evaluating the food safety risk associated with their function, the bigger the FBO, the more clearly it seemed to perceive the food safety risks associated with its function (Mari et al., 2013).

Problems with risk perception have been described as pervasive in the health sector and (as demonstrated in section 3.5 of this report) health care staff at all levels have been observed to act in a way that suggest an underestimation of risk. In a German intensive care environment compliance rates calculated from direct observation of disinfectant use were generally poor and particularly so before aseptic tasks and before patient contact (Scheithauer et al., 2009). An Australian study reports frequent requests, particularly from senior medical staff, for evidence of the effectiveness of hand hygiene practices. Project staff and clinical champions reported resistance on the part of certain clinicians to following hand hygiene recommendations, based on their perception of a lack of evidence for the intervention. This phenomenon was encountered at all levels and in all areas of the health care system, despite high-level support and endorsement of the campaign by the professional medical colleges and the NSW Medical Board (Pantle et al., 2009).

The relationship between patient susceptibility to infection and compliance with hygiene procedures is not straightforward and in some circumstances staff are prompted to comply by a greater perceived risk: in a German study of hand hygiene awareness in healthcare workers for children, healthcare workers' compliance with hand hygiene recommendations was significantly higher in children with viral gastroenteritis compared to those without. Physicians in particular seemed to adjust their behaviour to the situation (although the lack of effect observed in nurses was attributed to better baseline hygiene behaviour) (Scheithauer et al., 2011). The authors suggested that awareness of transmissible diseases should be addressed more clearly in future research in order to implement this knowledge in training and education.

Fine-grained observation of behaviour is often necessary to specify the circumstances in which workers are less likely to adhere. An Italian study showed lower compliance for the moments temporarily following direct or indirect contact with the patients and generally limited comprehension among therapist of the risks of spreading multidrug-resistant bacteria through manual contact (Rossini et al., 2013). In a UK ward-based study, compliance varied according to type of contact varying from 50 per cent after contact with patient surroundings to 100 per cent before undertaking an aseptic task (procedure in which added precautions are used to prevent contamination of a person, object, or area by microorganisms) (Randle et al., 2010).

A study of hand hygiene (HH) behaviour among caregivers in child day care centres (DCCs) showed positive HH to be associated with the following sociocognitive determinants: knowledge and awareness of HH guidelines, caregivers' own perceived ability to perform HH when needed (ie, perceived behavioural control), perceived importance of performing HH, and habit (Zomer et al., 2013).

It is important to be aware that attitudes to risk can be changed. For example interventions which remind employees to perform behaviours and inform them of the serious consequences that can result from not complying with guidelines can be successful (eg, York et al., 2009b). Because risks are so specific to particular activities within different types of FBOs, risk communication needs to be tailored

so that is appropriate and relevant to particular types of workers. Chapter 7, which deals with interventions, addresses this issue in more detail.

5.2.4 Management commitment

Management commitment is a recurring theme in the international literature on safety and hygiene compliance. In a Canadian study looking at the implementation of food safety initiatives the most important factor reported by all levels of personnel interviewed was the commitment of the senior management to the programme. (Wilcock et al., 2011). A study of Greek food businesses also emphasised the need for management commitment to food safety policies which is viewed as 'essential for a proper HACCP implementation even in a sector where strict and thorough legislation is applied' (Milios et al., 2013, p.1394). DeJoy et al. (2010, cited in Niskanen, 2012) indicated that when managers and supervisors demonstrate their commitment to and support of safety, workers will reciprocate by making greater efforts to follow safe work practices and other safety-related recommendations).

A qualitative study for the FSA (Bukowski et al, 2012) analysed the views of local authority enforcement staff (referred to as authorised officers or AOs and Enforcement Managers or EMs in this context). It found that they made a subtle distinction between basic definitions of a broadly compliant business and the more complex but important concept of compliance as an 'attitude' or a 'mindset'. It was noted that compliance as a mindset was far harder to put into words.

> 'Compliance is a mindset, an attitude…I can't put my finger on it but you get a feel for it from talking to staff, walking around the business*.'*
>
> Food Safety Manager (Bukowski et al, 2012, p.23)

Among their comments on new guidance, the use of an official risk category dedicated to confidence in (FBO) management was praised by many AOs for the opportunity it gave them to look beyond the most evident displays of compliance towards something that they felt was a better indication of a compliant mindset and an ability to sustain compliant behaviour. The emphasis on detecting a compliant attitude meant, effectively, that an FBO's 'confidence in management' (CIM) score was considered the crucial factor in predicting future compliance (Bukowski et al, ibid).

5.3 Typologies based on attitudes towards compliance

Research findings about attitudes and perceptions around compliance have been used to characterise dutyholders according to type, each linked to their propensity to comply. In a report for Defra (Pike, 2008, 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 when deciding on interventions'* (p.21, cited in Wright et al. 2012, p.4).

An analysis conducted as part of a study for the FSA on FBOs and enforcers' attitudes to compliance suggested that the following broad types of dutyholder could be distinguished within the sector (Bukowski et al, 2012). These are reproduced in detail below as they describe the type of behavioural and cultural factors of central interest to the current review.

Proactive: FBOs who displayed both the will to comply and clear ownership of food safety issues. These scored highly on 'confidence in management' demonstrating recognition of risk and implementation of appropriate controls which in turn reassured AOs that standards were likely to be sustained. This was evident in some businesses who made it their job to self-educate, comply and, where needed, contact the regulator for advice and guidance if they were unsure.

Reactive: these types of FBO were considered the most commonplace, with FBOs taking some positive steps towards ownership of risk and compliance while still relying on AOs for guidance to move them in the right direction. Their willingness to comply was evident both in the verbal exchanges they had with the AO (the questions they asked) and their overall demeanour (the way they voluntarily showed an AO around their business and talked them through paperwork), as well as in their general approach to FSMS, the upkeep of their paperwork and sufficiency of their systems.

Passive: FBOs show a bare minimum of compliance by not taking their own initiative or showing real commitment to improve. A passive mindset such as this was considered by AOs as extremely difficult to deal with as it often led to what they termed 'yo-yo' behaviour where broad compliance was achieved only temporarily and often not sustained from one regulatory visit to the next. FBOs with this mindset were motivated more by a desire to avoid enforcement action and incur financial or reputational costs than by a real appreciation of the public health risks that their business posed.

Disinterested: this type of mindset is the sort that drives FBOs who show deliberate non-compliance. It was generally thought to be rare yet could occur just as easily in small, medium and even large food businesses. The best indicator of a FBO's disinterest was likely to be a clear lack of ownership for food safety. A key sign of a 'disinterested' mindset was likely to be that staff and managers alike all displayed a general air of disregard for an AO's presence, their feedback, education and food safety messages communicated during a visit. The FBO was unlikely to take much interest in their score on any food hygiene rating scheme (FHR/IS).

Research conducted for the FSA by Wright et al (2012) identified five categories of businesses, namely:

Amoral calculators: these intentionally breach regulations for the sake of financial gain, disputing or disregarding risk to people.

Dependent: these dutyholders wait upon advice or instruction from regulators and other third parties to make improvements and view food hygiene as something driven by third parties. They tend to view requirements as unfairly complex and unreasonable to expect them to take a lead in understanding and applying. They

may have low levels of knowledge and training, and may not have any clear perception or knowledge of the risk posed by food hygiene.

Doubters: doubt the significance of the risk posed by food hygiene and the effectiveness of food hygiene regulations and requirements in managing these risks. They may have the capability to understand requirements but doubt the risk. They may express cynical view to staff and do not promote compliance other than for legal purposes.

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

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

It is noteworthy that Wright et al do not explicitly make links between these types to any of the structural aspects of organisations. Another important aspect is the potential utility of these business 'caricatures' in providing a practical tool for inspectors. The possibility of applying these findings to guide the inspection process is discussed in Chapter 8.

5.4 Identifying and tackling multiple barriers to compliance

Although this review discusses structural, behavioural and cultural determinants of compliance separately, many of the studies considered for this review addressed multiple factors, with findings indicating that relevant behaviours arise from a combination of psychosocial (ie behavioural and cultural) and practical (business/structural) considerations. For example, an in-depth investigation of business perspectives on securing compliance in the context of environmental law found that compliant behaviours were influenced by business drivers and capacity to comply, as well as their perceptions of risks Wright et al (2011, cited in Wright et al 2012).

A large scale questionnaire study administered by researchers at Cranfield University revealed a spectrum of challenges hindering compliance of UK food business enterprises to food safety management systems. These were described as three-fold: financial, infrastructural and people related. The study identified the five topmost challenges as: lack of technical knowledge and skill of employees (58 per cent), employee resistance to change (58 per cent), lack of awareness of the requirement (40 per cent), high cost of development and implementation (26 per cent), and inappropriate infrastructural capabilities for validating and verifying FSMS (30 per cent). A major challenge stemmed from getting the right infrastructural capacity to plan and implement the processes needed for validating control measures, and verifying the effectiveness of the system developed. Consequently, external agencies were frequently contracted for validation and

verifications. As might be expected, SMEs were at a disadvantage in this respect because they were not able to benefit from the economies of scale provided by bulk rates from outsourced laboratory testing services. Interestingly however, testing the null hypothesis between SMEs and large enterprises revealed no statistically significant difference between the challenges faced by SMEs and large enterprises in the UK (Mensah and Julien et al., 2011).

Reasons for workers choosing not to use hearing protection in an HSE study included: practical problems (unable to hear important communications), peer pressure (less use when others also chose not to), reluctance of supervisors to enforce use of hearing protection, and 'worker attitude' (e.g. choosing not to use hearing protection as a result of feeling it had been imposed without consultation). Among employers a 'general lack of compliance and awareness' was identified as a common factor in failure to ensure effective use of hearing protection (Brueck 2009).

In order to overcome staff apathy or resistance, it has been suggested that responsibility for food safety within organisations must identify *all* perceived barriers to food-safety practices among employees by asking about factors that make it difficult (or impossible) to comply with food-safety guidelines. To identify negative attitudes, employees should be asked to describe unfavourable outcomes that may result from complying with guidelines. After determining barriers and attitudes to target, food safety professionals and managers are better placed to develop interventions to meet employees' needs (York et al., 2009a). Chapter 7 of this review discusses characteristics of successful interventions in more depth.

6 Behaviours and cultures within the enforcing organisation

Chapter summary

- Regarding evidence quality, it should be noted that recent qualitative work commissioned by the FSA provides the majority of evidence on this topic. However some of the data is largely anecdotal and there is limited opportunity to compare or consolidate some of the evidence presented here with other sources.
- There is potential for basic characteristics of the working environment to impact on the behaviours of food safety professionals. For example seating food teams close together in an office can facilitate discussion about regulatory decisions, potentially helping Environmental Health Officers (EHOs) resolve dilemmas encountered in their work with local businesses.
- Local authority restructuring potentially affects the time some staff are able to spend on food safety enforcement although the impacts of this have not been investigated empirically.
- Visits to FBO premises can serve a number of purposes and take a number of different forms. For example, 'pop-in' visits can foster ongoing dialogue and engagement with local businesses about food safety issues.
- Regarding inspection content, a bias towards visible evidence of food safety (such as cleanliness) has been reported in the past. However it appears that the introduction of HACCP and other new initiatives have been successful in orienting inspectors towards more systemic and cultural aspects.
- Using language that FBOs can relate to is important. When describing food hazards, qualitative descriptions rather than statistics are easier to understand and potentially have more impact.
- The sense of duty LA enforcers have towards public health is upheld concurrently with a commitment to supporting the local economy. Enforcers are conscious of the legacy of

major incidents such as the 2005 South Wales E.coli outbreak (potentially prompting a more risk-averse approach) but also aware of the need for regulation to be less burdensome to business as recommended by the Hampton Review (Hampton 2005).

- Raw inspection scores can be poor predictors of foodborne illness: however EHOs tend to take an approach with a much broader definition of success than improved compliance ratings and look for (often subtle) qualitative indicators such as shifts in FBO mindsets and evidence that food safety messages have been understood.
- Enforcement action is viewed by EHOs as a last resort for most types of business: sole use of enforcement risks FBOs not understanding their contraventions and how best to rectify them.
- Enforcement strategies should be responsive to the prevailing culture within food businesses; there is no 'one size fits all' strategy to secure compliance. The provision of advice and education are seen as key elements of the inspector role: the application of enforcement measures represents only one aspect.
- Inspectors strive to take a partnership approach to enforcement, with enforcers and businesses working together to achieve regulatory compliance. This is said to be particularly effective with regard to helping small businesses to understand and meet their responsibilities more easily.

This chapter concerns the role of enforcing organisations with respect to compliance; this follows on from previous chapters which have focused on behaviours and cultures within dutyholding organisations. It begins with a discussion of structural factors that potentially impact on enforcement and then moves on to summarise evidence about enforcement behaviours. In line with the previous, similar review conducted for the FSA four years ago there is a considerable amount of evidence on communicating and interacting with dutyholders so this topic forms the main content of this chapter. The chapter concludes by presenting available evidence on the enforcers' views on their role and what achieving compliance means.

It should be noted that recent work commissioned by the FSA provides the majority of evidence in this area. A lengthy report documenting qualitative research with authorised officers (AOs) and enforcement managers (EMs) provides many insights into ways of working within local authority enforcement teams, together with views on aspects of their role (Bukowski et al, 2012). However the data that it presents is exploratory and, arguably, anecdotal in nature and its findings may not be representative of the profession more widely. Also, in the absence of other, similarly themed UK studies there is limited opportunity to compare or consolidate the evidence it presents with other sources.

6.1 Contextual factors within the enforcing organisation

Basic characteristics of the working environment may impact on the behaviours of food safety professionals. Bukowski et al (ibid) reported that most 'food teams' sit close together, sometimes in a room separate from other sections of the Environmental Health or Public Protection department. Members of such teams who participated in the study preferred this type of working arrangement as it allowed good dialogue between AOs and free exchange of ideas before and after conducting regulatory visits. This facilitated the sharing of insights regarding the types of regulatory activity which were working and which were not. This was said to contribute to a 'feeling of support and sense of shared responsibility'. For example, if an officer encountered a dilemma while they were out on a visit they were easily able to share this with the rest of the team, potentially enabling them to make more informed regulatory decisions in the future (Bukowski et al, ibid).

Bukowski et al report structural changes associated with budgetary pressures on local authorities; for example those in the senior role of Enforcement Manager (EM) had taken on a wider range of responsibilities in recent months and had grown accustomed to undertaking both managerial and frontline tasks, such as human resources and investigations of imported foods. Others had broadened their remit, for example, going from managing the Food Service to managing other EHO functions as well, such as health and safety, pollution from commercial business, licencing and noise. As a consequence of this, managers reported being able to give less time to food safety regulatory work (Bukowski et al, 2012). There is no available evidence however (within the bounds of this review) that confirms the impact of such changes.

The FSA's evaluation of the Food Hygiene Rating Scheme (FHRS) in Wales identified some concern that planned changes to operations would add pressure on workloads. Mandatory display of FHRS results was welcomed by all respondents and implementation of this was generally viewed as a means to induce positive change among non-compliant businesses. However, EHOs anticipated that monitoring and administering the display of FHRS ratings would have resource repercussions for food safety teams. Formal requests for revisits and appeals from food businesses were expected to rise as a consequence of the FSA plans to make inspection reports public and the introduction of mandatory display of FHRS ratings (Vegeris and Smeaton, 2013). Outside the UK, it has been noted that increasing pressures on governmental inspectors puts them at potential risk of burnout and notes that the quality of the psychosocial environment they operate within is an important issue for society, enterprises and the affected individuals (Arbejdstilsynet, 2011, cited in Niskanen, 2013).

6.2 Enforcement approaches and behaviours

A range of actions are available to enforcers and an array of factors determine their application. Recent research commissioned by the FSA addressing food safety regulatory decision-making (Bukowski et al, 2012), the diagnosis of cultures in FBOs (Wright et al 2012) and work conducted as part of the process evaluation

of the national FHRS (Vegeris and Smeaton, 2013, 2014) provides the majority of evidence summarised in this section.

6.2.1 Approach to inspections

Inspections are a key part of enforcement, especially when coupled with penalties, and they also provide an opportunity for disseminating information and knowledge about how to comply. Qualitative work with inspectors (conducted by Bukowski et al for the FSA) suggested that UK food safety enforcers tend to adhere to what they considered is a tried and tested approach: ie a full inspection followed by enforcement action where warranted. Although this approach should enable authorising officers (AOs) to make a comprehensive risk assessment of the food establishment, it has been noted that this 'one-size fits all' approach fails to take account of difference in FBO mindset and position along the FBO compliance pathway. For example, while a full inspection would be necessary to assess standards in the premises of 'disinterested' FBOs it is likely a monitoring visit or partial inspection would be sufficient to verify standards in the premises of a 'reactive' FBO (Bukowski et al, 2012). The authors of the study concluded that more could be done to encourage AOs to adopt these flexibilities into their regulatory practice. These include:

- LAs reassuring AOs of the merit in adopting more targeted regulatory approaches;
- The FSA making clear their desire for increased flexibility in the delivery of official controls by AOs;
- And the FSA and LAs promoting the idea and give clear examples of better regulation.

There appears to be consensus that the inspectors' approach needs to be guided by the prevailing food culture within the organisation. Wright et al (2012) highlight the importance of an assessment of safety culture, which should include an assessment of FBO's perceptions of food safety regulations and risks within that. They stress that the type of intervention needs to match the expressed attitudes of the FBO, such as highlighting food safety risks if these are not recognised by the FBO, citing simple risk controls if the FBO feels compliance is impractical and conveying key messages and information to redress any problematic aspects of the FBO's food safety culture.

The same study documents significant variability in approach. Some AOs can be more reticent to apply enforcement even to the most disinterested and 'rogue' FBOs, because they fear this could precipitate disengagement and damage any hope of achieving compliance in the long term, possibly increasing the potential for consumer harm. To these AOs, the decision to steer away from enforcement was not viewed as 'light-touch'. In contrast, it was seen as adopting a more problem-focused approach to tackling the causes of compliance: ie deal with the FBO's attitude first and the right behaviours will follow. Short visits (often called 'pop-ins') in food businesses, especially those where the AO were concerned about slipping standards, were regarded as a valuable intelligence gathering tool. Regular but

brief visits of this type were said to be particularly useful in ensuring passive and reactive FBOs sustained their levels of compliance (Bukowski et al, ibid).

It is evident from studies conducted outside the UK that other regimes differ significantly and that some are more prescriptive. For example, Danish health and safety enforcers employ six methods of inspection, including a formal screening stage to identify those enterprises with significant OSH problems subjected to a thorough, adapted inspection. There is a strong emphasis on dialogue based on the enterprise's own experience about health and safety issues which the Danish Working Environment Authority (WEA) plans to 'further intensify' (Arbejdstilsynet, 2011b, cited in Niskanen, 2013).

6.2.2 Content of inspections

A recent UK-based study involving detailed scrutiny of EHO activities has shown a tendency for EHOs to identify visual/rule based items (such as design and construction, facilities, equipment, cleaning and storage) as opposed to items which represent a significant risk of foodborne illness. This traditional 'snap-shot' protocol is said to be relatively ineffective in identifying the significant risks underlying foodborne illness and it is claimed that EHOs continue to primarily pursue a 'walls, floors, ceilings' approach to inspections in contrast to an interrogation of the actual systems of working (Green and Kane, 2014). This tendency is attributed to the ease with which a dirty floor or wall can be spotted, compared to the task of interrogating a chef as to his/her operational details such as the times and temperatures he aims to achieve when preparing a particular dish on a busy Saturday night (Green and Kane, ibid). The authors suggested that EHOs' time and efforts should be directed more towards risk as opposed to visual/rule based misdemeanours, and also that the relationship between the EHO and FBOs should be further studied with a view to using their 'joint areas of expertise' to ameliorate detected problems.

Reports of inspectors taking a 'snapshot' approach to inspections are at odds with descriptions of the more qualitative, subtle observations made by EHOs regarding safety culture described in the previous section, and with the requirement upon them to assess 'confidence in management' systems (Griffith et al., 2010b). However Green and Kane relied solely on archive retrieval of inspection reports for their data, while former study draws on the self-reported experiences of EHOs themselves. It is possible therefore that the paperwork accessed by those authors did not fully capture the systems and culture-oriented aspects of the inspection that took place. Also, critically the research (although published in 2014) refers to food inspections carried out between 1991 and 2004. Since this work was concluded significant changes have taken place including incorporation of the principles of HACCP into UK legislation in 2006 and the introduction of Safer Food, Better Business (2005), and rollout of the National Food Hygiene Rating Scheme (2010).

In order to ensure that assessments of food safety culture take a sufficiently wide view, Wright et al (2012) recommended that questions to dutyholders should 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 and pest control.

Inevitably particular foodborne pathogens are likely to become a topic of discussion with food handlers and/or operators during a food premises inspection if they have been the subject of recent publicity. In a Canadian study it was noted that a specific pathogen would be the focus if it had recently been implicated in foodborne illness, particularly if a case had received media attention.

> ‘If it's the organism of the day, if it's in papers or if you have outbreaks, then that will surface.’
>
> Canadian food safety inspector (Pham et al., 2010, p.348)

6.2.3 Communication between the enforcing body and the dutyholder

Communication style and approach plays a key role in influencing dutyholders to comply. This is not only the case for inspections which constitute only one aspect of regulator-dutyholder interaction, but also for other forms of interaction including the production of written guidance and documentation for the use of dutyholders. This potentially applies to other face-to-face interactions not involving inspections such as awareness raising and training events.

Style of verbal communication

Attention to style and content of verbal communication used during inspections can help to ensure that messages about compliance are properly communicated to food businesses. Enforcers report consciously adopting language and concepts that FBOs can relate to (Bukowski et al, 2012). Yiannas (2009, cited in Griffith et al., 2010a) argued that in trying to get risk messages across to food handlers, a personal qualitative approach is more successful than a quantitative approach i.e. rather than present statistics on the number of people ill, it is more productive to present examples/accounts and pictures of those made ill or killed by food poisoning.

It is helpful if guidance refers to common barriers such as perceptions that compliant behaviours take up too much time. For example, employees should be reminded that many positive behaviours require little time to accomplish: for example, twenty seconds for hand washing, and similar lengths of time to take temperatures and sanitize a contaminated surface guidelines (York et al., 2009a).

The manner in which dutyholders are spoken to directly impacts on the quality of relationship they are able to establish with an inspector; when inspectors get this right this increases the likelihood that businesses will welcome advice and intervention. Newly compliant businesses have been described as ‘highly

appreciative' of AOs investment and genuine interest in enabling them to comply, viewing them as 'a supportive force' in boosting their reputation and growth of their business (Bukowski et al, 2012).

Style of written communication

Food safety infosheets described as 'standalone communication tools' directed at food handlers have been used to support a positive safety culture in US food businesses. A recent US research study investigated the potential of a 'novel communication tool' in influencing food handlers in a food service setting to change their behaviour. The tools are designed to meet the specific information needs of food handlers and generate dialogue among this group. Each infosheet contains a news story about an outbreak of foodborne illness, graphics, and prescriptive information. Infosheets were posted in highly visible locations, such as kitchen work areas and at hand washing stations. Video observation was used to determine that the infosheets positively influenced the food safety behaviours of food handlers, as demonstrated through increased hand washing frequency and reduced number of cross-contamination events (Chapman et al., 2010). The infosheets used in the study were based on four emotion-generating factors that were found to support a culture of food safety within a workforce:

- Storytelling: Storytelling was used to bring attention to the consequences of particular actions or circumstances.
- Dialogue: The infosheets were designed to generate dialogue within food service settings.
- Surprise: The information was presented with elements of surprise, such as humorous graphic images or sobering data.
- Context: The infosheets put prescriptive food safety information into a relevant context for food handlers.

Concise, easily digestible written materials potentially serve as a memory aid for workers who don't have time to study long documents. A Canadian food safety study recommended the use of information sheets to reinforce food safety knowledge gained through food training (McIntyre et al., 2013). In an HSE study farming managers suggested a legislative 'crib sheet' of everything the self-employed (smaller) farmer needs to know would be a useful resource (BOMEL LTD, 2009). Within UK food safety it is evident that the FSA already have material of this type available (for example short guides to completing HACCP[6]).

[6] http://www.food.gov.uk/business-industry/caterers/haccp

6.2.4 Decision-making

Foodservice inspection is a cornerstone of local public health, yet international data suggests that raw inspection scores can be poor predictors of foodborne illness: an examination of over 160,000 inspections in Tennessee, USA over seven years found no difference between scores of food services associated with outbreaks and those that were not (Jones et al., 2004, cited in Powell et al., 2013). In the UK there is recognition that qualitative indicators are important and AOs take an approach to their regulatory work with a much broader definition of success than a rise in a food business compliance rating. They look out for shifts in FBO mindset and evidence that food safety messages have been understood. These require more subtle means of measurement and involve AOs making qualitative assessments of food business practices and attitudes that exist within a food business, spotting "tell-tale" signs that the FBO and staff have improved since their previous intervention and that they show potential to continue in the same vein (Bukowski et al, 2012).

The sense of duty some EHO enforcers have towards public health is upheld with a concurrent commitment to supporting the local economy. In a sense their priorities are two-fold: on the one hand encouraging growth in local food businesses; on the other protecting consumers from harm. Both businesses and members of the public are therefore seen as their customers. They encounter a daily challenge to manage priorities of food safety enforcement, efficiency savings and political and local interests (Bukowski et al, ibid). A message of 'co-responsibility' appears to be embedded in the food team's culture of some LAs. In these cases, enforcers strive to establish a 'shared understanding' with food businesses and emphasise individual duty to establish a relationship with FBOs that encourages them to take responsibility for compliance (Bukowski et al, ibid).

Analysis of qualitative data arrived at three key factors underlying decision-making among AOs, these being (i) proactive work, (ii) enforcement (eg graduated escalation in response to non-compliance) and (iii) public health protection, with public health protection being the most important factor, shaping the relative emphasis on the first two. Another key consideration for decision making was *'FBO mindset and position of the food business along the compliance pathway'* (Bukowski et al ibid, p.4). Specific concerns affecting decision-making included being blamed for 'another Pennington' (ie the 2005 South Wales E.coli outbreak); and a perceived pressure at the local and national levels to be more business minded and strive for better, less burdensome regulation, in line with the recommendations of the Hampton Report (Bukowski et al, ibid).

6.2.5 Application of sanctions

The 2010 review for the FSA found that sanctions, irrespective of the size of the penalty, can impact on dutyholder behaviour, as can 'naming and shaming' non-compliant dutyholders, particularly among those for whom reputation is important. There was less emphasis on sanctions in the literature identified for the current review, and in particular a lack of new studies exploring their effectiveness.

Types of sanctions

Three types of sanctions can be identified which are used in connection with inspection practices (Rouvière and Caswell, 2012). These include:

- Repressive sanctions: Regulatory agencies can use penalties, prosecution, and recalls to punish intransigent food operators for committing an offence or repeatedly breaching regulations. Sanctions for non-compliance may include the closure of facilities, seizure of products, and disqualification from the market.
- Informative sanctions: Following a breach in regulations, enforcement agencies may mandate certain corrective actions in order to motivate food operators to comply. There may be a hierarchical spectrum of sanctions depending on the severity of the regulatory offence. Less severe violations may result in advice, notices, and warnings being given to encourage non-compliant firms to reach compliance through corrective actions. These corrective actions can be imposed by the authorities and/or left to the discretion of food operators.
- Sanctions through negative information provided to consumers: Regulatory agencies can display the results of official inspections and findings in order to disclose information about food operators to their customers. These are often referred to as ‘‘naming and shaming’’ programmes. The names of non-diligent companies are posted on the Internet, in newspapers, or at places of business. Another example is obliging food operators to display inspection results to keep customers informed.

UK EHOs routinely apply the first two types of sanctions through for example warning letters, improvement notices, cautions and prosecutions (Bukowski et al, 2012). While not normally considered a ‘sanction’, the awarding of low FHRS ratings represents the latter type.

Implementation

According to Bukowski et al’s (2012) qualitative work with food safety inspectors, enforcement action is a last resort for most types of business: there was a view that sole use of enforcement meant FBOs were unlikely to understand their contraventions and how best to rectify them. However early stage intervention work was thought to be wasted on ‘disinterested’ FBOs given their ‘wilful non-compliance and blatant disregard for law’. Enforcement action was usually considered the only available option for Authorising Officers (AOs) to use in these circumstances. Many AOs were sceptical of the impact even the strictest enforcement actions would have to shift the mindset of these businesses. Public protection could successfully be achieved but only short term, unless the food business was formally closed due to persistent disregard for the law. Some AOs saw the FBO’s wilful disengagement with food safety issues and compliance with the law as best treated by an AO displaying equal disregard for the FBOs own priorities and challenges. If an AO taking this approach found cause for concern during a visit, they would probably move straight to enforcement, leaving no room for giving a food business opportunity to comply (Bukowski et al, ibid).

Stepping up inspection activity

A recent Danish review (Merkelsen, 2013) revealed potentially negative consequences of stepping up inspection activity following a national food scandal centring on the Danish Veterinary & Food Administration (DVFA). The consequences of the increased funding in the DVFA were observed in local canteens. Not only did they receive more frequent control visits by inspection officers, the control was also more intensive, often to a degree where the canteen would receive critical remarks for minor details that previously would have passed without any notice. The widespread scepticism towards DVFA increased when the authorities received additional funding in order to intensify their control visits. Many respondents expressed how the inspection officers seemed to be more concerned with finding formal irregularities in the paperwork than with the actual food safety. A comment from an FBO respondent demonstrated considerable cynicism towards their approach:

> *'They [DVFA] had to prove that they were worth all that money and the only way to do that was to detect more irregularities and file more critical reports. And even in a kitchen with the highest hygiene standards you can always find something if you look hard enough. It is after all a working place*.'
>
> FBO operator (Merkelsen, 2013, p.255)

A large study of FBOs in Finland reported contrasting findings (Mari et al., 2013). The more often the official inspections by the local inspector were performed, the more often the FBOs saw that the noncompliances detected by the inspector were significant in enhancing product safety. A significant correlation was also noted between more frequent inspection visits and negotiating about the noncompliances detected with the inspector.

There can be other unintended impacts of stepping up inspections in terms of quantity. Performance guidance for the Finnish OSH inspectorate agencies places emphasis on the number of OSH inspections carried out. But in this case it is suggested that the increase of inspections has occurred partly at the expense of their quality (Niskanen, 2013).

6.3 Cultures within enforcing organisations

Few studies address the significance of cultures within enforcement bodies directly and it is it is therefore difficult to draw firm conclusions regarding the impact of these factors upon compliance. Nevertheless there is more relevant evidence of this type available to the current review than was the case four years ago. In the main this derives from the large qualitative study involving local authorities and food businesses conducted by Bukowski et al for the FSA. Because of the relevance of its findings, as with earlier parts of this chapter, this section draws heavily from that source.

6.3.1 Attitudes to the enforcement role

The literature indicates that inspectors strive to take a partnership approach to enforcement, with enforcers and businesses working together to achieve regulatory compliance. This is said to be particularly effective with regard to helping small businesses to understand and meet their responsibilities more easily. Such an approach helps to achieve higher levels of compliance and gives greater consumer and employee safety (Green and Kane, 2014).

While the FBO may be ultimately responsible for running a safe food business, authorising officers (AOs) are conscious of their role beyond that of enforcers and regulators, and the requirement to some extent to be educators and consultants. This marks a departure from the old model of 'pure enforcement' work, where the AO's role was more strictly defined by their responsibility for administering interventions and enforcement. Bukowski et al (2012) reported that this shift towards a wider view of regulatory work (sometimes termed 'better regulation') was viewed positively by AOs because it was felt this could encourage food businesses to take more ownership of compliance.

Researchers noted a divide between those who see the aim of regulatory work as, ultimately, to ensure broad compliance was attained by all food businesses, and those who thought it should be geared towards 'shifting the hearts and minds of FBOs' and as a result prompt FBOs to take ownership of compliance. The latter view indicates the extent of the challenge that many AOs saw themselves engaged in (Bukowski et al, ibid). Enforcers find themselves in the position of treading the line 'between policeman and consultant, or sheriff and social worker' (Green and Kane, ibid). Similar observations have been made regarding the role of health and safety inspector, who 'may act as a regulator, as a consultee, or as an investigator' (Bouder and Loftstedt, 2010).

It has been suggested that a distinctive feature of the UK system which has implications for the role the inspector takes, is that it relies on smooth enforcement and self-regulation. For the last fifty years, safety has been conceived according to the following principles: it is the responsibility of duty-holders to ensure that risk is maintained as low as reasonably achievable (Vogel, 1986, cited in Bouder and Lofstedt 2010). Comparing the USA and UK law enforcement practices, Vogel (ibid) has argued that, unlike the United States, where enforcement is highly politicised, rigid and legalistic, the success of the various inspectorates in Britain was to be judged not by their ability to secure compliance with minimal safety requirements but by their success in persuading employers and managers to assume greater responsibility for the physical welfare of their employees. For example, the role of British Government inspectorates is often to persuade rather than prosecute: the ultimate responsibility for improving the working conditions for employees rested upon the owners and managers themselves.

6.3.2 Reflections on what compliance looks like

The FSA's recent qualitative work with local authority inspectors provides potentially valuable insights into the aims of food safety enforcement work in the UK (Bukowski et al, 2012).The authors report that among local authority enforcers

there appears to be a clear consensus on the importance of looking at compliance in a wider sense than structure, cleanliness, hygiene, or HACCP. While these factors are vital in making an objective assessment of risk, the significance of attitudinal factors in the overall judgement AOs make of food businesses was strongly emphasised. This wider definition is said to underpin the goals which AOs set for their own day-to-day regulatory work and the motivations driving many key decisions (Bukowski et al, ibid).

Compliance ratings, while useful for indicating the level of public health risk in an area, were believed to overlook important longer term outcomes of better regulation. The view was that a more appropriate indicator would be the number of businesses successfully brought into sustained compliance, as a result of AOs' investments of time and effort. This was an area where AOs and EMs saw themselves adding public value.

There is variability in interpretation of, and attitudes to compliance can lead to misunderstanding of what constitutes compliance. Bukowski et al (ibid) report a perceived distinction between 'broad' compliance and 'full' compliance. Full compliance is associated with food businesses that go beyond minimum legal standards; in practice this means sustaining a high level of compliance and exceeding national guidelines or industry code of recommended practice. This is viewed by some AOs as the ultimate goal of their regulatory work. Encouragement of ownership of health and safety is another important goal ('ownership' is described in Chapter 5). A key objective of regulatory work is to ensure all EHOs take FBOs to a point where they are proactive in monitoring risk and ensuring the necessary controls are implemented.

Bukowski et al (ibid) report that the use of the 'Confidence in Management' scoring category has proved a useful framework allowing AOs to assess this kind of qualitative characteristics of safety culture systematically. The authors concluded that the current FSA scoring system and scoring guidance for AOs is therefore going some way to recognising the importance of capturing these less measurable indicators such as 'compliant will' and 'ownership of compliance'.

7 Interventions to promote compliance

Chapter summary

- Local authority food safety enforcers have welcomed the national hygiene rating schemes (the Food Hygiene Rating Scheme and Food Hygiene Information Scheme) as an approach to improving standards. There is a widespread perception that the implementation of the schemes has driven up food safety scores although to date there is no hard data that categorically proves cause and effect.
- More widely, certification and awards schemes appear to be effective in driving compliance. These tap into company motivations to remain competitive and win consumer confidence.
- Work in the USA has highlighted the importance of addressing ethnic diversity within local communities; this has been done by formally developing the 'cultural competence' of their staff to help establish a trust relationship with the local FBOs.
- Existing relationships within supply chains can potentially be exploited to disseminate good practice. However the scope to do this is bound by the prevailing cultures within a particular sector or supply chain, and also by the practical nature of risks that need to be managed.
- Knowing how to comply is an important first step towards compliance but is not a guarantee of it, and recall of training content can falter over time. The duration over which training has an impact is uncertain and regular updates are often needed to ensure compliance is sustained.
- Levels of knowledge among staff can differ across safety topics: an awareness of strong and weaker areas can be helpful in targeting future training appropriately. Educational materials need to be kept up to date with respect to new food technologies and food preparation techniques.
- Food handlers should be constantly reminded of their crucial role in ensuring safe food for consumers because they are the food service–customer interface: potential negative outcomes of non-compliance such as foodborne illnesses should be emphasised.

- Ideally training evaluations should have longer follow-up periods than traditional studies typically allow, to assess the extent to which improvements in compliant behaviour are sustained in the long term.
- The only reliable measure of effectiveness of food safety interventions material is through direct observation of food preparation practices, highlighting a need for food safety researchers to gather data on actual practices of food handlers.
- Regarding hand hygiene specifically it has been suggested that FBO managers could monitor the use of soap and paper towels. The amount of these items consumed would provide some indication of handwashing behaviour over a particular period.
- In hospitals, electronic devices have been successfully employed to monitor hand hygiene compliance, while in food processing plants CCTV has been used. However these approaches may not be practical or affordable for small FBOs.
- Barriers to compliance need to be understood fully in the design of training and other interventions; the Theory of Planned Behaviour offers a useful framework for this approach.
- Training needs to be affordable, practical and in context. Simplicity and relevance is a key requirement. Information should be task specific and learners should not be overburdened with irrelevant information.
- To overcome attitudinal ambivalence when trying to convey risk messages to food handlers, qualitative descriptions (eg, details about people made ill by food poisoning) is more successful than quantitative information (eg, statistics about food poisoning).
- Visual material should be hard hitting and the placement and prominence of signs should be fully considered in relation to activities being targeted.
- Compliant worker behaviour appears best reinforced via the use of multiple channels of feedback, including management communication combined with feedback on performance levels. Hand hygiene in particular is viewed as a complicated behaviour and appears to benefit from a multifaceted approach to feedback provision.
- Incentive schemes which award prizes for best compliance over a particular period can also motivate employees.

Previous chapters have described the factors that affect compliant behaviour. This chapter brings together evidence on in-house interventions that can make a difference with reference to those factors. In-house training programmes are addressed first, followed by other types of interventions that can be implemented within companies, with or without the support of enforcement bodies.

This chapter also considers the influence of statutory measures or ‘interventions’ such as certifications and awarding schemes. Awareness-raising campaigns and other in-house interventions initiated within organisations are discussed in the next chapter

7.1 Schemes led by enforcement bodies

7.1.1 Information and training for inspectors

There is a strong appetite for training among enforcers both within the UK and outside. For example in the aforementioned UK qualitative study there was evidence of links EMs had established with academics and local universities and a strong emphasis on updating staff expertise on food safety issues (Bukowski et al , 2012). In a Finnish study, health and safety inspectors considered that developing the quality of inspections and the professional skills of inspectors was a key factor in their effectiveness. The study also highlighted the need for professional skills of inspectors to correspond more with changes to current working life (Niskanen, 2013).

With regard to enforcement skills, comments made by UK local authority enforcers, indicate that training to help improve consistency in approach across local authority boundaries is welcomed, amid acknowledgement that some variation in approach is inevitable. Across one region, seven LAs joined forces to run a risk scoring consistency training programme intended for all frontline food safety AOs. EMs from across the region were concerned that the degree of inconsistency in risk scoring was a key reason for the variation in light-touch and heavy-handed enforcement. As a result EMs felt some businesses were being over-regulated as AOs sought to encourage best practice while others were not being brought into line quickly enough (Bukowski et al, ibid).

A Canadian study of public health inspectors (PHIs) revealed similar concerns about a lack of consistency (Pham et al., 2010).

> '*There are a lot of grey areas and there's a lot of different interpretations of those grey areas. And what one health department will interpret, another health department may interpret totally differently.*'
>
> Public health inspector (Pham et al., 2010, p.347-8)

Canadian PHIs also identified issues in relation to recent developments in food safety, specifically information on foods newly associated with foodborne illness and information about emerging pathogens and issues. Adequate food safety information about specialty foods (such as exotic meats, balut eggs, and ceviche) was said to be lacking and some foods types were not currently addressed in Canadian legislation (Pham et al. 2010, ibid). Fellow PHIs were seen as an important resource for updating their knowledge base. Monthly meetings at their local health units provided a forum for discussing issues, asking questions, and sharing comments and suggestions. A minority of participants also sought information from other PHIs on the Canadian Institute of Public Health Inspectors' (CIPHI; the professional organisation that represents public health inspectors across Canada) on-line discussion board (Pham et al., ibid).

A US report highlights the importance of addressing ethnic diversity within local communities. 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 (Beegle, 2009, cited in Wright et al, 2012). The FSA's work to develop a tool to diagnose culture in FBOs draws attention to the need to ensure that food safety culture is assessed appropriately in different cultural contexts (Wright et al, 2012).

A number of HSE reports have described how existing relationships within supply chains can be exploited to disseminate good practice. However the scope to do this is bound by the prevailing cultures within a particular sector or supply chain, and also by the practical nature of risks that need to be managed. For example in farming there is a strong industry culture which encourages safe sharing of equipment and services (BOMEL LTD, 2009). In transport and logistics the peripatetic nature of many workers (ie drivers) means that where best practice is demonstrated there is potential for multiplier effects up and down supply chains (Wilson et al., 2010).

In construction where work activities, particularly for small building contractors, require equipment hire, supply chain initiatives have helped ensure that safety information (such as noise and vibration measures) is provided at the point of hire. HSE have also worked with building materials suppliers to encourage the manufacture and supply of lighter products that carry less risk to musculoskeletal health of workers handing them. At the client end, local governments have been helped to specify that particular safety procedures are followed at the stage of commissioning large building projects (Wilson and Tyers, 2011).

Another area where regulatory or enforcement bodies can reinforce compliance is the provision of training to dutyholders. Given the size of the identified evidence base on training and what makes it effective this is described separately in the next chapter which also refers to interventions implemented by employers and employer bodies.

7.1.2 Accreditation and certification schemes

The bulk of recent evidence regarding awards schemes centres on the introduction of the National Food Hygiene Ratings schemes in the UK. The literature search did not identify similar ratings schemes that had been implemented elsewhere in the last four years in 2010 or related evaluation work (although due to the rapid and necessarily constrained nature of this review, it cannot be assumed such evidence does not exist). A small amount of international evidence pertaining to certification schemes was identified and reviewed.

National Food Hygiene Ratings Schemes

At the time of the current review, the research undertaken by IFF and the Policy Studies Institute (PSI) to evaluate the national FHRS and FHIS schemes was still at a relatively early stage and had not yet reported on impact: to date only findings from the process evaluation have been published. However, some early findings appear to be indicative of a positive impact.

Emerging evidence suggests that the schemes are effective in motivating businesses to make changes to their policies and procedures. According to a survey of FBOs participating in the scheme (Adams et al, 2013), four in five businesses are reported to have made at least one change to their approach to food hygiene since their inspection and in most cases these are attributed – at least in part – to a desire to improve ratings/results. Changes attributed to a desire to improve ratings were most likely to involve food handling (38 per cent of businesses), documentation (38 per cent) and cleaning procedures (40 per cent). The vast majority implemented changes that inspectors believed would have a positive impact on hygiene standards. The scheme also appears to be successful in driving compliance in businesses who have failed to engage with food safety in the past; it was noted as encouraging that those with lower ratings were more likely to have made changes. Businesses who reported achieving a rating of between zero and two were just as likely to place importance on improving their score as those with a rating of three or four (89 per cent, 83 per cent and 88 per cent respectively). Nearly all (94 per cent) of those in the FHIS scheme with a result of 'improvement required' thought that it was important to achieve a pass at their next inspection (Adams et al., ibid).

Businesses appear to have been motivated primarily through commercial concerns and the need to remain competitive with other businesses in their locality. Although only half of all businesses were aware of the results of the competitors, the vast majority of all businesses thought that it was important to have a rating that was higher than other businesses in their area (86 per cent), with three-fifths saying it was very important (60 per cent) (Adams et al., ibid).Display of stickers/certificates in a location that was publically visible was also associated with higher levels of compliance (Vegeris and Smeaton, 2014).

The scheme is not likely to be a catch-all remedy, especially where resistance to compliance is entrenched. Although local authority officers in all parts of the UK reported increased rates of compliance over time, they identified a core group of low performing food business operators with whom they found it difficult to encourage positive changes (Vegeris and Smeaton, 2013, 2014). In Scotland there was a view that resources for revisits should be reserved for non-compliant businesses as opposed to operators rated three or four who wanted to improve their score (Vegeris and Smeaton, 2014).

International certification and accreditation schemes

There is a suggestion in the US literature that mandatory certification for restaurant managers and their employees leads to food safety improvements; a study of food service establishments in Central Florida found no difference between the respective totals of violations associated with chain and independent restaurants. Rather than concluding from this that the certification had no effect the authors suggested that the programme (established by the State of Florida) mitigated any expected effects of company-type on compliance, ie that served to bring independent restaurants up to the standards of chains (Murphy et al., 2011).

A survey of motivations and benefits among 144 ISO 22000-certified FBOs of varying sizes in Portugal showed the most important motivation to be

‘guaranteeing the confidence of the consumers’ (50 per cent provided this reason) followed by ‘meeting customer requirements’ (34 per cent). ‘Market differentiation’ and ‘involvement in and commitment to the food chain in product safety’ were also reported as important motivations. The most common ISO 22000 benefit cited was ‘improvement in food safety methodologies and practices and management system related documentation’ (50 per cent), followed by ‘improvement in customer satisfaction’ (32 per cent). After the implementation of the system, managers judged that company workers had become more food safety oriented and more motivated (Teixeira and Sampaio, 2013). There was significant correlation between the ISO 22000 implementation motivations and the company size. Interestingly the ‘cost reduction’ motivation was statistically correlated (positively) with the company size implying greater commercial motivation among smaller companies (Teixeira and Sampaio, ibid).

The theme of enhanced consumer confidence also emerged from a recent survey of Spanish firms with ISO 22000 certification who were distributed across various levels of the food chain. The most highly valued reasons were: (i) improved image in the market, together with (ii) the supply and/or manufacture (depending on the firm’s activity) of safer and higher quality products. Through the clearly defined and monitored processes and procedures required by ISO, the firms in the sample felt they would offer customers confidence and enhance their competitive advantage (Escanciano, and Santos-Vijande, 2014).

Among US food suppliers, the main driver for becoming Global Food Safety Initiative (GFSI) certified was to meet customers’ requirements in order ‘to continue their business relationship’. The second and third most important reasons were to enhance food safety and enhance quality assurance. Interestingly although the sample represented a fairly even spread of company sizes only 18 per cent declared that they had made significant capital investments in order to meet the standards (Crandall et al., 2012). Another US study suggested that certification and accreditation schemes appear to be of most benefit to smaller, independent FBOs. Authors examined food inspection reports from two health departments in Ohio from a one-year period to explore the relationship between certification training of personnel and food safety violations concluded that training programmes appear to affect most meaningfully those restaurants that are not part of chains or large franchises (Kassa et al., 2010).

In a study of Greek food businesses, those with HACCP certification for longer periods (especially those that were certified according to more than one standard) were found to have better performance in HACCP evaluation compared to those with more recent certification. In addition, slaughterhouses involved in rearing of animals as well, especially those slaughtering only one animal species, and which do not provide services for others, seem to have better performance as regards HACCP evaluation (Milios et al., 2013).

Despite the apparent compliance benefits of meeting the requirements of statutory or industry bodies there may be risks associated with single-mindedly pursuing licencing or certification. An HSE report points out that training people just to satisfy the requirements of insurance companies or to gain operator licenses

'misses the point', which is to teach better skills and safe methods of working (BOMEL Ltd, 2009, p.105).

7.2 In-house training

Education and training programmes are the focus of many food-handling behaviour interventions. However, a UK study suggests that the impacts of food handler training programmes are inconsistent, and programme evaluation is rarely conducted (Powell et al., 2013).

Even where training has been shown to be successful, a major challenge is ensuring that any positive changes are sustained. Bad habits can reappear and/or memory of training messages can falter. For example a survey of knowledge levels focussing on food safety training for food handlers (FOODSAFE) in Canada showed that recall declined significantly over time (McIntyre et al., 2013).

7.2.1 Training and knowledge

Having knowledge about how to comply is an important first step towards compliance but is not a guarantee of it. A recent FSA report remarked that food safety outbreaks due to food handler error or non-compliance with food hygiene procedures often occur despite appropriate training being received (Wright et al, 2012).

Inspectors participating in a Canadian study viewed that despite a basic level of food safety knowledge, some food handlers are unable to apply that knowledge on a day-to-day basis. An example was provided of a premises where food handlers recorded elevated temperatures in a refrigerator for several weeks. Despite knowing what the temperature of the refrigerator should be, no one took any action to address the issue. In that context there appeared to be no connection between checking the temperature and doing something about wrong temperatures (Pham et al., 2010).

Levels of knowledge among staff can differ across safety topics. For instance, a survey conducted among Austrian food handlers demonstrated a limited level of knowledge concerning the optimal temperatures for cooking, holding and storing foods. A high percentage of all the food handlers were able to correctly identify aspects of good hand hygiene practice such as necessity to wash hands after going to the toilet (90 per cent), to wash hands before using wax paper to handle foods (94 per cent) or to use warm water for washing hands (97 per cent). Yet only around three quarters (72 per cent) of the restaurant food handlers knew that the minimum duration of lathering the hands with soap was ten seconds. Food handlers who had received training at their current workplace scored significantly higher on safety knowledge than those without on the job training. Those most highly knowledgeable had passed the mandatorily required yearly food safety training. The authors recommended targeted educational material to keep up with safe food handling practices and new food technologies, and drew attention to the potential of mandatory on-the-job training of food handlers as required by EU regulation to significantly improve knowledge scores (Pichler et al., 2014).

Other studies report partial rather than complete success of training. For example, an evaluation of training provided to fresh produce farm workers in the UK showed mixed results. Correct responses to a question about correct action to take when staff had cuts on hands increased from 52 per cent before training to 100 per cent of correct responses after training. Also the number of participants who were aware that harvesting crates should not be kept directly on the ground increased from 58 per cent before training to 100 per cent correct responses after training. However there were no significant improvements with respect to other key questions such as 'only sick people carry food poisoning bacteria in their gut' or 'if blood dripped onto produce, the affected produce should be thrown away' (Soon and Baines, 2012). York et al., (2009a) showed training effects with FBO staff to be variable when compliance was broken down by activity, suggesting that some behaviours may be more susceptible to modification than others. For example the highest compliance rates (over 90 per cent) existed for 'leftovers labelled & dated', 'dry hands and arms with a single-use paper towel or warm-air hand dryer', and 'rinse hands thoroughly under running water'. The lowest compliance rates (less than 10 per cent) were observed for 'check temperature of food at the completion of reheating', 'wash hands after touching clothing/apron', and 'wash hands after touching body parts'.

Evidence from outside the food industry suggests that knowledge of routines does not always correspond with good adherence, and that staff may overestimate their adoption of compliant behaviour. In a Swedish study of surgical team members' compliance, marked underestimations of the number of door-opening occurrences during surgery was thought to indicate that presumptions of compliance with hygiene protocols may not be correct (Swenne and Alexandrén, 2012).

Evidence within the healthcare sector also suggests that poor knowledge and poor compliance extends to individuals in scientific professions where a high level of technical knowledge about the risks presented by contamination might reasonably be assumed. For example, prior to a training intervention in a hospital setting, only 70 per cent of health care workers were aware that alcohol-based hand sanitizer is the most effective method for reducing the number of pathogenic bacteria on the hands if the hands are not visibly contaminated with blood or other body fluids (Alemagno et al., 2010).

7.2.2 Characteristics of successful training programmes

A range of sources discuss the features that maximise the potential impact of food safety and other compliance-related training courses. This includes commentary regarding format and delivery as well as content.

Content and approach

According to Soon and Baines (2012), the Theory of Planned Behaviour (TPB, Godin and Kok 1996) and the Health Action Model (Whitehead, 2001) can be applied in the design of educational interventions to improve behavioural intent. The TPB offers a framework for identifying and targeting barriers to food safety (York et al., 2009a, 2009b). Soon and Baines (ibid) applied the model to

investigate handwashing intentions among fresh produce farm workers and used the findings to develop training. The findings in this study showed an immediate increase in knowledge gained between pre- and post-training. Based on the study the authors advised managers and supervisors to emphasise the positive outcomes of hand washing (e.g., safe food, less recall, and more profit for the company and workers) and potential negative outcomes (e.g., foodborne illnesses, product recall and lost business, and possible retrenchment or bankruptcy). Furthermore food handlers should be constantly reminded of their crucial role in ensuring safe food for consumers because they are the food service–customer interface. The authors also advocated the provision of adequate hand washing facilities to encourage food employees to use good hand washing practices and accept that changes take time to become embedded (Soon and Baines, ibid). York et al. (2009a) suggested:

- posting signs to remind employees to perform behaviours and inform them of the serious consequences that can result from not complying with guidelines;
- reminding employees that food safety behaviours are a requirement of their job, rather than distractions from the job;
- reminding employees that the behaviours require little time to accomplish (20 seconds for hand washing, and similar lengths of time to take temperatures and sanitize a contaminated surface guidelines);
- ensuring employees have access to necessary tools that are located in convenient areas in the kitchen guidelines.

Yiannas (2009, cited in Griffith et al., 2010a) has proposed a model for creating a ‘behaviour based food safety management system’. This starts with creating food safety performance expectations followed by education and training on required food safety practices, and subsequent development of a comprehensive food safety communication system. Food safety performance then needs to be assessed, measured against standards and the results fed back to employees who should be accountable. Consistent consequences related to performance should then be developed in terms of rewards and sanctions. It is argued that moving more towards this behavioural/food safety culture based approach to food safety management may help to reduce the burden of foodborne disease.

As an approach to understanding and addressing negative attitudes, York et al. (2009b) suggested that employees should be asked to describe unfavourable outcomes that may result from complying with guidelines. After determining barriers and attitudes to target, technicians, and managers can develop interventions to meet employees’ needs. In a worldwide context, Mortell (2012) recommended that an emphasis should be placed on clinicians’ moral and ethical obligations with respect to hand hygiene compliance, as part of training and orientation.

Following a US study which employed the Delphi method with food safety experts (Kim et al., 2013) concluded that when teaching deli employees about the risks associated with ready to eat foods it is beneficial to tell actual stories of individuals who have suffered from listeriosis or other foodborne diseases. This helps the

employee to respond to the story and realise that they play a key role in preventing the spread of foodborne illness.

Similar principles apply to successful communication more generally; ie approaches based on identifying barriers and drivers can be used day to day outside training. Communication between food safety managers/coordinators and production workers included explaining the importance of the programme to workers, linking the benefits of the programme to the procedures workers must follow, listening to workers' challenges regarding compliance with procedures, and working to improve the programme using workers' suggestions (Wilcock et al., 2011).

A key is learning from past mistakes, especially those that have happened within organisations: 'if the organisation is not communicating the risks of the job to its workers nor using previous unsafe incidents as learning opportunities, then workers will not be able to develop the skills to act safely, recognise and report hazards, and correct problems as they arise' (Payne et al., 2009, cited in Niskanen 2012).

Understanding the ways teams operate (including how behaviours of one members can influence that of colleagues) can also inform training approaches (Neal et al., 2010, cited in Kim et al., 2013).

Format and delivery

A US review focussing on hand hygiene in the food industry identified a number of features of training associated with positive impacts (Todd et al., 2010). According to the evidence reviewed, educational and training programmes for managers and co-workers should include:

- a hands-on orientation training programme for new employees on hand washing procedures and knowledge of the causes of foodborne illness;
- involvement of both managers and co-workers in the training;
- easily accessible hand washing facilities regularly stocked with necessary supplies;
- ongoing career-long refresher hand washing training and a support structure involving the whole food service industry;
- and advice from local health departments and their inspectors to improve hand washing practices.

Other research recommends simplicity and relevance. A study which sought to identify baseline food safety training practices for retail delis, all information provided should be task specific and learners should not be overburdened with irrelevant information (Lubran et al., 2010).

An HSE study involving managers of workers exposed to noise found training on its own did not guarantee the good use of hearing protection. Hearing protection

use was seen to be most effective in companies when combined with appropriate supervision and employee cooperation (Brueck, 2009).

A range of delivery methods including use of online training should be considered (Neal et al., 2010, cited in Kim et al., 2013). However from the evidence reviewed, it is unclear which training modality (for example face-to-face vs. online training) has most impact. Relevant findings tend to be confined to worker preferences and acceptability rather than effectiveness. For example, more than 80 per cent of the participants in a Turkish study (among workers in the agricultural sector) rated a YouTube video and hand hygiene demonstration as more practical compared to a training booklet and presentation slides (Soon and Baines 2012). In an American survey of food safety trainers, photographs/illustrations/graphics (55 per cent); presentations (52 per cent); video clips (41 per cent); regulatory guidelines (32 per cent); and fact sheets (30 per cent) were the top five types of training resources they preferred to employ with FBOs.

7.2.3 Feedback and monitoring

A study looking at sustaining hand hygiene behaviour in a UK context concluded that *'future hand hygiene interventions and training programmes should monitor the retention of knowledge and behavioural changes in hand hygiene practices over time'* (Soon et al., 2012, p.801). The authors recommended that training evaluations should have a longer follow-up period than traditional studies typically allow, with potentially greater commitment of resources to measurement and monitoring coupled with refresher training.

In the hospital hygiene literature, authors have highlighted the necessity of regular, routine observations and provision of continuous feedback to all staff to improve compliance and avoid deterioration of HH practice among surgical teams (Swenne and Alexandrén, 2012). An Australian study concluded that 'achieving a sustained improvement in hand hygiene compliance by healthcare workers will require a long term commitment at a national level' (Roberts et al., 2012). In the US, an evaluation of HACCP training for food operators working within Residential Childcare Institutions concluded that follow-up instruction would be necessary to ensure sustained compliance but acknowledged resource limitations would probably prevent this (Pivarnik et al., 2013).

Electronic devices have been successfully applied as an aid to monitoring (eg, Morgan et al., 2012; Higgins and Hannan 2013). In a US teaching hospital study a large warning sign was affixed to a door informing health care providers that the room was under electronic surveillance and that failure to perform satisfactory hand hygiene (HH) procedures would trigger an alarm. This resulted in significant improvements in HH behaviour, more so than flashing lights and line-of-sight cues that were tested in the same study (Nevo et al., 2010). Mortell (2012) recommended mandatory IPC hand hygiene surveillance involving all staff, regardless of status and position as an essential step to achieve and maintain higher compliance.

There is only a limited amount of evidence regarding use of automatic monitoring systems in a food safety context. In 2010, USA beef processor JBS started a trial

using video cameras as part of their third-party monitoring and auditing efforts (Crews, 2011, cited in Powell et al., 2011). Strategically placed cameras recorded footage that could then be observed by auditors around-the-clock and random audits could then be conducted remotely. Not only did this allow for immediate feedback, it also proved an effective training tool for employees, as they could observe and learn from watching themselves at work. Improvement at the pilot plant was seen in days instead of months and compliance rates consistently exceeded 99 per cent. Errors could also be addressed 'almost immediately' before problems developed.

Smith (2009, cited in Todd et al., 2010) reported on a hand hygiene survey of food processing companies in the United Kingdom which revealed that 60% of respondents monitor hand hygiene compliance in high-risk food preparation areas, and the most popular methods are observation by a supervisor and closed-circuit television. However this requires resources and staffing not usually available to smaller businesses.

Although resource intensive, researchers have concluded that the only reliable measure of effectiveness of food safety interventions material is through direct observation of food preparation practices (Anderson et al., 2004; Chapman et al., 2010; Redmond et al., 2004, cited in Powell et al., 2011). The primary benefit of observation is that it does not depend on reported actions and can be considered objectively by someone other than the performer of the action (Redmond and Griffith, 2006, cited in Powell et al., 2011). Assessing food-handling practices of staff through internal observations, externally led evaluations and inspection results can provide reliable indicators of a food safety culture. Results can then be used by middle- and executive-level managers to modify interventions and further improve the organization's culture of food safety (Powell et al., ibid).

Within a food safety context and regarding hand hygiene specifically it has been suggested that managers could monitor the use of soap and paper towels. The amount of these items consumed would provide some indication of handwashing behaviour over a particular period (Todd et al, 2010). There is also evidence within the hand hygiene literature that measurement of cleaning substance usage can be a useful approach to monitoring compliance levels (Aboumatar et al., 2012; Fuller et al., 2012; McGuckin et al., 2009).

Who to train

Despite a broad consensus that it is not effective to train managers only, many US state policies only call for training and certification of managers in retail food service establishments. A controlled intervention study showed that manager training did not lead to significant positive change in the food stores they ran. The most common deficiencies were in the categories of debris on the floors, walls, and ceilings, and handwashing sinks that were not properly stocked or easily accessible. Despite these managers receiving training on the importance of cleaning and maintaining food preparation and service areas, they were either unable to transfer that knowledge to their employees or their employees did not respond to the information. The authors concluded that policies should be changed to require employee training and certification as well (Rowell et al., 2013).

Aside from the compliance benefits of training, a study focussing on health and safety in the agricultural sector reported that provision of training makes employees feel valued and worth investing in (BOMEL LTD, 2009). The same study also highlights a perceived need to regulate training provided by equipment manufacturers and commercial training bodies to ensure quality and consistency of approach.

7.3 Campaigns and other in-house activities

Interventions to improve compliance go beyond training, and depending on resources available and scale, can utilise techniques employed in advertising and social marketing. These approaches can also be used to reinforce messages learned through training.

7.3.1 Visual prompts and posters

A UK food study emphasised the importance of going beyond the impersonal and 'sanitized nature' of (for example) 'employees must wash their hands' signs. Sites should 'provide a personalised approach, support the food safety culture at a site by providing a personalised message, emphasising control and when posted, demonstrate to all members of the organisation the importance of risk-reduction practices' (Chapman et al., 2010, cited in Powell et al., 2011).

Findings from US research with food service employees (York et al., 2009b) suggested that signs should be hung in 'high-traffic areas' of restaurant kitchens and to attract employees' attention, and that they should:

- be in colours that attract employees' attention;
- begin with the questions, eg, 'Did You Know...?' (rhetorical questions increase the likelihood that individuals will process communications if message are perceived of low personal relevance);
- contain a unique statement informing employees how, when, or why to perform particular food-safety behaviours;
- and be persuasive: messages should stress serious consequences that could befall customers (eg, illness, death) and employees (eg, illness, death, loss of job) if food-safety guidelines are ignored.

The authors also suggested the use of signs printed in a 'newspaper article' format describing real foodborne outbreaks being traced to employees working in well-known restaurant chains and the consequences.

Nicol et al. (2009) highlighted the success of graphic images in advertising, which 'elicit the vicarious experience of the emotions and suffering of persons with life-threatening illnesses', most notably in anti-smoking campaigns. They suggested similar tactics could be employed in hand hygiene education to draw attention to the evidence of the morbidity, mortality and costs associated with hospital-acquired infections.

Yiannas (2009, cited in Griffiths et al., 2010a) argued that in trying to get the risk message over to food handlers a personal qualitative approach is more successful than a quantitative approach i.e. rather than present statistics on the number of people ill it is more productive to present examples/accounts and pictures of those made ill or killed by food poisoning. This approach helps to overcome attitudinal ambivalence which is likely to be a particular problem in food service operations and occurs where although handlers may want to practice food safety something else is considered more important, e.g. serving customers quickly may be considered more important than hand-washing.

The production costs of hard-hitting, up-to-date visual materials benefit from economies of scale. For example, in a statewide Australian hand hygiene campaign a graphic design agency was engaged to develop marketing collateral to support the campaign objectives. Project funding from the Clinical Excellence Commission in New South Wales covered the costs of campaign materials (Fitzpatrick et al., 2009).

The placement of hygiene aids themselves can serve as a visual prompt to use them, for example fixing handrubs to bedrails to was found to drive up hand compliance in a Greek hospital setting, although doubts were raised regarding the sustainability of this effect (Giannitsioti et al., 2009).

7.3.2 Job or task re-design

There may be potential in some environments for managers to re-design processes and routines in such a way that they improve compliance as well as increase efficiency. One way of driving up compliance is by decreasing the number of hygiene activities necessary. In the emergency department of a German hospital, the implementation of Standard Operating Procedures (SOPs) and introduction of flowcharts in combination with individual training sessions on the job was found to improve compliance significantly. The flowchart aimed at workflow optimization to improve efficiency and specifically reduce the number of hand rubs (HR) required in a working day. This was done mainly by decreasing the number of occasions requiring hand rubs (Scheithauer, Kamerseder et al., 2013).

Job re-design as an approach to compliance in FBOs is not explicitly addressed in the literature included in the current review so the feasibility of reducing the number of occasions where (for example) hand-washing is required in the course of food preparation, while maintaining acceptable hygiene standards cannot be readily inferred.

7.3.3 Safety promotion campaigns and other initiatives

A strategy that can be used to reinforce messages periodically is to have special ‘events’ where certain behaviours are promoted. Todd et al. (2010) described a ‘Hand Hygiene Week’ sponsored by management, during which food workers were reminded of correct hand hygiene procedures and were monitored for compliance. The authors suggested that incentive schemes can motivate

employees to follow correct procedures, such as presenting the employee with the best record of compliance during a particular day or week with a free meal at the restaurant.

There is a limited amount of evidence regarding the effectiveness of in-house deterrents to non-compliance (Gould and Drey, 2013). The use of 'violation letters' and designated hand hygiene liaison staff was trialled in a US hospital as a means of improving hand hygiene behaviour. Fearing retribution from violators, liaisons were initially reluctant to report noncompliant colleagues. Also many recipients of the letter, especially physicians expressed annoyance at receiving the letter and responded by reporting other noncompliant personnel. This was implemented as part of a 'bundle' of initiatives, so although non-compliances fell, the extent to which the letter was responsible is unclear (Chou et al., 2010). This type of bureaucratic intervention is arguably more practical to administer in a large organisation than a small FBO; notably food safety literature focuses on the threat of external sanctions as a deterrent to non-compliance.

With regards to the food sector. a US report advocated composing and communicating a food safety mission statement, a food safety budget, and the food safety responsibilities of employees. Messages that are compelling, rapid, relevant, reliable, repeated, multi-linguistic and culturally sensitive are thought to be the most effective (Jacob et al., 2010, cited in Powell et al., 2011).

In organisations sufficiently large, the tendency of employees to model their behaviour on that of peers and colleagues can be exploited. In a statewide hand hygiene programme in New South Wales, Australia, the engagement of local champions and leaders chosen by ward staff was promoted as one of the key aims of the intervention. The leaders were briefed by the project officer about their expected role in supporting the project, leading by example, promoting hand hygiene to their peers, and displaying posters with photographs of clinical leaders and a supportive message about the project in ward areas. The slogan 'Clean Hands Save Lives' (CHSL) and a distinctive logo were developed and a social marketing approach was used to promote the campaign which was aimed at the visiting public as well as staff. Posters targeting key facilitators of and barriers to hand hygiene were promoted in a strategy modelled on a successful WHO campaign (Fitzpatrick et al., 2009; Pantle et al., 2009).

Materials developed to support the objectives and key messages of the Australian CHSL campaign included T-shirts and balloons with the campaign logo, staff and patient information brochures, posters with 15 different messages and a website[7] Posters designed for hospital use were also provided to a television station to display on the set of a hospital-based drama so posters could be aired on episodes. Messages displayed by the campaign materials emphasised the ease of use and effectiveness of alcohol-based hand rub (AHR) in minimising spread of infection and dispelled myths about the spread of multiresistant organisms

[7] http://www.cec.health.nsw.gov.au/concluded-programs/clean_hands

(MROs). The materials provided a means of standardisation so that healthcare workers (HCWs) and patients received the same information and messages regardless of their location. The patient/visitor brochures were produced in hard copy in English and electronically in 22 languages. As a result of the campaign a 377 per cent increase was seen in the monthly hospital purchase of alcohol hand rub. It was felt that the subsequent implementation of a national campaign (the Hand Hygiene Australia programme[8]) would continue to strengthen the aims of the programme and 'drive the groundswell of change across the country' (Pantle et al., ibid).

7.3.4 Using multifaceted approaches in the health sector

Whether part of a campaign or a general communications strategy it is clear from the hand hygiene literature that using multiple sources of communication about risk and compliance is important. In a review of studies conducted in Europe, Ott and French (2009) noted that the majority of the hand hygiene initiatives include only an education session, and/or a poster or peer assessment and that these interventions are shown to be effective in the short term but lack sustainability. They suggested that multiple interventions or a multi-faceted approach to hand hygiene comprised the most effective approach to increasing compliance within a health care institution. Similarly, a recent international meta-analysis of food safety training (focussing on hand hygiene) concluded that a combination of standard training and behavioural interventions may be the most advantageous and practical approach (Soon et al., 2012). Also with respect to hand hygiene compliance, studies conducted in a German healthcare context (Scheithauer, Rosarius et al., 2013; Scheithauer et al., 2012) reported on successful application of various combinations of the following components:

- increased provision of disinfectant dispensers;
- increased direct observation;
- audits with feedback;
- and one-to-one training on the job.

Improvements supporting the benefits of multimodal approaches to hand hygiene have been reported in a range of countries (eg Mernelius et al., 2013). Roberts et al. (2012) described a range of activities that were successful in improving hand hygiene in an Australian healthcare context including:

- oral presentations undertaken at ward-based education sessions;
- an online learning package;
- development of themed posters, display boards, hand-outs and newsletters;

[8] http://www.hha.org.au/AboutHandHygiene.aspx

- participation in World Hand Hygiene Day (5th May);
- and ward compliance competitions.

Morgan et al. (2012) evaluated a range of techniques to drive up hand hygiene compliance coupled with a resource intensive approach to surveillance (338 hours of human observations and 424,628 electronic dispenser counts during the study period). Promotional materials consisted of colour posters displaying unit-specific monthly and quarterly hand hygiene compliance rates based on human observations and photos of unit staff performing hand hygiene. Together with a drive on education this was successful in achieving an increased number of dispenser counts during the post-intervention period versus pre-intervention trends in both units. Directly observed compliance however did not change significantly.

There is less information about the effects of using multifaceted approaches in the food sector. A US intervention designed to encourage: (i) perceived control over and (i) positive attitudes toward food safety was only partially successful in increasing safety knowledge and compliance among food service employees. In all analyses, post-training behavioural compliance was no better than the baseline. However, the addition of an intervention targeting barriers to food safety did improve overall compliance and compliance specifically with handwashing (both overall and doing so at appropriate times). Given the simplicity and low costs of the intervention, the authors suggested that it may worthwhile to implement such interventions in operations following food-safety training (York et al., 2009b).

8 Conclusions and recommendations

This final chapter discusses the extent to which reviewed evidence addresses the research questions underlying this work and builds on the information obtained from IES's previous, similar review of regulation cultures and behaviours in 2010. We also note some research gaps that persist. Finally, we present a number of recommendations for the FSA. As with the previous review these include suggestions for further research that could address gaps in the literature identified in the current review and some practical suggestions for future areas of research activity and policy development.

8.1 Main findings of the evidence review

Like the 2010 review this review has found very little empirical evidence making a direct link between particular aspects of culture and behaviour within dutyholders and regulators, and levels of compliance. There is a proliferation of descriptive information about approaches that appear to work well, but little in the way of controlled studies which prove the advantages of particular interventions or modifications objectively.

8.1.1 Research Question 1: Who does/does not comply and why?

The literature indicates that SMEs are less compliant than larger businesses across enforcement areas including food safety. Among smaller FBOs in particular, cost, time constraints and apathy can present barriers to compliance. Due to economies of scale the costs of compliance for SMEs can be substantially higher than in larger businesses and these costs (or perceptions of these costs) can deter compliance. These factors may be compounded by perceptions that compliance is burdensome or that an inspection system is unfair.

Particular types of smaller FBOs have been linked with a tendency to comply less; these include food takeaways, those whose staff receive very low pay and FBOs in areas where there is rapid 'churn' of businesses closing and opening**.** Size alone however is not always a useful predictor of compliance. The introduction of the Food Hygiene Rating Scheme and Food Hygiene Information Scheme (FHRS/FHIS) has shown that a large proportion of small FBOs are independently

able to achieve high ratings. Also, outside the food industry, the hospital hand hygiene literature suggests large organisations can struggle to meet hygiene standards too.

There is also a barrier to compliance when dutyholders do not perceive adherence to particular regulations as either necessary or desirable within their own company. This can result in a reluctance to learn about compliance in the first instance and ultimately non-compliance. Although the provision of formal training should improve levels of food hygiene, it is not clear whether improved knowledge translates into compliant behaviour, and when it does, how long this is sustained (see next Research Question below).

There is a clear consensus that a positive safety culture encourages compliant behaviour and greater adherence to relevant management systems which support compliance. However there are multiple definitions of safety culture (and not all are necessarily applicable to smaller FBOs) so it can be difficult to draw generalisations from the reviewed literature. Also, many studies discuss phenomena suggestive of a positive safety culture without using the term explicitly, adding to this difficulty.

Despite the complexity of the literature, it is possible to draw out some broad features of a positive safety culture. A key attitudinal factor is a sense of taking 'ownership' for food safety. A value system that prioritises avoidance of harm is an important feature, as are informed perceptions of and attitudes towards risk. Management commitment is another recurring theme. Staff at all levels, managers in particular, have a role to play in creating and maintaining a positive food safety culture. Practical elements include ensuring that effective risk management systems are in place, and that these are communicated clearly to all staff.

A negative safety culture has poor compliance with regulatory requirements and low perceptions of importance towards food safety in relation to other business priorities. Attitudes towards risk have a major influence on compliance since behaviours are often determined by individual judgements of risk rather than actual risk. This is linked to a perception that legislative requirements are largely irrelevant and that compliance will not actually improve safety standards. Also, if the potential consequences of foodborne hazards are not viewed as disastrous this can lead to difficulties in engaging staff on the importance of food safety.

In the food literature some recent studies have helped shed light on what different safety cultures look like by defining 'typologies' with respect to clusters of attitudes and behaviours demonstrated within FBOs. The typologies are linked to levels of compliance and/or sustained compliance. These illustrate a tendency, for example, for dutyholders who are only moderately compliant to approach compliance more passively than others and to see inspectors as guardians of public health, rather than themselves. In contrast there is a tendency for organisations who take more ownership of food safety to be more proactive and be more inclined to seek advice and information from enforcement professionals.

Involving workers in the design of risk control measures can be effective in encouraging their co-operation. This supports shared responsibility within work

places, potentially enabling workers to raise the alarm about safety risks or management flaws that might otherwise go unchecked.

8.1.2 Research Question 2: What approaches/communications are more/less effective in securing regulatory compliance?

The evidence review for the FSA on this topic four years ago found a lack of evidence about the types of organisational cultures within enforcing bodies that (do or do not) secure compliance. Some evidence has accumulated over the last four years that refers to this, however as reported in 2010 the impact of different ways of working within regulatory units cannot be determined. Nevertheless the FSA's own evidence suggests that good communication within food safety enforcing teams improves individual decision making and aids internal consistency with regard to enforcement approach. It also appears that situational aspects of the job such as an open office layout can encourage interaction and facilitate a team approach.

There is agreement within relevant literature that enforcement strategies should be responsive to the prevailing culture within food businesses; there is no 'one size fits all' strategy to secure compliance. Typologies classifying FBOs according to their behaviours and attitudes have the potential to be of practical use in assessing safety culture and guiding enforcement activities. The inclusion of 'confidence in management' (CIM) as an official risk category has been welcomed by many enforcers for the opportunity it provides to look beyond the most evident displays of compliance towards what they viewed as a better indication of a compliant mindset and an ability to sustain compliant behaviour.

The provision of advice and education are seen as key elements of the inspector role and the application of enforcement measures represents only one aspect. Visits to FBO premises can serve a number of purposes and take a number of different forms. For example, the value of 'pop-in' visits was emphasised by enforcers with respect to fostering ongoing dialogue and engagement with local businesses about food safety issues. Regular but brief visits of this type were also said to be particularly useful in ensuring passive and reactive FBOs sustained their levels of compliance.

LA food safety enforcers are sensitive to commercial concerns and the desire to help local businesses remain in operation where safe to do so. However there is a belief that many improvements that non-compliant businesses implement in response to enforcement action are not sustained. The Food Hygiene Rating Scheme and Food Hygiene Information Scheme (FHRS/FHIS) has been welcomed by enforcers as an approach to improving standards. There is widespread agreement that the implementation of the schemes has driven up standards although to date there is no hard data available that categorically proves cause and effect.

With regard to the schemes, there is confidence that scoring consistency within LAs is at an acceptable level. However evidence suggests that across different LAs consistency can be problematic and training in this area is seen as valuable.

The international literature highlights a need to keep training materials up to date with respect to new food technologies and food preparation techniques.

Budgetary constraints within local government could affect the way food safety enforcers work currently, or in the future. There is some concern surrounding increasing pressures on LA enforcers to adopt additional regulatory roles (eg health and safety, trading standards) outside their food safety specialisation; a worry is that this may have a negative impact on time they can allocate to food safety enforcement.

8.1.3 Research Question 3: What encourages sustained compliance?

The research that explicitly focused on sustained compliance focused on three main areas: supervision, training and monitoring, with respect to activities of that type that are principally provided by the employer.

Knowing how to comply is an important first step towards compliance but is not a guarantee of it, and recall of training content can falter over time. The duration over which training has an impact is uncertain and regular updates are often needed to ensure compliance is sustained.

In terms of influences on compliance within businesses, the role of managers and supervisors in encouraging and motivating employees to follow proper practices is critical. This includes indirect as well as direct influences: employees will pay attention to the actions of managers as well as instructions they are given more explicitly and 'role modelling' desirable behaviours is therefore important.

In the absence of formal training, workers depend on their managers and colleagues to communicate information about compliance to them in a manner that is understandable and persuasive. 'Role models' who demonstrate compliant behaviours can positively influence the behaviour of junior staff in catering organisations. This also applied to health and safety behaviours in other sectors such as construction. However studies suggest that in some hospital settings consultants fail to set a positive example to other, more junior staff with respect to hand hygiene.

Barriers to compliance need to be understood fully in the design of training and other interventions; the Theory of Planned Behaviour offers a useful framework for this approach. Barriers and negative attitudes can then be targeted in educational interventions to improve behavioural intent. Managers and supervisors should emphasise the positive outcomes of hand washing (e.g., safe food, less recall, and more profit for the company and workers) and potential negative outcomes (e.g., foodborne illnesses, product recall and lost business or bankruptcy). Developing materials that guide dutyholders through the processes in ways that conserve time and cost can also help overcome perceived barriers to compliance.

Training needs to be affordable, practical and suitable for the environment in which it will be applied. Simplicity and relevance to job tasks undertaken are also key requirements. Information should be task specific and learners should not be overburdened with irrelevant information. Addressing language barriers is critical.

Use of graphics and supplementary materials is advocated with non-English speaking workers who may not have fully understood the original training content.

Compliant worker behaviour appears best reinforced via the use of multiple channels of feedback, including management communication combined with feedback on performance levels. Hand hygiene in particular is viewed as a complicated behaviour and appears to benefit from a multifaceted approach to feedback provision. Ideally, training interventions should be closely followed by communication and feedback.

In healthcare hand washing appears to be highly influenced by the presence of other members of staff (or member of the public) who may be observing. In hospitals electronic devices have been successfully employed to monitor hand hygiene compliance, while in food processing plants CCTV has been used. However these approaches may not be practical or affordable for small FBOs. Regarding hand hygiene specifically it has been suggested that FBO managers could monitor the use of soap and paper towels. The amount of these items consumed would provide some indication of handwashing behaviour over a particular period.

Supervisors and managers should create an environment that cultivates compliant behaviour by putting up posters and reminders (in the workers' native languages) and continually model desirable behaviour themselves. Visual material should be hard hitting and the placement and prominence of signs should be fully considered in relation to the environment in which targeted activities are routinely undertaken.

8.1.4 Research Question 4: What incentives and deterrents have been shown to achieve and maintain compliant behaviour, and what more can business bodies and enforcement agencies do to improve their position?

Evidence suggests that commercial concerns are of increasing importance in terms of incentivising food safety as well as other regulations such as health and safety. This applies in the context of international food trading as well as chains of supply based wholly within the UK. For example many food producers and manufacturers are required to meet regulatory requirements such as ISO 22000 and HACCP in order to participate in markets that trade across international boundaries.

Recent evidence suggests that commercial interests can drive compliance in smaller as well as larger businesses. Findings emerging from the evaluation of the Food Hygiene Ratings Scheme and Food Hygiene Information Scheme(FHRS/FHIS) are consistent with this and the scheme has also been welcomed by enforcers as an approach to improving standards. Available evidence suggests that the majority of businesses view it as important to have a rating inspection result that was higher than other businesses in their area. Also, there is widespread agreement that the implementation of the schemes has driven up compliance although to date there is no hard data available that categorically proves cause and effect. The scheme is not likely to be a catch-all remedy

however, especially where resistance to compliance is entrenched. Among inspectors there is a view that there are a core group of low performing food business operators who will not implement positive changes without a revisit as a deterrent.

At a within-company level, incentive schemes which award prizes for best compliance over a particular period can also motivate employees. Promotions such as 'Hand Hygiene Week' could be used in conjunction with monitoring to facilitate this, although monitoring may be impractical within smaller FBOs, due to resource limitations. Also the awarding of prizes within very small workforces or family businesses may be inappropriate.

Lessons can potentially be learned from the healthcare context where it has been advised that emphasis should be placed on clinicians' moral and ethical obligations with respect to hand hygiene compliance, as part of training and orientation. Food handlers should be constantly reminded of their crucial role in ensuring safe food for consumers because they are the food service-customer interface.

8.2 Recommendations for further research

On the basis of the reviewed evidence a number of areas for targeting future food safety research and policy development are suggested.

8.2.1 Ensure future studies consider compliance as an outcome

Like the 2010 review this review has found very little empirical evidence making a direct link between particular aspects of culture and behaviour within dutyholders and regulators, and levels of compliance. There is a proliferation of descriptive information about approaches that appear to work well, but little in the way of controlled studies which prove the advantages of particular interventions or modifications objectively.

One difficulty in establishing effectiveness of various approaches on compliance is that this requires observations of actual behaviour, ideally when workers or managers do not know they are being watched (when they are susceptible to 'Hawthorne effect' phenomena). CCTV offers one approach to monitoring but there appears to be only limited use of this in food hygiene research, possibly because of the resource-intensiveness of analysing the data it yields.

More research which analyses dutyholder behaviour as an outcome is desirable. Some innovative indicators of compliant behaviour have been applied in relation to hand hygiene behaviours (such as monitoring consumption of soap, paper towels. etc). Innovative methods which allow objective study of other aspects of food safety-related activities (such as when cooking, handling and storing foods) could facilitate more research studies that look at wider aspects of FBO practice. In order to properly investigate the cultures and behaviours which lead to compliance, future studies should include indicators of compliance as principal

outcome measures. Independent judgements of compliance should be obtained for this purpose (ie not from employees' own assessment of their performance).

In order to identify factors that lead to sustained compliance, future studies would need to include a longitudinal component. This would necessitate monitoring compliance over a substantial time period and, although this is a resource-intensive approach, it would go some way to improving on the current evidence base.

8.2.2 Continue to examine first-hand experience of enforcers

In the previous review for the FSA a major barrier to addressing several of the central research questions was the lack of evidence detailing cultures and behaviours with regard to LA regulatory activity. Several pieces of work commissioned by the FSA (along with another small amount of academic literature) have since gone some way to addressing this gap. It is envisaged that the final report of the FHRS/FHIS evaluation will contain further qualitative and quantitative evidence about inspector activities and decision making. This is essential in establishing 'what works' regarding cultural and behavioural aspects of enforcement: it is particularly important to have up-to-date information about this in the context of the new ratings scheme which is likely to have knock-on effects for all aspects of enforcement in the food sector premises it applies to.

Another area where evidence is currently lacking concerns the reported increasing pressures on LA enforcers to adopt additional regulatory roles (eg. health and safety, trading standards) outside their food safety specialisation; a worry is that this may have a negative impact on time they can allocate to food safety enforcement. Although the full impact of these reported trends is not likely to be seen for some time, this is an important issue to monitor. The LAEMs database which was not within the search remit of this review may be informative in this respect.

The small but high quality evidence base which this review identified on the enforcement cultures and behaviours was valuable to this review and allowed a more thorough examination of the role of these factors in achieving compliance than was possible in the review conducted four years ago. In particular it is evident that in a changing regulatory context (ie compulsory display of FHRS ratings in Wales) this type of knowledge continually needs updating.

8.2.3 Consider applicability of findings from outside food industry carefully and purposefully target any new evidence search towards sectors/enforcement regimes with known similarities to food and food safety

While this review has aimed to draw on material from a range of regulatory contexts, two main areas dominate in the literature identified outside the food industry, namely hospital hand hygiene and health and safety.

The apparent recent proliferation of hand hygiene literature appears to be a knock-on effect from high-profile campaign led by the World Health Organisation. This was launched in 2009, ie between this review and the last one. Although this evidence base has yielded findings that are acceptably relevant to the main research questions, there are marked differences in the organisational cultures of hospitals and food businesses and it is arguably not always appropriate to transfer knowledge from the healthcare sector to food safety. The size and hierarchical nature of most healthcare settings differs radically from smaller food businesses, also the nature and scale of the risks are very different, not least due to the physical vulnerability of members of the public who are present in that environment. The impact of these contextual differences on hygiene practices is a potential avenue to explore in research.

Fewer relevant HSE reports were identified than expected in the literature search (even when the relatively narrow time frame criterion for the current report is considered). This may result from a scaling down of its research outputs in some policy areas in recent years. There is a strong focus in construction in many of the identified reports, an industry where many (although not all) safety risks are visible, and usually of direct consequence to the wellbeing of the worker and their colleagues. Many of the drivers are for compliance are therefore of a different nature from those associated with food safety; as a consequence, the focus of training and other interventions designed to improve compliance has a different emphasis. This does not preclude knowledge transfer however, particularly in regard to construction safety measures which are designed to protect the wellbeing of the general public on or around the worksite. It could therefore be helpful to clarify the scenarios where the latter is the case and explore any potential lessons for food hygiene.

8.3 Policy recommendations

8.3.1 Consider exploiting supply chain influences

Work in the area of health and safety has explored the main ways existing relationships within supply chains can be exploited to disseminate good practice. The scope to do this is bound by the prevailing cultures within a particular sector or supply chain, so a good understanding of mechanisms by which FBOs conduct business (details of which lie outside the remit of this review) would be essential for formulating policy in this area. Some strategies that have been used in the construction sector centre on the supply of equipment and materials and ensuring that compliance-related information is supplied at the point of purchase or hire. There may be scope for this type of approach to be used with respect to suppliers to FBOs; approaches analogous to those used in the construction industry could possibly involve the provision of food safety and hygiene information with products and equipment used in food preparation (it should be noted however the review did not find research that explored this idea in the food sector).

8.3.2 Adopt proven ‘shock tactics’ to influence behaviour

The recent WHO hand hygiene campaigns have inspired a number of high profile campaigns around the world to improve practice in this area within healthcare. The use of slogans and materials that emphasise potential loss of life have been used extensively in this context. While food safety risks are different, in term of both risk type and risk control (eg the primary pathogen of concern in hospitals is norovirus against which alcohol hand rubs are an effective measure; this is not the case for most foodborne pathogens) some of the ‘shock tactics’ and hard-hitting visual material which highlight the potential human costs of non-compliance may be applicable for use in kitchens (and possibly bathrooms) in FBO premises. Evidence suggesting that workers respond more strongly to qualitative descriptions of potential harm than statistics (about sickness or fatalities) should also be considered.

8.3.3 Consider that high FHRS/FHIS ratings may not signify that a satisfactory safety culture is in place

This review found evidence originating outside the UK that raw inspection scores can be poor predictors of foodborne illness, although no UK data was found which shed further light on this. This current review did find however that UK enforcement personnel tend to take an approach with a much broader definition of success than improved compliance ratings and look for (often subtle) qualitative indicators such as shifts in FBO mindsets and evidence that food safety messages have been understood. This would appear to be an important area for policymakers to bear in mind when considering the extent to which high-rating establishments merit continued attention from food safety inspectors. On the basis of the reviewed evidence it would appear that systems of scoring used in inspections (particularly those that focus on aspects of safety culture identified in Chapter 6 such as ‘compliant will’ and ‘ownership of compliance’) could potentially identify areas where advice/intervention is required even where awarded FHRS/FHIS ratings are high.

8.3.4 Explore the utility of using caricatures and ‘typologies’ of businesses in guidance for enforcers

Classification systems for dutyholders have been developed in recent research projects conducted for the FSA which describe FBOs as, for example, ‘amoral calculators’ (Wright et al, 2012) or ‘disinterested’ (Bukowski et al, 2012). These terms are intended to reflect the standard of aspects of food safety culture within particular organisations. These classifications or ‘typologies’ may be directly applicable in the context of inspections; for example food businesses meeting criteria for the above (negative) safety culture descriptors could be targeted for particular interventions or forms of enforcement action. This recommendation ties in with the one above with respect to the importance of using safety culture criteria that go beyond ‘raw scores’.

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Appendix 1: Search terms used and results of search process

Table A1.1: Search terms applied to academic databases

Primary	Secondary
Compliance	"food safety" OR "safety legislation" OR “hygiene”
Enforcement	"food safety" OR "safety legislation" OR “hygiene”
Communication	"food safety" OR "safety legislation" OR “hygiene”
Support	"food safety" OR "safety legislation" OR “hygiene”
Behaviour OR Behavior	"food safety" OR "safety legislation" OR “hygiene”
Culture	"food safety" OR "safety legislation" OR “hygiene”
Attitudes	"food safety" OR "safety legislation" OR “hygiene”
Safety	"food safety" OR "safety legislation" OR “hygiene”
Hygiene	"food safety" OR "safety legislation" OR “hygiene”

Table A1.2: Search results obtained from academic databases

Database	Limits used	Total N
ASSIA	Title	19
	2009 onwards	
	English	
EMBASE	Title	87
	2009 onwards	
	English	
	Human	
INGENTA*	Title	1037
JSTOR*	Title	52
	Article, review or editorial	
	2009 onwards	
	English	
PsycInfo	Title	26
	2009 onwards	
	English	
	Human	
Sage Online	Title	43
	2009 onwards	
	English	
Science Direct	Title	869
	2009 onwards	
	English	
Web of Science	Title	2058
	2009 onwards	
	English	

Appendix 2: Search strategy and results for HSE database search

Table A2.1: Search results obtained from HSE database

* Searches undertaken 'anywhere on page' as all 'title only' searches yielded zero hits.

Primary		Secondary	All HSE websites. Anywhere on page	All HSE websites. Limited to title only	Refined to: Publications database. Anywhere on page	Refined to: Publications database. Limited to title only	Refined to Research database. Anywhere on page*	Refined to Research database. Limited to title only	Number obtained from sift
Compliance	AND	"food safety"	636	0	0	0	66	0	
Compliance	AND	"safety legislation"	2040	0	0	0	271	0	
Compliance	AND	hygiene	1150	0	0	0	224	0	
Enforcement	AND	"food safety"	838	0	0	0	66	0	
Enforcement	AND	"safety legislation"	2230	0	0	0	215	0	
Enforcement	AND	hygiene	1030	0	0	0	164	0	
Communication	AND	"food safety"	362	0	0	0	70	0	
Communication	AND	"safety legislation"	965	0	2	0	265	0	
Communication	AND	hygiene	908	0	0	0	270	0	
Support	AND	"food safety"	905	0	0	0	69	0	
Support	AND	"safety legislation"	348	0	0	0	295	0	
Support	AND	hygiene	390	0	0	0	390	0	10
Behavio(u)r	AND	"food safety"	338	0	0	0	65	0	
Behavio(u)r	AND	"safety legislation"	623	0	0	0	223	0	
Behavio(u)r	AND	hygiene	676	0	0	0	249	0	
Culture	AND	"food safety"	210	0	0	0	64	0	
Culture	AND	"safety legislation"	717	0	0	0	222	0	
Culture	AND	hygiene	519	0	0	0	175	0	
Attitudes	AND	"food safety"	125	0	0	0	61	0	1
Attitudes	AND	"safety legislation"	452	0	0	0	201	0	
Attitudes	AND	hygiene	395	0	0	0	187	0	6
Safety	AND	"safety legislation"	3084	0	0	0	333	0	8
Safety	AND	hygiene	3120	0	0	0	482	0	1
Hygiene	AND	"safety legislation"	347	0	0	0	104	0	
l hits (including duplicates)			22408	0	2	0	4731	0	
owing sift (including duplicates)							26		26
owing sift (excluding duplicates)							15		15

Appendix 3: Criteria for initial sift

Academic literature

Sift of documents identified through literature search should elicit a positive response to **all of criteria 1 and 2 AND to at least one of criteria 3 and 4.**
(* denotes criteria not made explicit in 2009 review but added here for clarification)

1. a) Is the research publication date 2009 onwards?
   b) Is the document text in English?
   c) Has the work been conducted within an OECD country?*
   d) Does the work consider the behaviour of adults in employment/job-based training (ie those 16 and above) at a place of work (ie not activities within their own home)?*
   e) *If food safety is the focus of the work*, does the study consider workers preparing food for consumption by consumers (ie not for themselves/their families)?*

2. Is the article reporting on research?
   Exclude comment and opinion items.
   Exclude case studies which are purely descriptive or exploratory; consider inclusion of case studies only where they are explanatory in nature, ie where the study presents data having some bearing on cause-effect relationships.

3. Does the article address factors influencing one or more of the following:
   regulatory compliance
   enforcement of legislation
   "safety culture"
   "safety climate"*
   "regulation culture"
   "regulation behaviour"

4. Are the issues that are discussed or investigated *of relevance to the current review?*
   Papers of relevance would address:

   - Who does/does not comply and why?
   - What approaches are more/less effective in securing regulatory compliance?

(eg, incentives such as award schemes, penalties such as fines)
■ What encourages sustained compliance?

■ Modes of communication which are effective in securing regulatory compliance;
This could refer to communications
- within the dutyholding organisation (eg, between managers and employees)
- between the enforcing authority and the dutyholding organisation
- within (ie, between different elements of) the enforcing authority
- across enforcement boundaries (ie, between one enforcing authority and another).

■ Attitudes which affect regulatory compliance*
This could refer to attitudes
- held within the dutyholding organisation (by employees, managers)
- held within the enforcing authority.

Grey literature

Sift of grey literature sent by the FSA or identified through literature search or designated experts1 should elicit a positive response to **at least one of criteria 3 and 4 described above**.

A similar approach should be taken to exclude case studies: ie exclude those which are purely descriptive or exploratory; consider inclusion of case studies only where they are explanatory in nature, ie where the study presents data having some bearing on cause-effect relationship.

Appendix 4: Review proforma

This form (based on a proforma used in previous FSA review[9] [10]), is to be used after using the sift proforma
Sections 2, 3,4 should be used to guide completion of section 5 (article summary)

1.Document classification

1.1 Article type:

Please check box as appropriate

Academic article	☐	**Grey literature**	☐

1.2 Article sub-type:
Please check box as appropriate

Academic articles		**Grey literature**	
Quantitative research	☐	Report	☐
Qualitative research	☐	Case study	☐
Evidence/literature review	☐	Other – specify:	☐

[9] http://www.food.gov.uk/science/research/ssres/crosscutss/ssculturereview

[10] Note that to aid efficiency, documents were reviewed using an Excel spreadsheet which presented these items in matrix format (with drop down menus and free text boxes)

Other – specify:	☐		

"case study", or "other", please go straight to section 4
in all other cases proceed to section 3

2.Intervention type

Please check box as appropriate and comment, where appropriate, on "not" responses in the article summary

Describes intervention	☐	**Does not describe intervention**	☐

3. Methodological quality

3.1 All studies:
Please check box as appropriate

Peer-reviewed journal article	☐	Approved by gov't body or NGO	☐	Neither (please state) *	☐

3.2 Quantitative studies only:

Please check box in right hand column and elaborate, where relevant, in the article summary

	Yes	No	NA
3.2.1 Is there evidence of:			
selection bias? if "yes" please comment in summary whether this is	☐	☐	☐
performance bias? if "yes" please comment in summary whether this is	☐	☐	☐
attrition bias? if "yes" please comment in summary whether this is	☐	☐	☐
3.2.2 Have the following details of the study been reported:			
design?	☐	☐	☐
methods?	☐	☐	☐
participants?	☐	☐	☐

interventions?	☐	☐	☐
outcomes?	☐	☐	☐
3.2.3 Are the experimental and control groups truly comparable	☐	☐	☐
3.2.4 Have appropriate statistics been used in the analysis of data?	☐	☐	☐
3.2.5 Have the appropriate statistics been fully reported	☐	☐	☐
3.2.6 Are there any missing data that need to be gathered/followed-up?	☐	☐	☐
3.2.7 Do the findings and analysis support the author's conclusions?	☐	☐	☐
3.2.8 Are there any other concerns about the way the study was carried out? (Please highlight these in the article summary)	☐	☐	☐

3.3 Qualitative studies only:

Please check box in right hand column and comment, where appropriate, on "No" responses in the article summary

	Yes	**No**	**NA**
3.3.1 Are the underlying assumptions of this study clear?	☐	☐	☐
3.3.2 Has the research design of this study been justified?	☐	☐	☐
3.3.3 Are the following presented in the study			
sample design?	☐	☐	☐
case selection?	☐	☐	☐
analytical approach?	☐	☐	☐
attrition bias	☐	☐	☐
documents used?	☐	☐	☐
3.3.4 Have any reasons for non-participation of subjects been made clear?	☐	☐	☐
3.3.5 Have the data collection procedures been made explicit?	☐	☐	☐

3.4. Reviews only:

Please check box in right hand column and comment, where appropriate, on "No" responses in the article summary

	Yes	No	NA
3.4.1 Is the review methodology clear?	☐	☐	☐

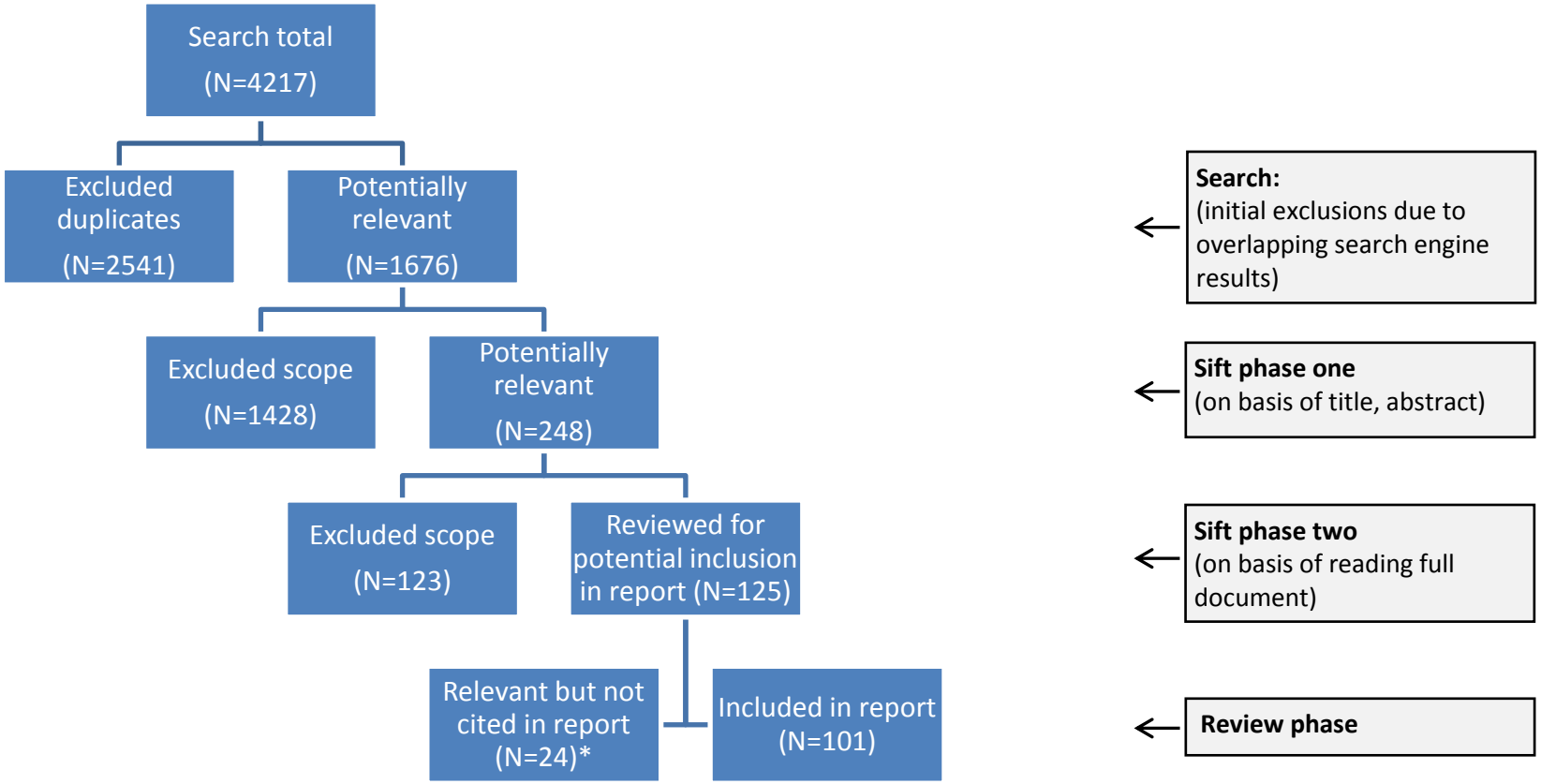
4. Recording findings for inclusion in review

Please use table below to guide data extraction and aid completion of article summary sheet in Section 4(topics in left hand column are suitable for use as headings)

	YES	NO
4.1 Does the study address any of the following factors within the dutyholding organisation and their influence on compliance?		
4.1.1 Size/nature of business/position in supply chain/ membership of trade association and/or accreditation schemes of the dutyholding organisation? *If "yes" please record details in article summary*	☐	☐
4.1.2 Behaviours/attitudes within the dutyholding organisation *If "yes" please record details in article summary*	☐	☐
4.1.3 Safety culture within the dutyholding organisation? *If "yes" please record details in article summary*	☐	☐
4.1.4 Modes of communication within the dutyholding organisation *If "yes" please record details in article summary*	☐	☐
4.1.5 Other within organisation factors (please state) *If "yes" please record details in article summary*	☐	☐
4.2 Does the study address any of the following factors within the enforcing body and their influence on compliance?		
4.2.1 Organisational characteristics of the enforcing body *If "yes" please record details in article summary*	☐	☐
4.2.2 Behaviours/attitudes within the enforcing body *If "yes" please record details in article summary*	☐	☐
4.2.3 Enforcement approach of the enforcing body? *If "yes" please record details in article summary*	☐	☐
4.2.4 Organisational culture within the enforcing body *If "yes" please record details in article summary*	☐	☐
4.2.5 Modes of communication within the enforcing body *If "yes" please record details in article summary*	☐	☐
4.2.6 Other factors within the enforcing body (please state) *If "yes" please record details in article summary*	☐	☐
4.3 Does the study address any of the following factors with respect to interaction of the enforcing body with other parties?		

	YES	NO
4.3.1 Modes of communication between the enforcing body and the dutyholder? This can include inspections (and communication style used), letters, training offered, marketing campaigns and award schemes (such as Scores On The Doors) *If "yes" please record details in article summary*	☐	☐
4.3.2 Approach to working across enforcement boundaries and with other enforcing bodies? *If "yes" please record details in article summary*	☐	☐
4.3.4 Other factors with respect to interaction of the enforcing body with other parties *If "yes" please record details in article summary*	☐	☐
4.4 Does the study address any other factors not covered above which have a bearing on the current review? *If "yes" please record details in article summary*	☐	☐
4.5 Any recommendations regarding measures to improve compliance and/or associated attitudes, behaviour or communication *If "yes" please record details in article summary*	☐	☐

Appendix 5: Documents included and excluded



*28 articles were of relevant and of sufficient quality to be reviewed but were not cited in the text of this review. In these cases there were other (more relevant) articles which better illustrated the arguments being made.

Appendix 6: Categorisation of included documents

Document type (number of documents)			
Academic articles	83	Grey literature	18

Subject area (number of documents)			
Food-related	48	Non food-related	53

Methodology (number of documents)							
Quantitative only	59	Qualitative only	25	Literature review only	7	Mixed methods	10