# Small food businesses' proposed alternative controls to the separate use of complex equipment, to control the risk from *E. coli* O157

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# Executive Summary

## 1. Aims

The overall objective of this study (which is part one of a two part investigation) was to identify alternative controls of *E. coli* O157, which can be as effective in controlling the risk from *E. coli* O157 as the separate use of complex equipment, as recommended in the Food Standards Agency cross-contamination guidance[1]. Potentially viable alternatives were to be assessed for suitability in being taken forward for testing at stage 2 of the study which will scientifically test in a laboratory setting whether proposed alternative controls are indeed equally effective.

## 2. Methods

Three core phases of research were proposed:

- **Phase 1**: telephone interviews with 30 interested parties (industry members and trade bodies) and 10 Environmental Health Officers (EHOs) to identify 'alternative' control measures and assess their effectiveness in preventing cross-contamination risks.
- **Phase 2**: quantitative telephone survey with 401 small and micro food businesses to identify current practices in relation to the use of complex equipment and alternative practices to non-dual use.
- **Phase 3**: Four case studies of 'alternative' controls in practice, undertaken at food businesses premises.

## 3. Findings

### 3.1 Phase 1 – Interested Parties and EHOs Perspectives

There were a wide range of views expressed in relation to FSA advice on *E. coli* O157 cross-contamination and on the recommendation for the complete separation / separate use of complex equipment used for preparing raw and ready-to-eat (RTE) foods. These views ranged from supporting the guidance and its content as being the only safe approach, through to the advice within the guidance being 'impractical', burdensome and without scientific justification, and finally those expressing mixed views; agreeing with the sentiment of the guidance, but overzealous in its approach.

[1] http://www.food.gov.uk/business-industry/guidancenotes/hygguid/ecoliguide

Few alternative controls were reported by Stakeholders, and few were cited as being used in practice, other than manual cleaning using chemicals.

Perceived 'alternative' controls that were cited included:

- Stripping machines down and using either steam or boiling water to clean;
- Timed separation – using equipment at different times separated by strict steam or very hot water clean;
- 'Safe barriers' with reference to weighing scales; and
- Sanitised wipes for temperature probes.

**Chemical cleaning** – A number of the stakeholders insisted that chemical cleaning represented a safe and viable alternative for businesses. However, most did appreciate that any reliance on 'process' necessarily introduced an element of human risk, and some felt that you can never remove human error, even from separation, and that the argument against chemical cleaning is inconsistent. The FSA's evidence shows that procedural controls, and therefore effectiveness of chemical cleaning can brake down during busy environments.

**Complexity of equipment** - Many stakeholders suggested that certain pieces of equipment should not be considered as 'complex' and could effectively be cleaned through regular cleaning and sterilisation. While respondents accepted that for certain complex equipment there was unlikely to be a reliable alternative, the situation was perceived to be different for other items such as temperature probes, scales, mixers and some vacuum packing models which stakeholders said could be cleaned effectively either through manual cleaning or a dishwasher.
Some respondents also questioned the need for separation citing that there was not a perceived risk in the first place; referencing a report that certain vacuum packing models do not pose a cross-contamination risk if handled and managed effectively.

**Education and training** - The point was also made that, by focusing almost exclusively on separation and trying to remove human risk will have the potential to backfire as there is subsequently less focus on training, support and communication which stakeholders thought was as, or more, important than separation itself. Tied to this view was the belief that as there is no perfect solution, the main focus needs to be on education, training and support to ensure that risks are minimised.

### 3.2 Phase 2 - Food Business Practices

***Dual Use***

All 401 surveyed food businesses used complex equipment at their site, ranging from 1 to 8 pieces of equipment. Dual use of equipment was not widespread as can be seen in the Table below. Just 2% of food businesses used their vacuum packers

or slicers for both raw and RTE food. Dual use was most common in relation to temperature probes and overwrapping machines at 9% and 11% respectively.

**Equipment used for both raw and ready-to-eat foods**

| | N | % | Base |
|---|---|---|---|
| Vacuum packer | 2 | 2 | 130 |
| Slicer | 3 | 2 | 207 |
| Mincer | 0 | 0 | 133 |
| Mixer or food processor | 16 | 8 | 197 |
| Weighing Scales | 27 | 8 | 342 |
| Overwrapping machine | 13 | 11 | 116 |
| Temperature probe | 36 | 9 | 397 |
| Sausage machine | 0 | 0 | 15 |
| Other complex equipment | 2 | 5 | 41 |

Q:C2 *Do you ever use the same single [piece of equipment] for both raw and ready-to-eat foods? Multiple response option*

***Reasons for dual use***

Businesses primarily believed that dual use of equipment was more efficient or that it was too difficult to separate (due to space? Or cost?). Businesses also justified dual use on the grounds that they cleaned their equipment between uses.

***Methods used to clean dual use equipment***

A variety of methods were used by businesses to clean and disinfect dual use equipment. For all equipment, the most commonly used methods and products included: detergents; disinfectants; sanitisers; hot water above 80$^{o}$C; disposable cloths; or use of a dishwasher. Less widely used methods and products included: dishwasher combined with chemical disinfectant; ozone cleaning; steam cleaning; and plasma cleaning.

Food businesses also deployed other controls to prevent *E. coli* O157 cross contamination. These included: a range of methods to ensure clean hands such as single use towels or hand driers; NHS approved hand washing techniques; disposable gloves; separate washing basins; and non-hand-operable taps. Apart from hand protection the other most commonly used controls included: HACCP plans (95%); clean-as-you-go (96%); tongs and other utensils for handling food (92%); and protective clothing (88%). Although less common, time and space separation approaches were also practiced by around three fifths of food businesses - specifically: handling raw and RTE foods at different times of the day (62%) and separation of staff handling raw and RTE foods (61%).

### 3.3 Phase 3 – Case Studies

Techniques described by businesses which may constitute viable 'alternative' controls, followed up at the case study stage, included the following cleaning approaches. In relation to mixers, vacuum packers, over-wrappers, scales and slicers which can be dismantled, businesses proposed safe alternatives using the following stages:

- Hands washed prior to cleaning
- Disassembly of equipment
- Removal of food debris using single use sanitised cloths
- Parts of the equipment which come into direct contact with food submerged into hot water to vigorously rub in order to remove food debris
- Heat disinfection stage – used a dishwasher at a temperature of 60 degrees or higher OR
- Chemical disinfection – either submerged parts in a recommended dilution of liquid disinfection for a recommended period of time or sprayed with a sanitiser / disinfectant (some are designed to be left on, others to be wiped off after a recommended period of time)
- Drying stage – air drying, paper towels, or single use tea towels
- Parts which could not be submerged in water for cleaning and which did not come into direct contact with food were wiped or sprayed with sanitisers / disinfectants.

In relation to temperature probes, businesses proposed safe alternatives using a selection of the following stages:

- After use, wiped with sanitiser / antibacterial wipes or
- Placed in boiling water and cleaned with detergent, then
- Wiped again or sprayed with sanitiser or allowed to sit in liquid sanitiser for recommended period of time, before
- Drying techniques – air dried, use of paper towel or wiped with single use tea towel, and finally
- Sanitised again immediately before next use

Businesses recommended for the case studies used these stages with various degrees of rigour in practice. Human error remains a possibility however. If each of these stages is followed carefully they may represent a safe 'alternative' approach to complete separation and therefore warrant testing in a laboratory setting to determine how appropriate they are. They are therefore recommended for stage 2.

Overall, few alternatives were suggested by businesses, and little scientific evidence was provided in support for alternatives which were suggested. However, given stakeholder feedback, the FSA are advised to test alternatives being considered by food businesses to determine their effectiveness. Tests can assess whether certain pieces of equipment pose a risk and whether manual cleaning can adequately control the risks from *E. coli* O157.

# 1. Background, objectives and method

## 1.1 Background

Following *Escherichia coli* (*E. coli)* O157 outbreaks in Scotland (1996) and Wales (2005), a public inquiry was chaired by Professor Sir Hugh Pennington and published in 2009. The FSA responded by establishing a programme of work to reduce the risk of such outbreaks occurring in the future - the Food Hygiene Delivery Programme (FHDP). One aspect of the FHDP was the introduction of new guidance to increase recognition of the threat that *E. coli* O157 poses to public health and the need for stringent measures to control the cross-contamination risks. This guidance included a recommendation for the complete separation / separate use of complex equipment[2] used for preparing raw and ready-to-eat (RTE) foods.

An evaluation of this guidance was carried out in 2012 (Smeaton et al, 2012) which revealed some concern from industry stakeholders and Environmental Health Officers (EHOs) that small food businesses have been struggling to comply with the recommendation of complete separation of complex equipment.

In 2012 the Government's Focus on Enforcement campaign in England asked small food manufacturers to report on their experiences of working with national regulators and local authorities as part of a review. The review was aimed at micro and small food businesses employing up to 50 employees and raised concerns about the *E. coli* O157 cross-contamination guidance, in particular the use of separate complex equipment as a control measure (BIS, 2012).

Following concerns raised by small businesses, the FSA agreed to investigate whether alternative controls to cross-contamination might be viable. The FSA remains committed, at present, to the position that the dual use of complex equipment for raw and RTE food cannot be regarded as safe practice. However the FSA will identify and independently test alternative controls to cross-contamination proposed by stakeholders or businesses.

2 Complex equipment includes: vacuum packers, slicers, mincers, mixers and food processors, weighing scales, temperature probes and overwrapping machines.

## 1.2 Aims objectives

The overall objective of this study (which is part one of a two part investigation) was to identify and evaluate alternative controls of *E. coli* O157, as proposed by small businesses, trade bodies, and environmental health officers, which can be as effective in controlling the risk from *E. coli* O157 as the separate use of complex equipment.

The aims of the research were therefore threefold:

a) to identify alternative controls to the separate use of complex equipment as proposed by small businesses and other stakeholders;
b) to outline clearly the rationale for and evidence in support of the proposed alternatives, including a clear indication of how the alternative control would be effective in controlling the risk from *E. coli* O157; and
c) to assess and evaluate whether these alternative controls are suitable to be taken forward for testing at stage 2 of the study (the stage 2 investigation is beyond the remit of this study but will scientifically test in a laboratory setting whether proposed alternative controls are indeed equally effective).

Specific research questions arising from these broad objectives included:

- What range of complex equipment is used (e.g.: vacuum packers, slicers, mincers)?
- How is each piece of complex equipment used – specifically whether single or dual purpose?
- In each instance of non-separation (i.e. dual use) what methods are used for cleaning and preventing cross-contamination?
- What is the rationale for businesses' approach to preventing cross-contamination in instances of non-separation?
- Do businesses have any evidence of effective alternative controls?
- What personal hygiene and handling practices, including effective hand-washing are used?
- What disinfection controls are used (processes)?
- What disinfection products are used?

## 1.3 Methods

Three core phases of research were undertaken:

- Phase 1: telephone interviews with 30 interested parties (trade bodies and industry member that had expressed an interested in this work area) and 10 EHOs to identify 'alternative' control measures and gather evidence as to their effectiveness in preventing cross-contamination risks.
- Phase 2: quantitative telephone survey with small and micro food businesses to identify current practices in relation to the use of complex equipment and alternative practices to non-dual use.
- Phase 3: case studies of 'alternative' controls in practice.

**Phase 1: Telephone survey of interested parties and EHOs**

The purpose of the in-depth telephone interviews with interested parties and EHOs was to elicit detailed proposals for alternative controls to the separate use of complex equipment in effectively controlling the risk from *E. coli* O157.

A series of in-depth interviews were conducted with these stakeholders identified by the FSA as interested parties who were sent the original consultation on the principles of the guidance. The stakeholders included: larger businesses, trade associations, consumer groups and large catering businesses.

These interviews were supplemented by discussions with EHOs who had participated in previous research conducted in 2012 which evaluated the new guidance produced by the Food Hygiene Delivery Programme (FHDP) on controlling *E. coli* O157 cross-contamination. During this survey, a number of EHOs indicated that non-dual use was going to be a challenge for small businesses. These in-depth interviews were an opportunity to gain a more detailed account of their reasons for this view and suggested practical alternative controls to provide an instructive additional perspective for the study.

Emergent findings from this stage shaped the design of the food business survey questionnaire, ensuring that the survey questionnaire was relevant and comprehensive in terms of the range and detail of equipment used and the types of alternative controls that businesses might already be using. It also provided an early opportunity for the FSA to gather evidence of alternative controls that could be tested under laboratory conditions.

A total of 40 semi-structured telephone interviews (30 with stakeholders and 10 with EHOs) were conducted between 5th and 24th July 2013.

## Phase 2: Telephone survey of food businesses

The telephone survey of food businesses was designed to follow up anecdotal evidence of alternative controls provided by stakeholders by speaking directly to businesses about the cleaning and disinfecting procedures followed for complex equipment, used for both raw and RTE foods.

Between 8th and 21st August 2013, a total of 401 telephone interviews were conducted with small and micro food businesses (employing fewer than 50 staff at that site) across the UK. To qualify for the survey, businesses were required to handle both raw and ready-to-eat foods and use complex equipment. It was agreed with the FSA that a sample of this size would constitute a sufficient number of interviews to be able to identify a range of alternative practices used by food businesses to control the risk of *E. coli* O157cross-contamination.

The respondent was the most senior person within the business responsible for food safety at the site, which in the case of smaller businesses tended to be the owner or manager. Their suitability was verified at the outset of the interview using a screening question agreed in conjunction with the FSA.

Relevant business sectors for the research were selected using the UK Standard Industrial Classification (SIC) 2007 and included hospitality businesses, specialist food retailers, general retailers and businesses operating within the food manufacturing sector. To ensure relevant businesses in the manufacturing sector were targeted, only those operating under the description “Production of meat and poultry meat products” were sampled as they were more likely to handle both food types (e.g. boiled ham and raw sausages). The specific SIC codes identified for the research are listed out in Table 1.1.

**Table 1.1: Sectors covered by the telephone survey**

| **UK SIC 2007 Sub-class** | | **Survey grouping** |
|---|---|---|
| Code | SIC description | |
| 47.24 | Retail sale of bread, cakes, flour confectionery and sugar confectionery in specialised stores | Bakers |
| 47.22 | Retail sale of meat and meat products in specialised stores | Butchers |
| 47.29 | Other retail sale of food in specialised stores | Delicatessens |
| 56.21 | Event catering activities | Caterers |
| 56.29 | Other food service activities | |
| 47.11 | Retail sale in non-specialised stores with food, beverages or tobacco predominating | General retail |
| 47.19 | Other retail sale in non-specialised stores | |
| 47.30 | Retail sale of automotive fuel in specialised stores | |
| 55.10 | Hotels and similar accommodation | Hotels |
| 56.30/2 | Public houses and bars | Pubs and bars |
| 56.10/1 | Licensed restaurants | Restaurants and cafes |
| 56.10/2 | Unlicensed restaurants and cafes | |
| 56.10/3 | Take away food shops and mobile food stands | |
| 10.13 | Production of meat and poultry meat products | Food manufacturing |

The sample was sourced in two ways. Half of the interviews were achieved with businesses who had participated in the research conducted in 2012 which evaluated the new guidance produced by the FHDP on controlling *E. coli* O157 cross-contamination. The advantage of sampling businesses that had already participated in this previous research was that a pool of pre-screened sample, known to already handle both raw and ready-to-eat foods was readily available. By the end of this previous survey a total of 824 businesses had agreed to be re-contacted to take part in further research.

One specific feature of this sample source precluded it from being the exclusive source of sample for this piece of research. Over half (56%) of the food businesses surveyed in 2012 were aware of the FSA guidance on cross-contamination and there were concerns around how this might impact on the likelihood of businesses to use alternative methods to the dual use of complex equipment to safeguard against cross-contamination. It was agreed with the FSA that the remaining interviews would be achieved using a fresh sample.

Contact details and basic profile information (size, sector etc.) for the fresh sample of businesses were purchased from Experian. Experian is one of the UK's most comprehensive business databases which combines data from various sources including Yell (the Yellow Pages) and the Thomson business database. Critical for this survey was the fact that their coverage of small establishments is very good.

The main survey adopted a stratified random sampling approach whereby the business population was divided into sector subgroups (or strata) and within each stratum a subset of food businesses were selected for survey entirely at random. Quotas were set to reflect the relative risk of cross-contamination within each sector and these were agreed with the FSA. A minimum of 20 interviews were achieved with each sector.

A total of 28 pilot interviews were conducted towards the end of July 2013 to test the flow and wording of the questionnaire as well as the qualification rates of food manufacturing businesses. This exercise also provided an indication of the proportion of businesses that dual-used complex equipment and early evidence of alternative controls used by food businesses to protect against cross-contamination.

The final profile of the interviews achieved by sector, size and country is detailed in Table 1.2.

The telephone interview comprised four main sections and opened with a firmographics section. The survey also collected information on: the types of complex equipment used; whether complex equipment was used for both raw and ready-to-eats foods and if so, methods used to clean and disinfect; and other controls in place to prevent cross-contamination. On average, the telephone interview lasted 7 minutes.

At the end of the interview, respondents that dual-used complex equipment were asked if they would be willing to be contacted again to take part in further research about the alternative controls used to prevent against cross-contamination. Those respondents who agreed formed the sampling frame for the final stage of the research - case studies of 'alternative' controls in practice.

**Table 1.2: Final Survey Sample Characteristics**

| | | | Column % | N |
|---|---|---|---|---|
| **Sector** | Retail | | | |
| | | Butcher | 22 | 90 |
| | | Baker | 5 | 20 |
| | | Delicatessen | 10 | 40 |
| | | General retail | 5 | 20 |
| | Caterer | | | |
| | | Restaurant | 17 | 70 |
| | | Hotel | 6 | 25 |
| | | Pub/bar | 17 | 70 |
| | | Catering | 10 | 40 |
| | | Manufacture of meat and poultry products | 6 | 26 |
| **Size of business** | 1-4 | | 35 | 140 |
| | 5-10 | | 26 | 105 |
| | 11+ | | 39 | 156 |
| **Country** | England | | 63 | 251 |
| | Scotland | | 25 | 99 |
| | Northern Ireland | | 5 | 19 |
| | Wales | | 8 | 32 |
| **Total** | | | **100%** | **401** |

**Phase 3: Case studies**

In order to follow up issues and questions emergent from the survey and stakeholder interview findings, 4 case studies were conducted. These permitted observation of practices on the ground as businesses conducted their normal activities. These observations provided an important supplement to telephone descriptions of practices and highlighted how the alternative controls operated in practice.

The case studies explored reasons for particular practices and contextualised findings in terms of business size and sector. The purpose of the visits was to:

- View premises – to gain an understanding of whether and how physical space can impact upon implementation approaches
- Talk to managers – to discuss their rationale for particular approaches in operation, and
- Observe cleaning practices

The sampling frame for the case studies was the small business survey conducted at phase 2. Case studies were selected from among those businesses which had agreed to be re-contacted and which were practicing potentially viable 'alternative controls'. Criteria used to identify suitable case studies included**:** having the potential to reduce the level of *E. coli* O157 to an acceptable level; being practical in terms of implementation (with reference, for example, to space requirements, cost, necessary expertise, staffing requirements); and being able to generate consistent and effective outcomes.

Topic guides used for the interviews and observation checklists are provided as Appendix 2.

## 1.4 Report structure

The report collates findings from all three phases of the study, organised into three chapters:

Chapter 2: Presents the views of stakeholders, including 30 trade representatives, and 10 Environmental Health Officers

Chapter 3: Presents findings from the 401 small and micro food business survey

Chapter 4: Presents findings from the four case studies.

# 2 Stakeholder and Environmental Health Officer Views

This chapter examines stakeholder and EHO views on the *E. coli* O157 guidance. It describes 'alternative' controls proposed; sets out the degree of faith stakeholders have in chemical disinfection; and highlights reservations about the guidance and the range of equipment described as complex. The chapter also indicates stakeholder perceptions of the challenges faced by small businesses in adhering to recommended practice to avoid cross-contamination, including cost and space. Issues relating to consistency in interpretation among EHOs are also explored. Finally, stakeholder views on the importance of training, support and communication are set out.

## 2.1 Wide range of views on the advice

Stakeholders expressed a variety of views in relation to FSA advice on *E. coli* O157 cross-contamination and on the recommendation for the complete separation / separate use of complex equipment used for preparing raw and ready-to-eat foods. Some respondents were supportive of the advice, believing it to be the only safe approach and offering few, if any alternatives:

> *We believe it is the only way people should operate to be safe. The priority you always have is you don't mix and match. You start mixing and matching you'll fall down somewhere along the line.*
>
> **Trade Association**

Other respondents (and their members) thought the advice was '*confusing*' or '*impractical*', '. They had concerns with which pieces of equipment were categorised as 'complex' in the guidance (detailed below). They also stressed that even with separation of complex equipment you still cannot guarantee against human error. These concerns are discussed in more detail below.

A small number of stakeholders were strongly opposed to the guidance and the principle of complete separation for complex equipment. They considered the guidance to be without scientific justification and to be instrumental in some businesses having to close.

The views of other stakeholders were much more mixed. While they agreed with the sentiment of the advice and understood the reasons for implementing it, they believed it to be burdensome for businesses and took particular issue with the FSA's insistence that chemical disinfection cannot ever be deemed safe and appropriate. Some also understood the rationale for the advice but believed there to be insufficient scientific evidence to support the FSA's advice, while others disagreed

about specific complex equipment that should be included within the guidance (discussed further below).

Although a number of EHOs had specific issues with the advice that mirrored stakeholder concerns (complex equipment definitions, impact on business, chemical cleaning as an alternative, perceived lack of scientific evidence etc.), most did say that businesses were broadly receptive to the guidance and that most were fairly willing to comply.

## 2.2 Relatively few instances of genuinely 'alternative' controls

Respondents were aware of a few alternative controls being used by member organisations. Perceived 'alternative' controls that were cited included:

- Stripping machines down and using either steam or boiling water to clean;
- Timed separation – using equipment at different times separated by strict steam or very hot water clean;
- 'Safe barriers' on weighing scales;
- Sanitised wipes for temperature probes;
- Doing more 'at the source' - eradicating from animals themselves / screening before slaughter.

When asked for other evidence or research in relation to alternative controls and whether they are effective most stakeholders struggled to suggest anything. However, a few did and the following were cited:

- Dinsdale report (Dinsdale, 2011) – which argues that there has not been a proper assessment of the potential for cross-contamination from dual-use of vacuum pack machines.
- Commissioned research on temperature probes from Campden BRI laboratory (http://www.campdenbri.co.uk/) – which it was claimed provided evidence that sanitised wipes are as effective as thermal disinfection[3].

[3] This lead was followed up and we received the following response from Campden BRI: "*to the best of my knowledge Campden BRI have never compared disinfectant wipes to thermal disinfection for temperature probes. There would be a number of issues prior to designing such a test, especially fixation of proteins etc to the surface if the probe was not effectively cleaned prior to thermal disinfection*".

## 2.3 Chemical disinfection widely perceived to be a safe and viable alternative

Although the FSA do not perceive that chemical cleaning is as effective as full separation there was a clear strength of feeling among stakeholders with regards to the legitimacy of such an approach. For some there was a belief that chemical disinfection can be as effective as separation so long as the right processes are followed. One stakeholder noted:

> *One possible solution is to say you can use complicated equipment for both raw and cooked meats if they really are cleaned and disinfected thoroughly in-between. If you apply the principles of HACCP then it must be acceptable. To dismantle, clean and disinfect thoroughly that would be difficult for complicated machinery but can be done, I am sure.*
>
> **Large Employer**

For some, the legitimacy of chemical cleaning was based around a belief that it is an entirely appropriate method for certain pieces of equipment. While stakeholders generally accept that for complex slicers and mixers there are unlikely to be a reliable alternative, the situation is, they said, very different for other items such as scales. This point is discussed in section 2.4 below.

For some stakeholders, it was suggested that separation represents the '*Gold Standard*' but that the FSA need to recognise the practical challenges faced by small businesses. . Essentially these stakeholders are implicitly recognising the greater risk associated with chemical cleaning but believe that more practical advice is required, as highlighted by the following quote:

> *That would have commercial problems because of the cost in terms of additional space for segregation. That would not be commensurate with the risk – it would be disproportionate. It's not the only safe approach. There is no reason why you can't just carry out hygienic cleaning of the machinery.*
>
> **Large employer**

One stakeholder (a large employer) spoke of specific detergents and disinfectants that they used (Assert Lemon detergent[4] and Sirafan Speed disinfectant spray) on some complex equipment. The fact that these were approved by the British Standard and purchased from a company that has carried out testing legitimised their use according to stakeholders.

[4] It should be noted, however, that detergent on its own does not provide disinfection.

EHO views on the subject generally echoed those of the stakeholders with a number saying that chemical cleaning can offer an alternative.

## 2.4. Not all complex equipment felt to be 'complex'

Many stakeholders said that some pieces of equipment should not be considered 'complex' and could therefore be effectively cleaned through regular cleaning and sterilisation between uses. While stakeholders generally agree that for complex slicers and mincers there are unlikely to be reliable alternatives, the situation was considered to be different for other items. Several stakeholders wanted more scientific testing to be done in this area. Examples of less complex equipment cited by respondents were probe thermometers and some scales. The complex nature of Vacuum packing machines and mixers was also queried by some stakeholders.

***Vacuum Packers***

In the case of the vacuum packing machines a number of stakeholders argued that not all types pose risks.

> *If you are talking about a gas flush machine there could be a risk of contamination, but if you are talking about a pure vac pack machine without gas flush then the risks are minimal*
>
> **Consultancy / Food Safety Organisation**

Respondents argued that the food doesn't come into contact with the inside or outside of the machine if the operation is carried out correctly. It was recognised that the outside of the machine might be handled by somebody who had been handling raw meat before they packaged their ready-to-eat product, but on that basis it would be important to keep the outside of the machine properly cleaned and disinfected.

Vacuum packers were also the main piece of equipment that EHOs discussed. Some reported that, as a result of the guidance, businesses have simply stopped using vacuum packers for ready-to-eat foods. Other EHOs, however, also questioned their inclusion in the guidance:

> *I can logically understand certain pieces of equipment like a mincer… Things like vacuum packers where you've got something coming down and just cutting the packaging I can't get my head around. That's quite difficult then to get the business to comply. We do, but you can see how a vacuum packer could effectively be cleaned.*
>
> **EHO**

***Temperature Probes***

Temperature probes were the other main source of confusion. Most modern food probe thermometers are designed to be submerged in water so they are completely impermeable to moisture (and therefore suitable for hot water disinfection). A couple of stakeholders stated that their members / employees used sanitised wipes for dual use temperature probes. This was because thermal disinfection wasn't always considered possible (either because commercial dishwashers may damage probes or because it was felt to be too dangerous for individuals to put temperature probes into boiling water). One large employer reported that they had commissioned research which they said proved sanitised wipes were as effective as thermal disinfection[5].

***Weighing Scales***

The other piece of equipment that was queried by some stakeholders and EHOs was weighing scales. It was felt that scales can readily be cleaned, disinfected and sanitised. Furthermore some respondents said that safety barriers such as a piece of film are effective in preventing cross-contamination.

***Mixers***

One EHO said that some mixers and robochefs can go through the dishwasher on a hot cycle and that this is adequate disinfection.

## 2.5 Space and finance key problems food businesses face in complying

The biggest problems that businesses have faced in complying with FSA advice on cross-contamination are centred on finance and space[6]. Many stakeholders and EHOs talked about the financial burden on businesses, usually in terms of them needing to purchase additional equipment or occasionally in terms of having to cut back on the range of products sold (e.g. rather than purchasing a 2nd vacuum packer, businesses would stop selling certain RTE products).

The additional space required for separation was cited as a major challenge to businesses by many stakeholders. Their members are typically very small businesses with limited space.

[5] This research was not provided by the employer.

[6] Smeaton et al (2012) *Evaluating FSA Guidance on Cross-contamination of E. coli O157*. Food Standards Agency, London.

A few respondents highlighted the fact that you can have separate equipment but with no room to physically separate the items, it isn't necessarily effective separation

> *Many times we see a vacuum packer dedicated to raw products and one for cooked and they are side by side; it is separate equipment but not separation. Very often the layout of the building precludes them from being able to separate equipment effectively.*
>
> **Consultancy / Food Safety Organisation**

## 2.6 A lack of consistency in interpretation of the guidance by EHOs

A number of stakeholders expressed their concern about the inconsistent interpretation and implementation of the guidance by EHOs:

> *They've (businesses) found huge inconsistencies with the way EHO's interpret the guidance. Because of that, it creates mayhem. Particularly if you're a multi-site business. Mind if you're a small business you haven't got a clue and most of them are frightened of the EHO anyway...I've fed back that some of the EHOs take it letter by letter, word by word and others don't.*
>
> **Trade Association**

Stakeholder concern over consistency was echoed by some EHOs, who reported different interpretations of the aspects of guidance:

> *There is a consistency issue. Some of the authorities have insisted that because of the FSA guidance that weighing scales were considered to be complex equipment, so in one city they've said "You must provide separate weighing scales . However, that's not happening in every single one of their premises and they're not doing it unless they're being forced to comply with it by the Local Authority.*
>
> **EHO**

## 2.7 The importance of training, support and communication

A few stakeholders made the point that focusing almost exclusively on separation and trying to remove human risk has the potential to backfire as there may subsequently be less focus among employers on training, support and communication which was said to be as, or more, important than separation itself. Tied to this view was the belief that as there is no perfect solution, the main focus

needs to be on education, training and support to ensure that risks are minimised. Separation was regarded as key, but it needs to be viewed as one measure alongside a suite of others and, most critically, alongside training to prevent human error, as highlighted in the following quotes:

> *It is not the only safe approach. . Even if you have separate machinery for raw and cooked and it's not cleaned properly, you will still get a potential contamination. There is not a perfect solution. It has got to be down to education always. Separate use is part of the answer but not the total answer. It's all down to training*
>
> **Trade Association**

> *If you fail to attempt to instil a good food safety culture, whether you have the separation of complex equipment or not you still have a high risk because of the attitude of the food handlers... You can certainly have 2 different pieces of equipment, such as 2 different probes – 1 for raw and 1 for RTE – but whether that food handler is going to use the right one is another question.*
>
> **Large Employer**

# 3. Food business survey findings

This chapter examines: food businesses' use of complex equipment and whether it is used for both raw and RTE food; reasons for dual use; and the methods and products used to clean complex equipment. The chapter also investigates how businesses ensure their cleaning methods can reliably protect against the risks of cross-contamination, how they prevent human error and what evidence they draw upon to be confident that their cleaning approaches are effective.

## 3.1 Use of complex equipment

All 401 surveyed food businesses used complex equipment at their site, ranging from 1 to 9 pieces of equipment. 77 of the 401 food businesses (i.e. 19%) used at least one piece of equipment for both raw and RTE food. Table 3.1 indicates how many businesses used each piece of equipment. The incidence ranged from:

- a high of 99% of businesses using temperature probes and 85% using weighing scales;
- to a low of 4% using sausage machines;
- surveyed businesses also used vacuum packers, slicers, mincers, food processors and overwrapping machines.

Table 3.2 indicates, for each item of equipment, whether it was used for both raw and RTE food. No food business used their sausage machines or mincers for raw and RTE foods. Just 2% of food businesses used their vacuum packers or slicers for both raw and RTE food, whilst 8% of businesses permitted dual use of their food mixers or scales. Dual use was most common in relation to temperature probes and overwrapping machines, at 9% and 11% respectively.

**Table 3.1: Whether food businesses used complex equipment**

| | Have item of equipment | |
|---|---|---|
| | % | N |
| Vacuum packer | 32 | 130 |
| Slicer | 52 | 207 |
| Mincer | 33 | 133 |
| Mixer or food processor | 49 | 197 |
| Weighing Scales | 85 | 342 |
| Overwrapping machine | 29 | 116 |
| Temperature probe | 99 | 397 |
| Sausage machine | 4 | 15 |
| Other complex equipment | 10 | 41 |
| Base | | 401 |

Q:B1 *Do you use any of the following...? Multiple response option*

**Table 3.2: Equipment used for both raw and ready-to-eat foods**

| | N | % | Base |
|---|---|---|---|
| Vacuum packer | 2 | 2 | 130 |
| Slicer | 3 | 2 | 207 |
| Mincer | 0 | 0 | 133 |
| Mixer or food processor | 16 | 8 | 197 |
| Weighing Scales | 27 | 8 | 342 |
| Overwrapping machine | 13 | 11 | 116 |
| Temperature probe | 36 | 9 | 397 |
| Sausage machine | 0 | 0 | 15 |
| Other complex equipment | 2 | 5 | 41 |

Q:C2 *Do you ever use the same single [piece of equipment] for both raw and ready-to-eat foods? Multiple response option*

**Why businesses dual use equipment**

Businesses which had more than one of each piece of equipment were asked why they did not separate their equipment for raw and RTE food;responses are presented in Table 3.3. Sample sizes are too low to provide percentages, raw numbers are therefore given. Businesses said that dual use of equipment is more efficient or that it is too difficult to separate.
Businesses also justified dual use on the grounds that they clean their equipment between uses.

**Table 3.3: Reasons for not separating complex equipment for raw and RTE food**

| | Mixer or food processor | Weighing scales | Overwrapping machine | Temperature probe |
|---|---|---|---|---|
| | N | N | N | N |
| Haven't ever thought about separating | 0 | 0 | 1 | 2 |
| More efficient to use for both | 3 | 2 | 0 | 6 |
| It is too difficult to separate | 1 | 2 | 3 | 0 |
| No need, equipment cleaned between uses | 2 | 3 | 1 | 6 |
| Other | 2 | 0 | 0 | 1 |
| Don't know | 0 | 3 | 0 | 0 |
| Base | 8 | 10 | 4 | 13 |

Q:C3. *Why aren't the [piece of equipment] separated out for use only for raw foods or only with ready-to-eat foods at this site?* Multiple response option
Base: Businesses which dual used equipment despite having 2 pieces of the same equipment

## 3.2 Cleaning, disinfection and other approaches used to prevent *E. coli* O157 cross-contamination

### 3.2.1 Methods Used

A variety of methods were used by businesses to clean and disinfect dual use equipment. These are presented in Table 3.4 which provides the raw numbers

(because of the low base sample sizes). For all equipment, the most commonly stated methods and products included: detergents; disinfectants; sanitisers; hot water above 80$^{o}$C; disposable cloths; or dishwasher. Less widely used methods and products included: dishwasher combined with chemical disinfectant; ozone cleaning; steam cleaning; and plasma cleaning[7].

**Table 3.4: Products and materials used to clean and disinfect complex equipment used for both raw and ready-to-eat foods**

| | Vacuum packer | Slicer | Mixer | Scales | Overwrap machine | Temperature probe |
|---|---|---|---|---|---|---|
| | N | N | N | N | N | N |
| Detergents (1) | 2 | 1 | 11 | 23 | 11 | 12 |
| Disinfectants | 1 | 2 | 10 | 16 | 10 | 22 |
| Sanitisers | 1 | 3 | 15 | 26 | 13 | 30 |
| Non-chemical disinfection – hot water > 80°C | 2 | 2 | 9 | 14 | 8 | 22 |
| Non-chemical disinfection – steam cleaning | 0 | 2 | 3 | 3 | 1 | 3 |
| Disposable cloths | 1 | 3 | 14 | 20 | 10 | 31 |
| Dishwasher above 80°C | 1 | 3 | 12 | 15 | 5 | 10 |
| Dishwasher at lower temperature + a chemical disinfectant | 1 | 2 | 3 | 7 | 3 | 6 |
| Ozone cleaning | 0 | 0 | 1 | 1 | 2 | 0 |
| Plasma cleaning | 0 | 0 | 1 | 2 | 1 | 2 |
| Base | 2 | 3 | 16 | 27 | 13 | 36 |

Q: D1 and D2. *What products and materials are used to clean and disinfect the piece of equipment at this site?* Multiple response option. Note (1) It should be noted that use of detergents alone does not constitute disinfection

**Other Controls**

In addition to the cleaning methods and products cited above, food businesses also deployed other controls to prevent *E. coli* O157 cross-contamination. These are set out in Table 3.5. A range of methods to ensure clean hands were cited - single use towels or hand driers; NHS approved hand washing techniques; disposable gloves;

[7] Ozone is an alternative to chemical cleaning. Food businesses did not provide an account of how plasma cleaning was being used.

separate washing basins; and non-hand-operable taps. Apart from hand protection the most commonly used controls included: HACCP plans (95%); clean-as-you-go (96%); tongs and other utensils for handling food (92%); and protective clothing (88%). Time and space separation approaches were also practiced by around three fifths of food businesses - specifically: handling raw and RTE foods at different times of the day (62%) and separation of staff handling raw and RTE foods (61%).

**Table 3.5: Other controls aside from cleaning and disinfecting currently used to guarantee against *E. coli* O157 cross-contamination when using the same piece of complex equipment for raw and ready-to-eats foods**

| | % | N |
|---|---|---|
| Handling of raw and RTE foods at different times of the day | 62 | 48 |
| Separation of staff handling raw and ready-to-eats foods | 61 | 47 |
| Disposable protective clothing e.g. gloves, aprons, hairnets | 88 | 68 |
| Tongs and other utensil for handling food | 92 | 71 |
| Recognised hand washing techniques (such as DoH or NHS) | 90 | 69 |
| Separate washing basins for staff handling raw and RTE foods | 73 | 56 |
| Non-hand-operable taps | 33 | 25 |
| Single use towels or hand driers | 95 | 74 |
| Clean-as-you-go approach in relation to packaging materials | 96 | 74 |
| HACCP plan (including SFBB, Cooksafe and Safe Catering) | 95 | 73 |
| Base | | 77 |

Q: D11. *And do you use any of these following controls...?* Multiple response option

### 3.2.2 Methods used – detailed accounts (verbatim responses)

Table 3.4 above indicates which products and approaches to cleaning were used. Table A1 in the Appendix provides more detail on how these products and methods were applied in order to determine whether they might be considered potentially viable ‘alternative controls’. It lists verbatim the approach food businesses took to cleaning their dual use complex equipment.

Methods deployed which may constitute viable ‘alternative’ controls included the following cleaning approaches cited by several food businesses. In relation to mixers, vacuum packers, over-wrappers, scales and slicers which can be dismantled, potentially safe alternatives used the following stages:

- Hands washed prior to cleaning
- Disassembly of equipment
- Removal of food debris using single use sanitised cloths
- Parts of the equipment which come into direct contact with food submerged into hot water to vigorously rub in order to remove food debris
- Heat disinfection stage – used a dishwasher at a temperature of 60 degrees or higher OR
- Chemical disinfection – either submerged parts in a recommended dilution of liquid disinfection for a recommended period of time or sprayed with a sanitiser/disinfectant (some are designed to be left on, others to be wiped off after a recommended period of time)
- Drying stage – businesses used a variety of approaches including air drying, paper towels, and single use cloths[8]
- The parts which could not be submerged in water for cleaning and which did not come into direct contact with food were wiped or sprayed with sanitisers/disinfectants. Some businesses used a two-stage cleaning process, for example using a sanitiser to clean, followed by a wipe with a single use cloth and then sanitised again to disinfect.

In relation to temperature probes, potentially safe alternatives used a combination of the following stages:

- After use, wiped with sanitiser/antibacterial wipes
- Placed in boiling water and cleaned with detergent
- Wiped again or sprayed with sanitiser or allowed to sit in liquid sanitiser for recommended period of time
- Drying techniques – air dried, used blue paper towel or wiped with single use cloth
- Sanitised again immediately before next use

While some businesses reportedly followed each of these multiple steps, others only followed some steps. It should also be noted that reported and actual practices may diverge, particularly in the context of busy environments.

[8] Air drying is the official recommended method if the equipment is hot (e.g. after hot dishwasher) and the area is clean and free form aerial contamination. There is a risk that wet equipment might be put away if people are in a hurry.

### 3.2.3 Ensuring reliability of practices

Having described their cleaning methods, food businesses were asked how they make sure the cleaning methods they used were equally reliable in protecting against the risks of cross-contamination as using a single piece of complex equipment for use only for raw foods or only with RTE foods[9]. Verbatim responses are presented in Table A2 in Appendix 1. Systems and practices deployed can be summarised into the following 12 categories – presented in order of frequency of response:

- Careful training of staff
- Clean-as-you-go / constant cleaning after each use
- Constantly checking for hygiene / cleanliness (including swabbing)
- Systematically following guidelines / procedures
- 'Trusting' own cleaning on basis of experience / training / being thorough
- Regular updating of paperwork / forms / charts
- Time separation when preparing food
- Used safety barriers
- EHOs have checked / sanctioned processes
- Use of chemicals / correct cleaning products
- Dishwasher regularly checked for temperature
- Single use of cloths

### 3.2.4 Ensuring against human error

While businesses may understand and apply optimal cleaning practices and correctly use their complex equipment, human error remains a potential source of risk. Surveyed food businesses were therefore asked how they ensure against human error during busy periods[10]. Verbatim responses are provided in Table A3 in Appendix 1. The three most common responses referred to:

- Rigorous training of all staff (including team meetings)
- Adherence to systematic and regular schedules / checklists / rules / procedures
- Checking each other and / or close supervision of staff

[9] Q:D5 *How do you make sure that these methods are equally reliable in protecting against the risks of cross-contamination as using a single piece of complex equipment for use only for raw foods or only with ready-to-eat foods*?

[10] Q:D6 *In terms of the alternative methods you've described, how do you ensure against human error during busy times?*

Other responses included:

- Being vigilant / careful
- Preparing before busy periods / planning ahead
- Use of protective clothing
- Recording of cleaning processes and practices
- Years of experience of staff
- Separation of preparation or equipment
- Regular auditing / checks

### 3.2.5 Methods aware of but not used

Food businesses were asked whether there were any other methods for protecting against cross-contamination of dual use equipment, which they were aware of but not currently using. Twenty-three businesses suggested other methods which fell into one of the following 4 categories:

- Heat steam cleaning
- Laser scanner to see whether there is any contamination
- Ozone cleaning
- Plasma cleaning

Food businesses were not able, however, to cite any evidence as to the effectiveness of the alternatives they had offered.

## 3.3 Evidence on reliability of cleaning methods

Food businesses were also asked to provide evidence on how reliable the methods they used were in protecting against cross-contamination when using complex equipment for both raw and RTE foods[11]. The range of responses given is listed verbatim below – they provide an indication of how food businesses think about hygiene and the safety of their practices:

- It's company policy to have the checks annually
- Send swabs away every month to a lab
- Head Office safe food manual

[11] Q.7: *Do you have any evidence as to how reliable these methods are in protecting against cross-contamination when using complex equipment for both raw and ready-to-eat foods at this site?*

- I have all the test sheets etc.
- Reports that come out- my own knowledge we've never had a problem, if you follow procedures there should be no problem
- I've a folder full of instructions on cleaning
- Environmental health officer checks
- It's tested by our external providers
- We do random sampling to check
- Sign off sheets
- Hygiene certificated and training
- We had CMI audit with swab machine which took a reading and all was fine
- Cleaning chemical supplier and COSHH brochure
- Outside auditor
- We've been given 5 stars from food hygiene inspectors
- Eco-lab test everything we do and teach us how to use their products e.g. dilution levels and training manual provided.

# 4. Case studies

Four food businesses were selected as case studies in order to observe cleaning practices. Each business agreed to demonstrate their cleaning methods. Businesses were selected on the basis of their practices as described during the telephone survey. Businesses were selected if their reported practices included the following methods, on the grounds that the combined use of these practices are likely to be most effective in reducing cross-contamination:

- Disassembly of equipment
- Cleaning for removal of food debris
- Using either steam or boiling water to clean (including dishwashing machines) OR use of disinfectant products for chemical cleaning
- Drying by air or with single use cloths

The 4 case studies are presented below. In each instance a brief description of the business is provided, followed by a description of their approach to cleaning specific items of equipment. At the end of each case study we indicate whether the approach is recommended to be taken to stage 2 – testing in the laboratory. Evaluation criteria against which to assess alternative control proposals, included:

- having the potential to reduce the level of *E. coli* O157 to an acceptable level
- being practical in terms of implementation (with reference, for example, to space requirements, cost, necessary expertise, staffing requirements etc)
- able to generate consistent and effective outcomes
- whether equipment can be placed in dishwashers with high cleaning temperatures OR
- whether all parts of any equipment used are accessible (i.e. can be reached to permit two stage cleaning requirements of removing particles and debris prior to use of disinfectants)

## Case Study 1

### Business type and equipment used

Case study 1 is an event caterer based in a small industrial unit, employing 5 full-time staff (including chef) and 2-3 part timers when required (mainly for serving food at functions). Equipment used for raw and RTE food includes: a mixer, scales, temperature probe and over-wrapper. Dual use is practiced on the grounds that there is no perceived need to duplicate equipment with the associated '*unnecessary expense'*. The business owner is confident they can eliminate risks by their cleaning processes. Cleaning is carried out by the chef or kitchen manager. Cleaning techniques have been advised by a chemical supplier and an EHO has observed their practices and is content. The equipment was described as '*very easy to clean and very easy to see if there is any residue*.'

### 1. Cleaning practices (mixer and scales) – observed

*Preparation stage*

- Operator washed hands
- Moved all dirty equipment to area adjacent to sink
- Equipment broken down into parts, took 2-3 minutes at most

*Washing stage*

- Washed off visual dirt prior to full clean in running water
- Then sink filled with hot water, adding liquid detergent using pump on 5 L container
- Also ran hot water into adjacent rinsing sink
- Parts all immersed and scrubbed (different size brushes available for cleaning) for about 5 minutes

*Rinse and drying stage*

- Equipment then rinsed in adjacent sink containing hot water
- Then placed to drain on drainer
- If required immediately then dried using clean laundered tea towel. Otherwise allowed to air dry.

*Chemical and heat disinfection stage*

- Main body of mixer (electrical) is surface wiped with detergent solution. Some equipment with exposed surfaces is sprayed with made-up domestic sanitiser (Dettox) before re-use. Generally would be left in contact for at least 30 minutes.
- Washed parts are tea towel dried then wiped with non-rinse spray sanitiser
- Used hot cycle (60ºC) of dishwasher for some items.
- Also launder tea towels and coats in washing machine at 60ºC

**Case study 1 continued**

*Handwashing*

- Used a sink with remote operated taps
- Used anti-bacterial liquid soap
- Hand-washing observed was thorough and included wrists- took about 1 ½ minutes
- Kitchen manager washed hands frequently and without prompting e.g. after handling probe used to check meat temperatures and again before handling food.

**The observed cleaning practices mirrored the verbal description from the business owner and were judged to be satisfactory. The approach is recommended for stage 2 testing**

**2. Cleaning practices (temperature probe) – observed**

*Preparation stage*

- Operator washed hands

*Washing stage*

- Immersed the probe in hot water and detergent
- Scrubbed it
- Rinsed it

*Rinse and drying stage*

- Wiped with a paper towel

*Chemical and heat disinfection stage*

- Wiped with a sanitized wipe
- Repeated sanitized wipe again before next use

**The approach used is recommended for Stage 2**

**3. Cleaning practices (over-wrapper) – observed**

The over-wrapper was wiped over with a sanitised wipe. The interviewer/observer felt that it wasn't very clean and suggested that they should re-consider how they cleaned it, especially when they admitted it was occasionally used to cover raw meat. They said that in future they will take it apart and wash by same method as described above for mixer and scales.

**The approach used is not recommended for Stage 2; simply wiping exposed surfaces with a sanitized wipe was insufficient to either clean or disinfect the equipment**

## Case Study 2

**Business type and equipment used**

Case study 2 is a catering butcher with 2 full time members of staff which ssupplies schools, nursing homes, football clubs, pubs, and restaurants. It also supplies retail customers on a smaller scale. The business mainly trades raw meats but also buys in hams for slicing and then hams are re-packed under vacuum. A Henkleman 300 Vacuum packer (not gas flushing) is used. Dual use practiced due to the cost of equipment – especially given that it is used so infrequently for ham. Space is not an issue and they do have a separate slicer used for ham only. The need for two vacuum packers is also considered unnecessary as they are confident their cleaning regime is satisfactory. Cleaning is usually carried out by the proprietor

**Cleaning practices – observed**

*Preparation stage*

- Operator washed hands – then took phone call but did not wash hands again
- Vacuum packer fully disassembled for thorough clean – took about 4 minutes
- Only food contact surface was a  bag in which food is packed but leakage can occur

*Washing stage*

- Boards appeared visually clean so no removal of 'soil'
- Boards and other removal items submerged – boards too big to be fully immersed so rotated during cleaning
- Hot water run into sink – [note temperature of water on boiler was only 43ºC] comment was made that sometimes short of hot water
- Equipment scrubbed and also wiped over with cloth
- Cloths soaked overnight in unmeasured bleach solution - smelled strongly of chlorine
- Cloth used to wipe over handle, cover and inside of vacuum packer including around vacuum nozzles

*Rinse and drying stage*

- Boards rinsed off in running warm water
- Wiped over with squeezed cloth and allowed to air dry

*Chemical or heat disinfection stage*

- Equipment re-assembled and top surfaces sprayed with Dettox sanitiser (left overnight)
- Cleaning method should include heat but water temperature observed was inadequate
- Undiluted liquid sanitizer used
- Contact time is not stated on the product – but it is a non-rinse formulation
- Equipment unlikely to be used immediately after re-assembly but could happen

*Handwashing*

- One separate hand wash sink at entrance to room – separate hand operated taps
- Solid bar of anti-bacterial soap is used (stated EHO aware)
- Hand washing only observed once during visit – not very thorough clean but then hands immersed fully in washing up sink

**The observed practice was consistent with the owner's verbal description.  However the use of an unorthodox chemical mixture did cause concern about his understanding of chemicals. Overall, the cleaning technique is recommended for Stage 2 testing.**

## Case Study 3

**Business type and equipment used**

The business has been in operation for 11 years and undertakes catering for all occasions. Their main business is weddings. There are 2 full time staff and up to 27 part-time staff during busy periods. The site visited was the central kitchen where food preparation is carried out. If catering off site, the business uses a travelling kitchen with ovens, handwash facilities and hot plates. Disposable foil dishes are used to cook raw food (e.g. meat) on site. Saucepans are brought back to base for washing up. Crockery is hired for dirty return to hire company.

Equipment observed: Vacuum packer (Tepro, 11 years old) and 2 mixers. Reasons given for dual use were mainly financial - it would cost over £2,000 to buy a new mixer or vacuum packer. In addition, they do not have the space to double up as all their space is used. Furthermore, the owner does not perceive non-dual use as necessary as he considers their cleaning practices to be safe. The business did receive a letter from an EHO some months ago about the use of one of their Robochefs, warning of risks of *E. coli* cross-contamination, but the EHO was satisfied during a visit that their practices were acceptable so the matter was not pursued further.

The equipment was cleaned immediately after use as usually required for other purposes – typically 5/6 times a day.

**Cleaning practices – observed**

*Preparation stage*

- Equipment fully disassembled for thorough clean – took less than 1 minute
- Food removed so would not come into touch with non-cleaned parts of equipment

*Washing stage*

- 2 Wash up sinks were located away from main food preparation area with adjacent dishwasher
- Heavily soiled equipment was washed up in large SS sink to remove heavy soil before items placed in dishwasher or sanitised – this included boards from vacuum packer, and bowl and tools from mixers
- These items were submerged in hot (>55°C) soapy water (Fairy Liquid – 2 squirts of dispenser which produced large quantity of bubbles), then wiped with disposable J cloth
- Fixed items such as the vacuum packer frame and lid and mixer stand were wiped over with J cloth soaked in sanitiser, left for 5 minutes and then rinsed off (chemical states minimum 1 minute contact time).

**Case study 3 continued**

*Rinse and drying stage*

- The second sink was used for very hot rinse water
- Items then drained

*Chemical or heat disinfection stage*

- Plastic spacers from the vacuum packer were cleaned in a dishwasher (temperature dial indicated 62°C at bottom and 83°C at top). The dishwasher cycle was very quick so had a fast turnaround although usually had to wait for equipment to cool before could use again.
- A very hot drying cycle was used – too hot to handle
- Re-assembled when next required
- Fixed items were wiped using Jangro liquid kitchen sanitiser in addition to a dilutable version of sanitiser for use in spray bottle. One checklist duty performed each day on opening was to check sanitiser spray bottles and make them up. Dilution stated by operator to be 1:4 parts of water (*recommended dilution by chemical company is 30ml of chemical to 500ml of water in a 750ml spray bottle – equivalent of 1:16 – this was pointed out but owner stated he was happy to be on safe side of chemical strength*). Dilution was measured out by experienced operator
- Equipment was re-assembled and then re-sprayed with sanitiser, but not wiped

*Handwashing*

- Bactericidal hand wash used
- Operators were observed to wash hands frequently
- Hands washed thoroughly, including wrists
- Paper towel roll for drying hands
- *Only concern was location of handwash basin which was slightly out of the way and not at entrance to room – however staff were observed to use it during the visit.*

**Overall, the cleaning techniques used were as described by the owner and are recommended for Stage 2 testing.**

## Case Study 4

**Business type and equipment used**

The business is a bakery which has been in existence for 20 years in a high street. The baker also provides some catering to small local businesses, including for staff of a local care home. Most meat pies are bought in prepared, frozen for oven baking but the baker does prepare some dishes such as chilli con carne using raw meat. They also make their own pastry for fruit pies. Only the baker does baking, although other staff will assist with washing up under supervision. 2-3 staff usually on duty, the shop may contain 10-15 people at busiest times, but serving staff normally cope.

Dual use equipment includes scales and temperature probe. The business owner did not see need for separate equipment as it is only rarely used for raw food and believed their cleaning regime is satisfactory to deal with any potential cross-contamination. No EHO had informed him of the necessity of purchasing additional pieces of equipment.

Equipment was cleaned immediately after use if changing type of food ingredient. Frequency of cleaning depended on usage. Scales mostly used for dry ingredients but washed immediately after use for raw foods.

**Cleaning practices – observed**

*Preparation stage*

- Scales did not require disassembly – just a pan and cover was removed

*Washing stage*

- The pan and scale cover were submerged in hot soapy fairy liquid and washed with cloth for about 30 seconds.
- Then rinsed in cleaning running hot water
- Remainder of scales wiped over using single use cloth soaked in hot soapy water. However due to use of flour the scales were slightly caked in flour deposits which were difficult to completely remove
- The temperature probe was wiped after use with cloth soaked in hot soapy detergent and then dipped into neat sanitiser container

**Case Study 4 continued**

*Rinse and drying stage*

- The scale pan and cover were dried with a clean dry tea towel and placed back on scales frame
- The temperature probe was left to air dry.

*Chemical or heat disinfection stage*

- Disinfection of scales was achieved by use of hot water for washing up (temperature of water unknown and duration of cleaning was short – 30 seconds)
- Disinfection of temperature probe was achieved by immersion in neat sanitiser
- Liquid detergents used: Fairy liquid for initial washing up
- Sanitisers used: Killex (CSL Chemicals, Carlisle). Required dilution for use but was not measured, instead diluted by eye. Used at far higher concentrations than recommended. The Killex recommended dilution rate is 1:300 whereas in practice it was used at 1:10 in spray bottle as final sanitiser.

*Handwashing*

- Used CSL bactericidal handwash
- Handwashing was observed to be frequent and included wrists, taking about 40 seconds
- One handwash sink located next to washing up sink and a second sink at entrance to food preparation area and baker was observed to wash hands when going in and out of food preparation room

**Overall, the cleaning techniques used were as described by the owner but are not recommended for Stage 2 testing. Disinfection of scales was not achieved and the temperature probe was merely dipped in disinfectant without wiping.**

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# Appendix 1: Verbatim Responses

**Table A1: Detailed descriptions of the processes food businesses go through in cleaning and disinfecting the complex equipment used for both raw and ready-to-eat foods[12]**

| | Vacuum Packer | Slicer | Mixer / Food processor | Scales | Overwrap machine | Temperature probe |
|---|---|---|---|---|---|---|
| 3 in 1 detergent then wipe over with alcohol based wipe | | | | | X | |
| A dilution of ampha clean then a cloth to wash down and then dried with paper towels then sanitised. | | | | X | | |
| Before and after every use it gets wiped with an anti bac wipe. We have a weekly checklist and part of that process is to calibrate the probe with boiling water and ice water | | | | | | X |
| Blue rolling sanitiser and we use a double clean method. Put the sanitiser on then clean and then repeat. We also use cling film over the weighing scales when weighing raw meat | | | | X | | |
| Boil hot water on the hob, put the end of the temperature probe that's used in the boiling water and then wipe with an antiseptic probe wipe. | | | | | | X |
| Clean before and after use. Put it in boiling water, wipe then sanitise and then put back onto the tray where the probes are kept | | | | | | X |
| Clean down with detergent and spray with sanitiser after and wipe with blue roll paper | | | | | | X |
| Cleaned in the sink with anti-bacterial washing up liquid to get the debris off then it's put in the dishwasher where it reaches 87 degrees | | | X | | | |
| Cleaned with the detergent at first then wipe with a single use de-sanitising wipe then use a sanitiser as well | | | X | X | | |

[12] The columns adjacent to each account of cleaning practices indicate with a cross which pieces of equipment the business used for dual purposes (for both raw and RTE foods).

| | Vacuum Packer | Slicer | Mixer / Food processor | Scales | Overwrap machine | Temperature probe |
|---|---|---|---|---|---|---|
| Equipment is taken apart wiped out and put in dishwasher then sprayed and left until used next | | | | X | | X |
| Equipment is taken apart and put through a dishwasher, air dried, then put back together | | | X | | | |
| Everything is washed in detergent first, then it's run through the dishwasher which is higher than 80 degrees and a sanitiser is put in the dishwasher. The bits that can't go in the dishwasher are sanitised and hand washed. | | X | | | | |
| Generally it's only used for cooked meats. However, in the rare instances when we use it for both we boil a kettle and then run the probe under the boiling water after which we wipe it down with disinfectant wipes | | | | | | X |
| It gets washed after each use. Inside it's got nylon pads and they go through the dishwasher and then it all gets sanitised. | X | | | | | |
| It would be disinfected with a pot of hot water and disinfected then sprayed with sanitiser then wiped down. Before it is used it would be sanitised again | | | | | | X |
| It's cleaned with the wipes and then they are thrown away and we also use anti-bacterial sanitizer. We've got one that conforms to all the regulations. | | | | X | | |
| It's washed in a sink then sterilised using the dishwasher and sanitiser | | | X | | | |
| It's wiped with detergent then treated with disinfectant spray and dried off with single use paper towel | | | | X | | |
| Put into dishwasher then cleaned and sanitized and then cleaned with the wipes afterwards | | | | X | | X |

| | Vacuum Packer | Slicer | Mixer / Food processor | Scales | Overwrap machine | Temperature probe |
|---|---|---|---|---|---|---|
| Separate areas for when using the equipment. Using a sanitiser and green anti-bacterial washing liquid to clean them. | | X | | | | X |
| Some go in the dishwasher and the rest are sprayed with sanitiser and left for 45mins then wiped with single use cloth | | | X | X | | X |
| Spray with sanitiser and wipe it down with a disposable cloth | | | | | X | |
| Strip it down and put it in the sink to wash with disinfectant and detergent then scrub it down and spray with antibacterial spray before re-assembling | X | | | | | |
| The bowl goes in the dish washer with sanitiser and boiling water soap and wiped | | | X | | | |
| They get fully disinfected and then checked to make sure they're clean | | | | | X | X |
| Washed down then sanitised then dried with the blue centre feed | | | | | | X |
| We clean it first and then use anti-bacteria after that. | | | X | X | | |
| We clean with detergent first then sanitise it and put the tray through the dishwasher after | | | | X | | |
| We get the bucket of water with the sani-cleanse in it, give it a wipe with that, then rinse and dry off with blue single use roll and then it's sprayed with sanitiser, left for 30 seconds then wiped down | | | | | X | |
| We put a mixing bowl on the scales so nothing touches. We use the detergent, wait for 30 seconds, wipe off then sanitise, wait for 30 seconds and wipe off | | | | X | | |
| We take it apart and hand wash in it the sink and then spray the rest of the equipment which cannot be washed in the sink with disinfectant | | | X | X | | X |
| We take it apart, spray it down put some hot water on then sanitise it. | | | | | | X |

| | Vacuum Packer | Slicer | Mixer / Food processor | Scales | Overwrap machine | Temperature probe |
|---|---|---|---|---|---|---|
| We use the detergent with hot soapy water then put sanitiser on then let it set for 10 minutes and then wipe it off | | | | | X | |
| We wash the temperature probe with hot soapy water and then use a wipe with a disinfecting cloth and leave to dry. With the scales we wash with hot soapy water and then surface spray sanitiser when dry | | | | X | | X |
| We wipe it down with a blue cloth then use diluted sanitiser. Also once a week we put it through boiling water. | | | | | | X |
| Weighing scales are layered with cling film and we use a detergent and dish washer | | | X | X | | |
| Wipe and sprayed down before use and then after we use anti-bacterial spray. The resting plate is washed in the dishwasher | | | | X | | |
| Wipe down first with a detergent then with a sanitiser and the equipment that can be placed in the dishwasher is placed in there at a higher temperature than 80 degrees | | | X | | | |
| With the mixer there is a separate bowl and utensils for RTE and raw and they are passed through the dishwasher. The main body of the mixer is washed with a disinfection spray | | | X | X | | |
| bleach domestos which we put in hot water using a bucket | | | | | X | |
| chemical spray pre-mix and blue paper cloth which is single use | | | | X | X | |
| clean it in hot soapy water and wipe with sanitiser also wipe with single use blue cloth | | | | | | X |
| cleaned down with hot anti bac soapy water and wiped with cloth. All work tops are covered with anti bac and cleaned down again after use | | | | | | X |
| dipped in soapy water and then wiped with a sanitiser | | | | | | X |

| | Vacuum Packer | Slicer | Mixer / Food processor | Scales | Overwrap machine | Temperature probe |
|---|---|---|---|---|---|---|
| dishwater at a high temp and Dettox for all surfaces and disposable cloths to wipe down surfaces. We use a santiser after the Dettox | | | X | | | |
| hot water changed every half hour with detergent, wiped with single use cloth. At the end of the day everything is stripped down, disinfected, then rinsed with boiling water to sterilise and reassembled | | | | | X | |
| only cleaned after washer goes through a full cycle therefore no chance of cross-contamination between the use of the probe we use probe wipes before and after use | | | | | | X |
| pull apart, sanitise then dishwasher | | | X | X | | |
| put in dishwasher and use disinfectant, spray with sanitiser | | | | | X | |
| sanitiser and bacterial combined spray | | | | X | | |
| sanitiser and wiped down, this is done for all things and the rest goes in dish washer | | | | | | X |
| scrubbed and sprayed with bacterial spray and put in dish washer | | | | X | | |
| scrubbed with washing up liquid and detergent then put through dish washer at high heat | | | | X | | |
| soapy water then sanitiser, then new anti bacterial spray and add water. The equipment is then wiped down with throw away paper towels | | X | | | | |
| sponged with soapy water, disinfection spray and sanitiser wipes which is done 2-3 times per day. The temperature probe is wiped with a disposable cloth and a sanitiser and put in boiling water | | | X | | | X |
| sterilised with detergent that was recommended with hot water, soak in that. There is no direct contact between raw and RTE foods | | | | X | | X |
| take apart and put in dishwasher | | | | | X | |

| | Vacuum Packer | Slicer | Mixer / Food processor | Scales | Overwrap machine | Temperature probe |
|---|---|---|---|---|---|---|
| take probe wipe between every use and make sure this is done every time it is used | | | | | | X |
| turn off machine, use sanitiser and single-use cloth to dry it | | | | | X | X |
| wash and strip down, anti bacteria degreaser, hot water then dilute for the drains and machinery | | | X | | | |
| wash down with detergent leave then sanitize for 2-3 mins then wipe with blue roll single use | | | | | | X |
| wash with detergent then spray with sanitiser and wipe | | | | X | | |
| washed then put in the dish washer. Some will use the sanitizer and then surface cleaner. it varies by equipment and size | | | | X | | X |
| we spray probe with anti bacterial disinfection spray then wipe with disposable blue roll | | | | | | X |
| we wash it in a sink with detergent to take off the debris then put through the dishwater with detergent at high heat then allow it to dry. | | | X | X | X | |
| wipe down with a single use cloth | | | | | | X |
| wipe down with probe wipe (eco lab) sanitiser, use once and throw away, can also use spray, then wipe with single-use blue cloth | | | | | | X |
| wipe thoroughly with a cloth , use sanitiser and constantly clean | | | | X | | |

Q. D3: *Please can you describe in detail the processes you go through in cleaning and disinfecting the complex equipment used for both raw and ready-to-eat foods at this site?*

**Table A2: How food businesses perceive that they ensure their cleaning/ disinfecting methods and processes are reliable in protecting against the risks of cross-contamination**

| |
|---|
| Clean as you go, sanitizing, red tongs for raw meat and raw meats are not prepared in the same area as cooked meats |
| look at sign-off paper work |
| Our menu means the grill is only used for raw, nothing is reheated |
| We do a 4 weekly check on the dishwasher to make sure it is still reaching above 85 degrees |
| It's cleaned well between use and constantly checked |
| cook fills out form on daily basis |
| Everyone's been trained do the cleaning procedures properly |
| we put the cloths in hot water add Domestos (10 capsules) and leave overnight. |
| by following fast food standard guidelines |
| have a spot check and swab checks which happen 4 times |
| ensuring staff are aware of correct procedures and have charts that are filled in and signed throughout the day |
| We use a surface probe that gives us a reading of how many bacteria are on each surface and have plenty of visual checks |
| work towards guidelines set by government |
| As far as possible we keep it separate but the big mixer we use it for both raw and RTE foods, so we check after it's cleaned |
| very vigilant and protective equip |
| We only pack cooked stuff once a week on a Monday then it's rarely used after that |
| nothing open touches the machine as raw foods are in trays, cooked meats are in sealed bags or vacuum packed and only cooked meats go on the scales |
| Gourmet foods comes in and they deal with the techniques and cleaning that we do who come in every month. |
| we've discussed the cleaning processors with the environmental health officers and they said it was fine |
| only 2 of us in kitchen so it's easy to stay on top of it |
| after each use wipe with anti septic wipes |
| It's all written and laminated on the wall |
| We make sure we clean after every use |
| as long as it's thorough there should be no problems |
| I trust my cleaning! |
| The foods are prepared in batches so we can separate the food at different times with separate areas for raw and RTE so they never have contact |
| The only raw product we'd use is meat and that's already pre-packed |
| we do as much as we can to follow procedure |
| We make sure it's properly cleaned |
| Everyone knows the standard I keep here and we keep cleanliness and protection of |

| |
|---|
| cross-contamination at a high standard. We also have charts to check it's been cleaned |
| one process at a time then washed, we cook one batch of food the whole way through, machine not constantly used |
| if it's clean then it's clean! |
| don't use  too much |
| dishwasher for one item at a time |
| The raw meat doesn't touch the scales, it's all on paper and wiped regularly with the sterilising wipes |
| We trust the training is correct and they follow procedures |
| cleaned every time after use. |
| We asked the public health inspector who approved of our methods. |
| We have all been trained in food safety and we've all been working here a long time. Things get done and everything gets cleaned to a high standard. |
| we test our equipment through swabbing and our providers come down and test the equipment. |
| I trust my 17 years in the kitchen |
| when environmental health officers came round they have never notice any problems |
| This machine is the only machine used for both raw and RTE foods so it's the same person who does it so it's kept to a routine and always done straight away after use |
| cleaning rota of raw and cooked foods is always separate |
| We follow the same procedure every time we use them when cleaning |
| we read the labels on the cleaning products and follow instructions |
| staff had food safety training and have a chart to follow |
| chef telling kitchen porter to be vigilant |
| looking at the equipment and make sure it's cleaned and rely on the chemical |
| sign off sheet |
| By using the same methods |
| food and beverage manager has regular meetings and all staff have to do COSHH training |
| We clean it constantly |
| use cloth once |
| diligence of kitchen manager on staff communication, everyone must be aware |
| SFBB and the monthly checklist |
| Daily cleaning checks. |
| make sure it's always wiped down then no problems |
| Before and after each use we wipe the probe with a probe wipe. |
| By being thorough with the process |
| We make sure we're using the right cleaning products and we also have different colour cloths for raw and RTE foods and all the staff have been trained and are aware of what equipment to use |
| We have different cloths for raw and ready-to-eat foods. |

| |
|---|
| It's recorded on our hygiene books that it needs cleaning every day. We don't use it very often for cooked food anyway |
| Cleaning rotas are all around and we make sure we stick to them and they also get checked and signed by the head of the department |
| Nothing really touches the scales just the mixing bowl anyway and that gets put in a dishwasher |
| there's no risk of contamination because raw and RTE are separate, if food did come in to contact it would be put through an oven as we always leave things in RTE state |
| We make sure it's always cleaned every time it's used and it's all recorded on our cleaning schedule |
| because of the antibacteria it kills e.coli |
| The machines are cleaned every day and we have an extensive food hygiene training program in place with regular refresher courses and updates in line with legislation. |
| It depends on the dishwasher |
| check that the kitchen porters are doing their jobs thoroughly and make sure the dishwasher is working properly. |
| The raw food would be in its own packaged atmosphere same as the ready cooked so the microwave doesn't ever come in contact. |
| it's constantly being  monitored by the head chef and the manager |
| Give it a good clean in-between raw and RTE foods |
| We always tell staff and check that everything is clean and in good condition |
| We do that with consultations through our Environmental Health Officer. |

Q: D5 *How do you make sure that these methods are equally reliable in protecting against the risks of cross-contamination as using a single piece of complex equipment for use only for raw foods or only with ready-to-eat foods*?

**Table A3: How food businesses ensure against human error during busy times**

| |
|---|
| Wear protective clothing e.g. gloves hairnets hats kitchen wipes and protective shoes |
| keep an eye on employees, working together and helping each other. Every cleaning process is written down and recorded |
| 4-6 weekly team meetings highlighting health and safety issues and procedures |
| It's a simple process in the sink then into the dishwasher and all cleaning staff are trained and there is also a daily cleaning schedule that's checked daily. We are also audited every 4 weeks. |
| I always pre slice so that we have lots ready- if it gets busy hopefully there is not much to do |
| separate containers for raw foods |
| There's only two of us here and we can watch each other. |
| only have 2 members of staff who handle duties |
| only 2 members who handle raw and RTE foods |
| yearly COSHH training and constant monitoring |
| one manager aware to be vigilant every busy shift, complete diligence and following procedures, re-educate staff on correct practice |
| We have 2 people who are constantly monitoring the cleanliness of the site |
| being vigilant and we only use probe during quiet times. |
| There's always a checklist to be done as things go along. After it has been used it's checked by a second person |
| make sure we stay on top of the cleaning |
| There's only 2 of us working here and we've had over 60 years experience in the meat industry |
| We've got rules in place that staff must follow and we have lots of training |
| I have my eye on everything that happens in the kitchen as we work and use the practices daily |
| all the processes are written down and laminated on the wall. It's mentioned to staff constantly and the chef's have to sign a record everyday to log that it's done properly. |
| everything is managed and controlled and it's a small kitchen so easy to clean equipment etc |
| daily monitoring |
| I'm the only chef and have been doing this for 15 years. |
| delegate and make sure people know their jobs |
| The procedure is written down so staff can double check if they have any issues |
| you can't! |
| we check each others procedures, done thoroughly, food prep done in sessions, don't work everyday can take time, bake one day and other day meat prep for example |
| There's only me and my business partner that do any cooking and we've been cooking 25+ years. We also have SFBB booklet. Teach all new staff how to do it well and have a clean as you go approach. |
| we have a process for cleaning and all staff are trained |

| |
|---|
| wash hands regularly, wear gloves and change them between customers so we don't handle money with the same gloves |
| Have members of staff who all have their certificate, everyone knows to check equipment and make sure it's been cleaned |
| the process is always followed |
| I'm in kitchen so I do it |
| follow process |
| plan ahead |
| Just take your time and make sure we do it properly, it's never too busy anyway |
| Pre-prepared so no risk of busy times |
| only two people use it and we know what to do, documented times to clean it in the books |
| We  monitor its use and make sure all staff are full trained up on food safety and hygiene |
| We don't really have hectic periods so when things need doing we make sure they're done. |
| we have a supervisor on site and we're quite a small team so we correct people on the spot. |
| everyone is trained to do it and I watch them closely |
| through the HACCP |
| watching what people are doing. |
| We have a sheet that I check daily and make sure that the wrapping machine is cleaned |
| double checked with set daily list |
| We're all fully qualified and there are sheets on the wall explaining how to clean them |
| I do it myself |
| only qualified personnel can handle food so owner or manager is always on duty |
| we train staff well |
| kitchen checks and cleaning rotas |
| don't use it too much so it's not a big issue |
| The cleaning equipment are always to hand and readily available |
| we do briefings before each shift |
| company has high standards and training is rigorous |
| we clean it every morning and when we close |
| instilling confidence to the staff to wait longer to clean equipment as we'd rather they wait a minute longer and have safe food and equipment |
| We have a small team and a manager and as a manager it's my job to make sure everything is thoroughly cleaned and that the checklist is followed |
| Using probe wipes |
| thorough training and observe the work of staff |
| I always do it before and after use with gloves on |
| We have set standard practices and only my wife and I touch the food. We limit it. |
| We usually have set members of staff that are allocated to different jobs in terms of cleaning and we also have a cleaning checklist to follow |

| |
|---|
| We educate the girls to use the pink for raw foods and blue for ready-to-eat foods. We have two different containers to put the probe in after use with either raw and RTEs |
| Training staff to intermediate level so level 3 and most staff are level 4. Also we record when we've cleaned it. |
| Cleaning rotas and plenty of staff and kitchen porters that help as well |
| Prep is done in the morning and afternoon so during busy times no one is using the scales |
| no change, exactly the same process, busy times are the same as quiet |
| We always have a supervisor in the kitchen and they're responsible for things like that getting done |
| our staff just do it while they cook and we also have staff training |
| We have an extensive food hygiene training program in place and we maintain this training with regular refresher courses and updates in line with legislation. |
| procedures are in place and the equipment is not used during busy periods |
| Keep your eye on them. |
| The staff are trained and we have shift managers to ensure that staff stick to the standards |
| Staff are all fully trained and we have many probes - not using the same one over and over again. |
| We all know to wipe the probe and we have all been trained, we also have a Health and safety booklet which we all got briefed on at the start |
| We make sure that we are careful with the food and that it's healthy and clean |
| Strict training policy which we make sure we adhere to procedures. It's made sure it's cleaned after each session and not used until it's cleaned. |

Q:D6 *In terms of the alternative methods you've described, how do you insure against human error during busy times?*

# Appendix 2: Case study interview schedule and observation checklist

| Interview Schedule | |
|---|---|
| **A. Dual use equipment used**<br><br>a1 Which pieces of equipment in your business are used for both raw and RTE food? (this will provide a check that our records are correct) | |
| **B. Reasons for dual use**<br><br>For each piece of equipment –<br><br>b1 Why do you have only 1 piece of equipment for both raw and RTE?<br><br>• Probe – space constraints, costs, confidence in cleaning procedures | |
| **C. Staffing**<br><br>C1 How many staff do you employ?<br><br>• Probe: numbers of staff mid week and numbers of staff at the weekend or other busy times<br><br>C2 How many customers do you get during your busy periods? (eg number per hour?)<br><br>• Probe on how busy it can be, do there tend to be queues of people waiting? | |
| **D. Cleaning stages**<br><br>For each piece of equipment<br><br>D1 How do you clean the equipment?<br><br>D2 Why do you use that particular technique?<br><br>D3 Who is responsible for cleaning? | |
| **E. Cleaning time**<br><br>For each piece of equipment<br><br>E1 When is the equipment cleaned? | |

| | |
|---|---|
| • Probe on whether time separation used / or cleaning on an ongoing basis<br><br>E2 How often is equipment cleaned each day?<br><br>E3 How long does each stage of cleaning take? (differentiate disassembly, cleaning of debris and disinfection with heat or chemicals | |
| **F. Use of sanitisers / chemical disinfectants / ozone**<br><br>F1 Thinking about sanitisers and chemicals – which products do you use?<br><br>F2 In which form are the sanitisers or chemicals used?<br><br>Probe on:<br>➢ whether they are in liquid form or on a wipe<br>➢ do they require dilution<br>➢ what dilution levels used<br><br>F3 How are the sanitisers / chemicals applied?<br><br>Probe on:<br>• cloths used<br>• wiping techniques – single or multiple direction wiping/smearing/rubbing | |
| **G Use of heat disinfection**<br><br>G1 Are heat disinfection methods used?<br><br>Probe:<br>• Which methods used (boiling water / steam / dishwasher)<br>• What temperatures used<br>• For what duration | |
| **H Hand Washing**<br><br>H1 Which products do you use to wash your hands<br><br>H2. What technique do you use to wash your hands? | |

| **Observation Checklist**<br>Observe the following cleaning stages/processes and order in which conducted | | **Note order of activities** |
|---|---|---|
| **AA. Contextual observations**<br><br>Eg. Note whether other activities occurring on the premises such as answering the phone, dealing with customers, handling food, cleaning etc – moving back and forth between such tasks<br><br>Note number and location of sinks for handwashing and for other activities. Both hot and cold water? Are taps touched by hand or automated taps?<br><br>Note handwashing – when hands washed, how often, products used and techniques used<br><br>Other observations<br><br>**A. Disassembly of equipment**<br><br>➢ How much and which elements of the equipment are removed and cleaned<br><br>➢ Does food come in contact, either directly or indirectly via staff touch, with non- cleaned parts of complex equipment | | |
| **B. Washing stage (for removal of debris)**<br><br>Gather as much 'rich' information as possible<br><br>➢ Methods used (eg submerged in water, wiped clean, approx temperature of water eg. warm/boiling etc)<br><br>➢ Cleaning detergents/chemicals used<br><br>➢ How detergents/chemicals applied<br><br>➢ Use of cloths (are they new cloths, single use cloths or if not for how long/how many times are cloths used? Where are cloths stored – do they toch other cloths?)<br><br>➢ Technique used to clean (rubbing, wiping, smearing). | | |

| | | |
|---|---|---|
| **C. Disinfection stage**<br><br>**Use of sanitisers / chemical disinfectants / ozone**<br><br>➢ Are they used<br><br>➢ How are they used/applied (sprayed / wiping techniques – single or multiple direction wiping/smearing/rubbing)<br><br>➢ In which format (eg disposable single wipe products / multiple use chemical wipes impregnated with chemical / other wipes used)<br><br>➢ Contact time of chemical on equipment<br><br>➢ Are the chemicals in liquid format<br><br>➢ Do they require dilution<br><br>➢ What concentration levels used<br><br>➢ Action following chemical clean (eg sprays such as dettox are a no rinse spray vs bleach does require rinsing)<br><br>➢ Possible issue – after cleaning how soon is equipment used (no rinse sprays may take longer to 'kill' bacteria than bleach products)<br><br>**Use of heat disinfection**<br><br>➢ Which methods used (boiling water / steam / dishwasher)<br><br>➢ What temperatures used<br><br>➢ For what duration | | |
| **Drying post cleaning**<br><br>➢ Techniques used (left out to dry/dried by dishwasher)<br><br>➢ Materials used (tea towels, single use drying wipes) | | |

# Appendix 3: Survey Questionnaire

## Alternative measures to control the cross-contamination risk of *E. coli* O157

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| Quota category | | Number of interviews to achieve | Quota category | Number of interviews to achieve | Number of interviews to achieve |
|---|---|---|---|---|---|
| **SECTOR** | Butchers | 90 | **SAMPLE TYPE** | 1. Previous 5094 'recontact' sample | 200 |
| | Delis and other specialist food retail | 40 | | 2. New sample | 200 |
| | Food retail stores | 20 | | | |
| | Bakers | 20 | | | |
| | Hotels | 25 | | | |
| | Restaurants | 70 | | | |
| | Pubs and Bars | 70 | | | |
| | Catering | 40 | | | |
| | Food manufacturing | 25 | | | |

# S Screener

ASK TELEPHONIST

S1 **Good morning / afternoon. My name is NAME and I'm calling from IFF Research on behalf of the Food Standards Agency. Please can I speak to** [TEXT SUB IF SAMPTYPE2=2: **NAME**] [IF SAMPLE TYPE=2 OR SAMPTYPE2=1: **the owner or manager or the most senior person responsible for food safety at this site**]**?**

ADD IF NECESSARY: **We need to speak to someone based at this site, not at head office. We are interested in activities at this location. So we need to speak to** [TEXT SUB IF SAMPTYPE2=2: **NAME**] [IF SAMPLE TYPE=2 OR SAMPTYPE2=1: **the owner or manager or the most senior person responsible for food safety at this site**].

ADD IF NECESSARY: **We are conducting a research project for the Food Standards Agency to consider practices used to prevent the cross-contamination of E. coli O157 at this site. We would like to ask** [TEXT SUB IF SAMPTYPE2=2: **NAME**] [IF SAMPLE TYPE=2 OR SAMPTYPE2=1: **the owner or manager or the most senior person responsible for food safety at this site**] **about these controls and the practicalities of implementing them.**

ADD IF NECESSARY: **We can reassure you that none of the answers you give will be linked to your company, unless you give explicit permission, and this research will only be used for research purposes. We are not ringing to monitor or scrutinise your methods, we simply want to better understand the types of controls you have in place to prevent cross-contamination.**

| | | |
|---|---|---|
| Transferred | 1 | CONTINUE |
| Hard appointment | 2 | MAKE APPOINTMENT |
| Soft Appointment | 3 | |
| Refusal | 4 | CLOSE |
| Refusal – company policy | 5 | |
| Refusal – Taken part in recent survey | 6 | |
| Nobody at site able to answer questions | 7 | |
| Not available in deadline | 8 | |
| Engaged | 9 | |
| Fax Line | 10 | |
| No reply / Answer phone | 11 | |
| Residential Number | 12 | |
| Dead line | 13 | |
| Company closed | 14 | |
| Send reassurance Email | 15 | Collect email address and make appointment |

ASK ALL

S2 **Good morning / afternoon, my name is NAME, calling from IFF Research, an independent market research company. We're conducting a survey on behalf of the Food Standards Agency to consider effective controls against the cross-contamination of E. coli O157. The findings from this research will be used to inform whether alternative controls to those currently recommended by the FSA can be formally adopted to prevent the cross-contamination of E-coli O157.**

**Can I just check, are you the most senior person responsible for food safety at this site?**
[TEXT SUB IF SAMPTYPE2=2: **We spoke to you last year about the guidance the FSA had produced on controlling E-coli O157 cross-contamination which was published in February 2011. At the end of the interview, you kindly agreed to be contacted about any future related research.**]

*ADD IF NECESSARY:* **The survey will be carried out according to the Market Research Society's Code of Conduct and the Data Protection Act which guarantees absolute confidentiality and anonymity of responses. The Food Standards Agency will not be made aware of your participation in the research and all responses made will remain confidential, unless you give explicit permission. This research is only to be used for research purposes**

| | | |
|---|---|---|
| Continue | 1 | CONTINUE |
| Referred to someone else at establishment<br><br>NAME_____<br><br>JOB TITLE_____ | 2 | TRANSFER AND RE-INTRODUCE |
| Hard appointment | 3 | MAKE APPOINTMENT |
| Soft appointment | 4 | |
| Refusal | 5 | THANK AND CLOSE |
| Refusal – company policy | 6 | |
| Refusal – taken part in recent survey | 7 | |
| Not available in deadline | 8 | |
| Send Reassurance Email | 9 | Collect email address and make appointment |

ASK ALL

S3 **This call may be recorded for quality and training purposes only.**

REASSURANCES TO USE IF NECESSARY

The interview will take around 10 minutes to complete.

Please note that all data will be reported in aggregate form and your answers will not be reported to our client in any way that would allow you to be identified.

If respondent wishes to confirm validity of survey or get more information about aims and objectives, they can call:

- **MRS: Market Research Society on 0500396999**
- **IFF: Mark Tweddle: 0207 250 3035**

ASK ALL

S4 **We need to speak with businesses that handle / sell both raw and ready-to-eat foods.**

**By raw, we mean either raw meat or raw fruit, vegetables or salad which have not already been washed and labelled as RTE.**

**By ready-to-eat foods we mean foods that are handled, unwrapped and / or prepared on site. These are foods that will not be cooked or reheated before being eaten and include foods such as cooked meats, sandwiches, pies, cheese, salads and desserts**

[TEXT SUB IF SAMPTYPE2=2: **When we spoke to you last, you told us that you handled BOTH raw and ready-to-eat foods, is this still the case?**] [TEXT SUB IF SAMPLE TYPE=2 OR SAMPTYPE2=1: **Can I just check do you handle / sell BOTH raw and ready-to-eat meals?**]

*READ OUT. CODE ONE ONLY*

| | | |
|---|---|---|
| Yes – handle both raw and ready-to-eat foods at this site | 1 | CONTINUE |
| No – handle just raw foods | 2 | SAMPTYPE=2 OR SAMPTYPE2=1:THANK AND CLOSE |
| No – handle just ready-to-eat foods | 3 | |
| No – handle neither raw nor ready-to-eat foods | 4 | SAMPTYPE2=1: ASK S5 |

ASK IF SAMPLE TYPE2=2 & S4=2-4.

S5 **Why do you no longer handle and / or sell both raw and ready-to-eat foods at this site?**

| WRITE IN | | |
|---|---|---|
| Inability to follow the FSA guidance on E. coli O157 | 1 | |
| Don't know | 2 | |
| Refused | 3 | |

DISPLAY IF THANK AND CLOSE AT S4 (S4=2-4)

**Unfortunately you do not meet the criteria to take part today as we are only looking to speak to establishments that handle raw and RTE foods. Thank you for your time today.**

ASK ALL

S6 **And do you use complex equipment at this site?**

**By complex equipment we mean equipment that is made up of many surfaces and components and cannot in its entirety be subject to heat disinfection. For example the complex equipment cannot entirely be placed in a commercial dishwasher.**

ADD IF NECESSARY: **This could include things like slicers, mincers, food processors, weighing scales, vacuum packers, overwrapping machines and temperature probes.**

INTERVIEWER NOTE: Cash machines and chip-and-pin machines do not count as complex equipment.

| | | |
|---|---|---|
| **Yes** | 1 | |
| **No** | 2 | THANK AND CLOSE |
| **Don’t know** | 3 | THANK AND CLOSE |

DISPLAY IF THANK AND CLOSE AT S6 (S6=2 OR 3)

**Unfortunately you do not meet the criteria to take part today as we are only looking to speak to establishments that use complex equipment. Thank you for your time today.**

# A Business characteristics

ASK IF SAMPLE TYPE=2 OR SAMPTYPE2=1
**I'd like to start by asking a few questions about the type of work that you do at this site.**

ASK ALL
A1 **Firstly, how many employees in total do you have at this site? Please include yourself and all full time and part time employees on the payroll.**

| WRITE IN | | |
|---|---|---|
| Don't know | 1 | |

IF DON'T KNOW EXACT NUMBER – PROMPT WITH RANGES

| | |
|---|---|
| 5 staff or fewer | 1 |
| Between 6 and 10 staff | 2 |
| Between 11 and 19 staff | 3 |
| Between 20 and 49 staff | 4 |
| 50 or more staff | THANK AND CLOSE |
| Don't Know | 5 |

IF A1 OR A1RAN=50 OR MORE
**Unfortunately we are looking to speak with sites where fewer than 50 employees work meaning that you do not meet the criteria to take part. Thank you for your time today.**

A1Dum **DUMMY VARIABLE, DO NOT ASK - SIZEBAND**

| | | |
|---|---|---|
| 5 staff or fewer | 1 | |
| Between 6 and 10 staff | 2 | |
| Between 11 and 19 staff | 3 | |
| Between 20 and 49 staff | 4 | |

IF A1RAN=DK TAKE SIZEBAND FROM SAMPLE

ASK IF SAMPLE TYPE=2 OR SAMPTYPE2=1

A2 **Is the nature of this business...?**

*READ OUT. SINGLE CODE*

| | | |
|---|---|---|
| Single site | 1 | |
| One of multiple sites (e.g. a chain) | 2 | |
| A mobile food outlet | 3 | |
| A market stall | 4 | |
| Other (specify) | 5 | |
| Don't know | 6 | |
| Refused | 7 | |

ASK IF SAMPLE TYPE=2 OR SAMPTYPE2=1

A3 **What is the first language of the owner / manager?**

*SINGLE CODE – PROMPT AS NECESSARY*

| | | |
|---|---|---|
| English | 1 | |
| Bengali | 2 | |
| Hindi | 3 | |
| Sylheti | 4 | |
| Urdu | 5 | |
| Cantonese | 6 | |
| Mandarin | 7 | |
| Other (specify) | 8 | |
| Don't know | 9 | |

ASK IF SAMPLE TYPE=2 OR SAMPTYPE2=1

A4 **I have** [INSERT SIC DESCRIPTION FROM SAMPLE] **as a description of your business's activity? Does that sound about right?**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |

ASK IF DISAGREE WITH SIC DESCRIPTION (A4=2)

A5 **What is the main activity of your business?**

*INTERVIEWER PROBE FOR THE FOLLOWING - START WITH FIRST PROBE AND ONLY USE THE OTHERS IF NECESSARY TO GET CLEAR INFORMATION*

- What would you type into a search engine to find an organisation like yours online?
- What is the main product or service of this establishment?
- What exactly is made or done at this establishment?

| |
|---|
| WRITE IN<br>ALLOW REFUSED |

ASK IF RESTAURANTS OR DELIS FROM SAMPLE

A6 **What is the nationality of the food sold in the restaurant or cafe that you work in?**

*INTERVIEWER NOTE IF THEY SELL MORE THAN ONE NATIONALITY OF FOOD: ADD IF NECESSARY:*

**We are interested in the nationality of food which you sell most of**

*DO NOT READ OUT. SINGLE CODE*

| | | |
|---|---|---|
| British | 1 | |
| Chinese | 2 | |
| Indian | 3 | |
| Thai | 4 | |
| Mexican | 5 | |
| Italian | 6 | |
| Spanish | 7 | |
| French | 8 | |
| Turkish | 9 | |
| Greek | 10 | |
| ‘Modern European’ | 11 | |
| Other (specify) | 12 | |
| Don’t know | 13 | |

# B Equipment used

ASK ALL

B1 **I'd now like to ask about the types of complex equipment that are used at this site. So do you use any of the following...?**
*READ OUT. CODE ALL THAT APPLY*

INTERVIEWER NOTE: Cash machines and chip-and-pin machines do not count as complex equipment.

| | | |
|---|---|---|
| **Vacuum packer** | 1 | |
| **Slicer** | 2 | |
| **Mincer** | 3 | |
| **Mixer or food processor** | 5 | |
| **Weighing Scales** | 6 | |
| **Overwrapping machine** | 7 | |
| **Temperature probe** | 8 | |
| **Other complex equipment 1 (PLEASE SPECIFY)** | 9 | |
| **Other complex equipment 2 (PLEASE SPECIFY)** | 10 | |

B1Dum **DUMMY VARIABLE, DO NOT ASK**

| | | |
|---|---|---|
| USE COMPLEX EQUIPMENT | 1 | B1=1-10 |

# C Use of complex equipment

DP INSTRUCTION: REPEAT C1 TO C3 FOR EACH PIECE OF COMPLEX EQUIPMENT MENTIONED AT B1

ASK BUSINESSES THAT USE COMPLEX EQUIPMENT (B2DUM=1)

C1 **And could you tell me whether you have a single** [INSERT PIECE OF EQUIPMENT FROM B1] **or more than one?**

| | | |
|---|---|---|
| One | 1 | |
| More than one | 2 | |
| DO NOT READ OUT: Don't know | 3 | |

ASK BUSINESSES THAT USE COMPLEX EQUIPMENT (B2DUM=1)

C2 **And do you ever use the same single** [INSERT PIECE OF EQUIPMENT FROM B1] **for both raw and ready-to-eat foods?**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |
| DO NOT READ OUT: Don't know | 3 | |

ASK IF HAVE MORE THAN ONE PIECE OF EQUIPMENT AND DUAL PURPOSE (C1=2 AND C2=1)

C3 **Why aren't the** [INSERT PIECE OF EQUIPMENT FROM B1]**s separated out for use only for raw foods or only with ready-to-eat foods at this site?**
*DO NOT READ OUT. CODE ALL THAT APPLY*

| | | |
|---|---|---|
| Haven't ever thought about separating them out | 1 | |
| More efficient to use for both raw and ready-to-eat | 2 | |
| It is too difficult to separate ( Specify why) | 3 | |
| No need to – equipment is cleaned between uses | 4 | |
| Other (SPECIFY) | 5 | |
| Don't know | 6 | |

# D Cleaning, disinfecting and other controls to prevent cross-contamination

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)
**I'd now just like to ask about the measures you have in place to prevent E-coli O157 cross-contamination.**
**You told us earlier that you use complex equipment at this site and that the same single piece of equipment can be used when handling both raw and ready-to-eat foods at this site.**

DP INSTRUCTION: REPEAT D1 TO D2 FOR EACH PIECE OF COMPLEX EQUIPMENT MENTIONED AT B1 THAT IS USED FOR BOTH RAW AND READY-TO-EAT FOODS (EACH C2=1)

D1 **What products and materials are used to clean and disinfect the** [INSERT PIECE OF EQUIPMENT FROM B1 THAT IS USED FOR BOTH RAW AND RTE FOODS C2=1]**s at this site?**
*DO NOT READ OUT. CODE ALL THAT APPLY*

| | | |
|---|---|---|
| Detergents | 1 | |
| Disinfectants | 2 | |
| Sanitisers | 3 | |
| Non-chemical disinfection – hot water higher than 80°C | 4 | |
| Non-chemical disinfection – steam cleaning | 5 | |
| Disposable, single use cloths | 6 | |
| Dishwasher at high temperature (above 80°C) | 7 | |
| Dishwasher at lower temperature combined with a chemical disinfectant | 8 | |
| Ozone cleaning | 9 | |
| Plasma cleaning | 10 | |
| Other (SPECIFY) | 11 | |

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

D2 **And do you use any of the following to clean and disinfect the** [INSERT PIECE OF EQUIPMENT FROM B1 THAT IS USED FOR BOTH RAW AND RTE FOODS C2=1]**s...?**

DP INSTRUCTION: DISPLAY CODES NOT SELECTED AT D1 (EXCLUDING OTHER)

*READ OUT. CODE ALL THAT APPLY*

| | | |
|---|---|---|
| Detergents | 1 | |
| Disinfectants | 2 | |
| Sanitisers | 3 | |
| Non-chemical disinfection – hot water (higher the 80°C) | 4 | |
| Non-chemical disinfection – steam cleaning | 5 | |
| Disposable, single use cloths | 6 | |
| Dishwasher at high temperature (above 80°C) | 7 | |
| Dishwasher at lower temperature combined with a chemical disinfectant | 8 | |
| Ozone cleaning | 9 | |
| Plasma cleaning | 10 | |
| DO NOT READ OUT: None of the above | 11 | |

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

D3 **And please can you describe in detail the processes you go through in cleaning and disinfecting the complex equipment used for both raw and ready-to-eat foods at this site?**
*PROBE FOR DETAIL*

*INTERVIEWER NOTE: The respondent's answer should cover all types of complex equipment that are used for <u>BOTH</u> raw and ready-to-eat foods.*

| |
|---|
| WRITE IN<br>ALLOW REFUSED/DK |

D4 **Moved to after D10**

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

D5 **How do you make sure that these methods are equally reliable in protecting against the risks of cross-contamination as using a single piece of complex equipment for use only for raw foods or only with ready-to-eat foods?**

| |
|---|
| WRITE IN<br>ALLOW REFUSED/DK |

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

D6 **In terms of the alternative methods you've previously described, how do you insure against human error during busy times?**

| |
|---|
| WRITE IN<br>ALLOW REFUSED/DK |

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

D7 **Do you have any evidence as to how reliable these methods are in protecting against cross-contamination when using complex equipment for both raw and ready-to-eat foods at this site?**

ADD IF NECESSARY: **Has it been tested in a lab or in any other way?**

| | | |
|---|---|---|
| Yes (specify) | 1 | |
| No | 2 | |
| Don't know | 3 | |

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

D8 **Are there any other methods for protecting against cross-contamination when using the same complex equipment for both raw and ready-to-eat foods that you are aware of but are perhaps not able to practice currently?**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |
| Don't know | 3 | |

ASK IF AWARE OF ALTERNATIVES (D8=1)

D9 **What are these other methods that you are aware of?**

| |
|---|
| WRITE IN<br>ALLOW REFUSED/DK |

ASK IF AWARE OF ALTERNATIVES (D8=1)

D10 **Do you have any evidence as to how reliable these methods are in protecting against cross-contamination?**

ADD IF NECESSARY: **Has it been tested in a lab or in any other way?**

| | | |
|---|---|---|
| Yes (specify) | 1 | |
| No | 2 | |
| Don't know | 3 | |

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

D4 **And do you use any of these following controls...?**

*READ OUT. CODE ALL THAT APPLY*

| | | |
|---|---|---|
| Handling of raw and ready-to-eats foods at different times of the day | 1 | |
| Separation of staff handling raw and ready-to-eats foods | 2 | |
| Disposable protective clothing e.g. gloves, aprons, hairnets | 3 | |
| Tongs and other utensil for handling food | 4 | |
| Recognised hand washing techniques (such as Department of Health or NHS) | 5 | |
| Separate hand washing basins for staff handling raw and ready-to-eats foods | 6 | |
| Non-hand-operable taps | 7 | |
| Single use towels or hand driers | 8 | |
| Clean-as-you-go approach in relation to packaging materials | 9 | |
| HACCP plan (including SFBB, Cooksafe and Safe Catering)<br>INTERVIEWER NOTE: HACCP stands for “Hazard Analysis and Critical Control Point” and SFBB stands for “Safer Food, Better Business” | 10 | |
| Other (SPECIFY) | 11 | |
| DO NOT READ OUT: None of the above | 12 | |

# E Re-contact

ASK IF DUAL USE COMPLEX EQUIPMENT (C2=1)

E1 **This study is being funded by the Food Standards Agency (FSA) and is being used by the FSA to investigate whether there are alternative controls to the separation of complex equipment for raw and ready-to-eat foods that are as effective at preventing E-coli O157 cross-contamination. The FSA and its contractors may like to re-contact you about any alternative controls you already have in place to further discuss these measures in more detail. Would you be willing for this to happen?**

ADD IF NECESSARY: **The FSA's contractors are IFF Research and the University of Westminster.**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |

ASK IF HAVE EVIDENCE (D7=1) OR (D10=1)

E2 **Earlier you mentioned that you have access to evidence relating to the reliability of alternative methods in protecting against cross-contamination. Can you point us where to find this evidence and/or can you send us this evidence to share with the FSA?**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |
| Don't know | 3 | |

ASK IF WILLING TO SHARE EVIDENCE (E2=1)

E3 **Please send any links or documents of this evidence to:**

| |
|---|
| Mark.Tweddle@IFFResearch.com |

ASK IF HAPPY TO BE RECONTACTED (E1=1)

E4 **In order to carry out this future research, your contact details may be linked to the answers you have given in this survey. Would you be willing for this information to be passed onto the FSA or an organisation acting on their behalf?**

*INTERVIEWER ADD IF NECESSARY:* **We would only pass on your information onto the FSA or another research company doing legitimate research on behalf of the Agency, your interview data would never be passed to anyone else or used for commercial purposes.**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |

IF SEPARATE USE OF COMPLEX EQUIPMENT (C2=2 OR 3)

E4a **This study is being funded by the Food Standards Agency (FSA) and the purpose is to investigate whether there are alternative controls to the separation of complex equipment for raw and ready-to-eat foods that are as effective at preventing E-coli O157 cross-contamination. However, you have indicated that you already separate your complex equipment between raw and ready-to-eat foods so those are all the questions I have for you today.**

**The FSA and its contractors may like to ask further questions regarding this or invite you to take part in future research on the subject. Would you be willing for this to happen?**

ADD IF NECESSARY: **The FSA's contractors are IFF Research and the University of Westminster.**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |

ASK IF HAPPY TO BE RECONTACTED (E4A=1)

E4b **In order to carry out this future research, your contact details may be linked to the answers you have given in this survey. Would you be willing for this information to be passed onto the FSA or an organisation acting on their behalf?**

*INTERVIEWER ADD IF NECESSARY:* **We would only pass on your information onto the FSA or another research company doing legitimate research on behalf of the Agency, your interview data would never be passed to anyone else or used for commercial purposes.**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |

ASK ALL

E5 **And sometimes it is necessary to call people back to make sure the answers we have recorded are correct. Are you happy for us to call you back if needed?**

*REASSURE IF NECESSARY:* **Your details will only be used to call you back regarding this particular study.**

| | | |
|---|---|---|
| Yes | 1 | |
| No | 2 | |

IF CONSENT TO RECONTACT (E1=1 OR E4=1 OR E4A=1 OR E5=1)

E6 **And could I just check, is [NUMBER] the best number to call you on?**

| | | |
|---|---|---|
| Yes | 1 | |
| No - write in number | 2 | |

| | |
|---|---|
| Name:<br>RECORD DETAILS OF RESPONDENT WHO COMPLETED INTERVIEW | |
| Job title: | |
| Email address: | |

ALLOW REFUSED FOR EACH

ASK ALL

| |
|---|
| THANK RESPONDENT AND CLOSE INTERVIEW |

Finally I would just like to confirm that this survey has been carried out under IFF instructions and within the rules of the MRS Code of Conduct. Thank you very much for your help today.