

Not washing hands with soap after touching meat, fish and poultry

Area of research interest: [Behaviour and perception](#)

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Summary

Kitchen Life 2 explored meal occasions that involved the preparation of both raw and cooked meat, fish, and poultry (MFP). Where quantitative data from filming is reported (where video footage has been coded and counted), the results include both cooked and raw MFP. In qualitative elements of the study (case studies, behavioural analysis) the results focus purely on raw MFP. “Raw” or “raw/cooked” are clearly stated throughout this chapter.

Overall, in households, 26% of meal occasions (80) where MFP (raw and cooked) was prepared involved someone not washing their hands for at least 45 minutes during the meal occasion, and 44% of occasions (136) where MFP (raw/cooked) was prepared involved someone washing their hands without soap. Hands were washed with soap on 39% of meal occasions where MFP (raw/cooked) was prepared (119) ([footnote 1](#)).

In food business operators (FBOs), 25% of meal occasions (45) where MFP (raw and cooked) was prepared involved staff not washing their hands for at least 45 minutes during the meal occasion, and 39% of occasions (70) where MFP (raw/cooked) was prepared involved staff washing hands without soap. Hands were washed with soap on 37% of meal occasions (66), and 14% of occasions (26) involved staff wearing plastic gloves ([footnote 2](#)) ([footnote 3](#)).

Handwashing with soap after touching raw meat, fish, and poultry (MFP) is an important way to prepare food hygienically and reduce the risk of microbial cross-contamination.

During the Kitchen Life 2 (KL2) study, households and food business operators (FBOs) were observed to wash their hands with soap, briefly rinse their hands (with water only), and not wash their hands after handling raw MFP. Additionally, touching other kitchen items after touching raw MFP was frequently observed.

There were a variety of factors that influenced washing hands with soap after touching raw MFP.

In households, the key influences were:

- **unconscious habits** around handwashing, and **emotionally driven cognitive effects**, such as tiredness and distraction which were generally barriers to washing hands with soap (Automatic motivation).
- **affective processes**, such as disgust, which was an enabler of washing hands with soap (Automatic motivation).

These were reinforced by the following contextual factors [\(footnote 4\)](#):

- **beliefs about consequences** and the high risk of foodborne disease encouraged good handwashing practices, but where participants perceived the risks to be low, it discouraged good practice (Reflective motivation).
- **beliefs about what constitutes effective handwashing** (for example, believing that a quick rinse was 'good enough'), which acted as a barrier to washing hands with soap (Reflective motivation).
- **an individual's identity**, such as being a good parent or having high personal hygiene standards, which was an enabler of washing hands with soap (Reflective motivation).

In FBOs, the key influences were:

- **unconscious habits** including **wiping hands on a tea towel** rather than handwashing which acted as a barrier to washing hands with soap. Whether **handwashing with soap routines** were established in the business was particularly influential and could act as a barrier or enabler of the behaviour (Automatic motivation).
- the **layout of the kitchen**, together with the **busyness of FBOs**, and the **time taken to wash hands** acted as a barrier to washing hands with soap (Physical opportunity).

These were reinforced by the following contextual factors [\(footnote 5\)](#):

- Beliefs about **professional identity**, including being compliant with basic food safety requirements, which enabled washing hands with soap. However, management also assumed (rather than checked) that hands were washed with soap when preparing raw MFP, which acted as a barrier to washing hands with soap in some FBOs (Reflective motivation).
- **social norms** which could be a barrier or enabler of washing hands with soap. FBOs often had a culture of either handwashing regularly or not often at all, depending on the norms present within the business kitchen (Social opportunity).

Behaviours to target for potential interventions

For households and FBOs, the desired behaviour (that is, the behaviour that households and FBOs should do to improve food safety) is to **thoroughly wash hands with soap after preparing raw MFP**.

For households, this could be enabled by **preparing raw MFP as a single task** rather than multi-tasking, which increases the risks of cross-contamination and requires multiple handwashes.

For FBOs, a further behaviour to target was to stop staff wiping hands on tea towels and cloths (in place of washing hands), as staff in KL2 used cloths as an easier alternative to handwashing. For this reason, interventions on handwashing need to be considered and designed alongside interventions to prevent '[Reusing a tea towel or cloth for multiple purposes](#)'.

Background

FSA [guidance](#) highlights that cross-contamination of bacteria between raw and cooked food is thought to be the cause of most foodborne infections. The guidance highlights that handwashing with soap after touching raw meat, fish and poultry (MFP) is an important way to prepare food hygienically and reduce the risk of microbial cross-contamination.

The [literature review](#) conducted as part of the Kitchen Life 2 (KL2) project has explored handwashing in the context of households and food business operators (FBOs).

In households, whilst there is an acknowledgement among household members that handwashing is an important behaviour to protect against foodborne illness, there is existing evidence that handwashing guidelines are not followed consistently, or correctly ([footnote 6](#)). Research indicates there is likely to be overclaiming self-reported handwashing behaviours, as observational studies suggest much lower frequencies ([footnote 7](#)). Research also indicates there are high rates of touching other surfaces whilst cooking and preparing food, without proper decontamination. These surfaces include frying pan handles, taps, cupboards, and refrigerator doors ([footnote 8](#)).

In FBOs, one study estimated that 7.4% of chefs and caterers did not always wash their hands immediately after handling raw fish, meat, or poultry ([footnote 9](#)). More generally, there is inconsistent adherence to hand hygiene standards in FBOs, with food handlers often only rinsing their hands under running water without soap ([footnote 10](#)).

In the KL2 study, not washing hands with soap after touching raw MFP was identified as a priority behaviour and one of the highest risks identified by the FSA's risk assessment team. Consequently, it was selected as a behaviour to explore in depth.

This chapter uses the KL2 data to understand hand washing behaviour after touching MFP (raw/cooked) in the study, whether and how hands were washed, the factors affecting this and identify behaviours that could be the focus of future intervention research.

FSA guidance on handwashing

FSA advice on [cleaning](#) and guidance on [cross-contamination](#) advises households to wash hands with warm soapy water after touching raw food and before handling ready-to-eat food. Where access to warm, soapy water is not available (for example at a picnic), the FSA advise using hand-sanitising wipes or gels to disinfect hands before handling food.

In the [Safer Food, Better Business](#) caterer pack ([Safe Catering guidance](#) for businesses in Northern Ireland) the FSA advises FBO staff to wash their hands before touching or handling any food, especially ready-to-eat food and after touching raw meat, poultry, fish, eggs or unwashed vegetables. The guidance also states other scenarios when handwashing should be undertaken, for example after entering the kitchen, after breaks or going to the toilet and after touching or emptying bins.

The same guidance also highlights the following six steps for effective handwashing:

1. Wet your hands thoroughly under warm running water and squirt liquid soap onto your palm.
2. Rub your hands together palm to palm to make a lather.
3. Rub the palm of one hand along the back of the other and the fingers. Repeat with the other hand.
4. Put your palms together with fingers interlocked and rub in between each of the fingers thoroughly.
5. Rub around your thumbs on each hand and then rub the fingertips of each hand against your palms.

6. Rinse off the soap with clean water and dry your hands thoroughly on a disposable towel. Turn off the tap with the towel and then throw the towel away.

Kitchen Life 2: Findings for Households

This section of the report presents quantitative and qualitative findings from households during the KL2 study. Where “MFP” is referred to in quantitative findings from filming (where behaviours have been coded and counted, based on video footage) this includes both raw and cooked MFP, and this is stated clearly. Qualitative findings, based on reviewing individual sections of footage for behavioural analysis (such as case studies) and interviews are specific to raw MFP only, and “raw” is clearly stated. Findings from a survey conducted with households are also included.

Further information about the coding of raw and cooked MFP is available in the [KL2 technical report](#).

Quantitative observations from filming

In the sample of 70 households, all but one (69) prepared meat, fish or poultry on at least one meal occasion. Specifically, 308 meal occasions involved the preparation of MFP (accounting for 29% of all meal occasions).

When looking at the frequency of handwashing, of these 308 meal occasions involving the preparation of MFP ([footnote 11](#)):

- 39% (119) involved washing hands with soap. On average, handwashing with soap occurred twice per meal occasion and lasted for 16 seconds ([footnote 12](#)).
- 44% (136) involved washing hands without soap. On average, handwashing without soap occurred three times per meal occasion and lasted for 6 seconds.
- 26% (80) involved someone not washing their hands for at least 45 minutes during the meal occasion.

Touching other kitchen items when preparing raw MFP was commonly observed across all households, with the most common items or areas touched when prepping raw MFP being countertops, dishes, fridges, pots and pans, sinks and utensils.

Within the household sample, not washing hands with soap after touching MFP was statistically:

- more likely to occur on Sunday between 2-8 p.m., as MFP was more likely to be prepared and cooked on this day.
- positively correlated ([footnote 13](#)) with the behaviour ‘[Reusing a chopping board after preparing meat, fish and poultry](#)’ ($r = 0.489$) due to these behaviours occurring contemporaneously.

Factors influencing washing hands with soap after preparing raw MFP in households

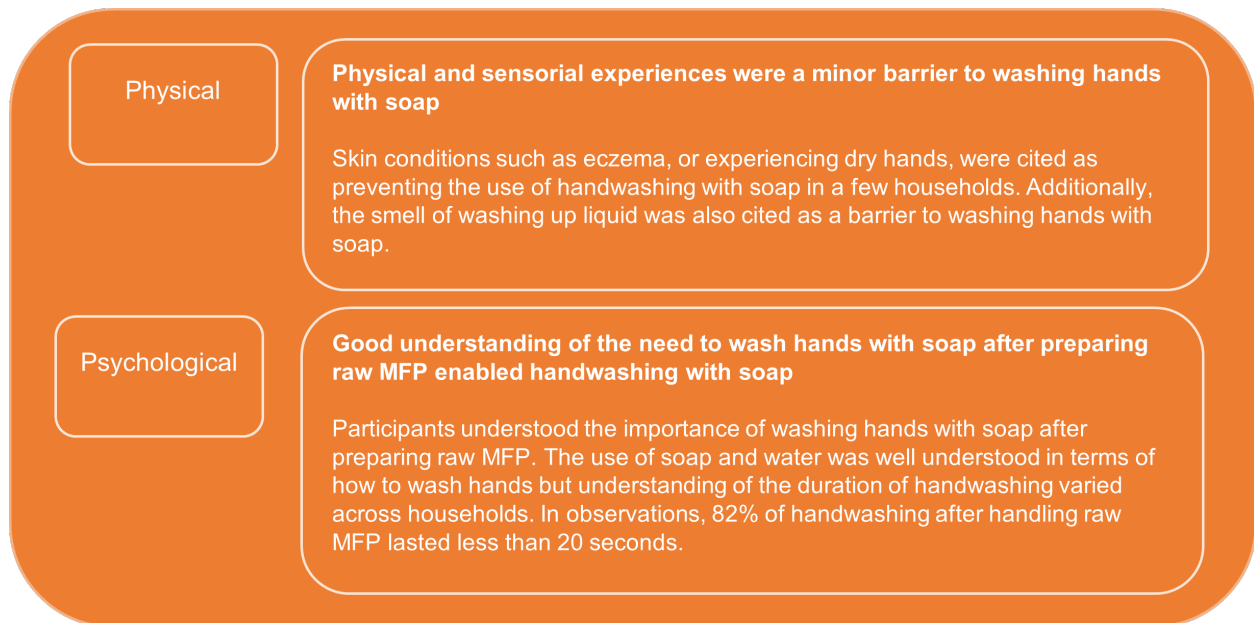
Summary

Overall, the barriers to washing hands with soap after touching raw MFP in households were mainly driven by motivational factors. Handwashing habits and emotionally driven cognitive effects, such as tiredness and distraction, were barriers to washing hands with soap. Barriers also included beliefs about the limited consequences arising from not washing hands with soap, together with beliefs about what constitutes effective handwashing behaviour. A summary of

COM-B factors is given in Figure 1:

Figure 1: Summary of COM-B factors influencing washing hands with soap after touching raw MFP in households

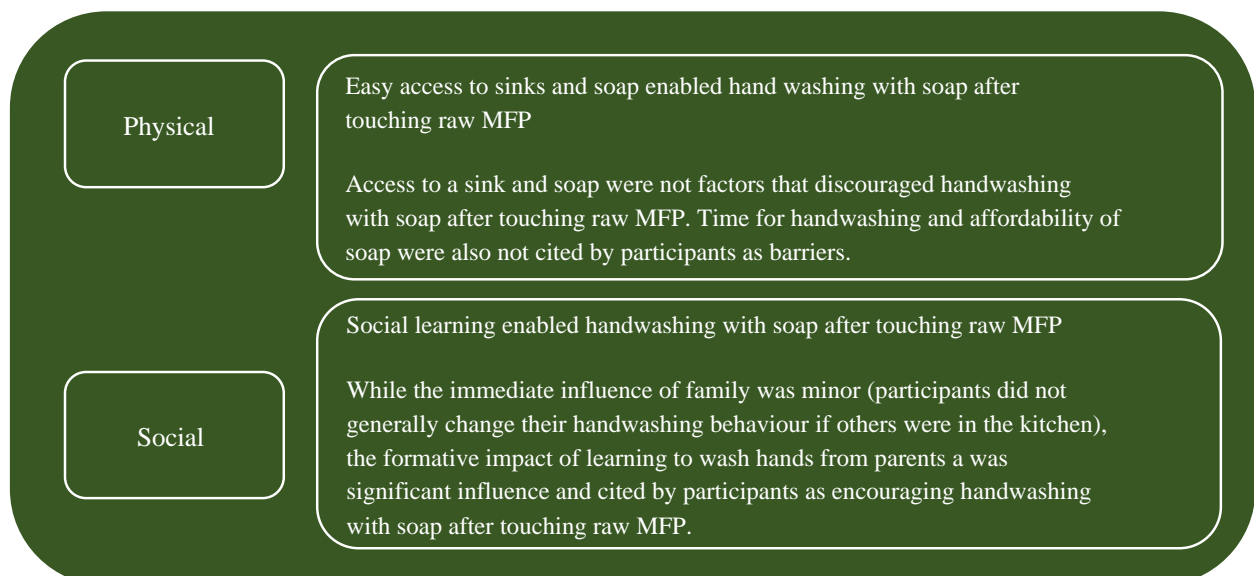
Capability



Physical: Physical and sensorial experiences were a minor barrier to washing hands with soap. Skin conditions such as eczema, or experiencing dry hands, were cited as preventing the use of handwashing with soap in a few households. Additionally, the smell of washing up liquid was also cited as a barrier to washing hands with soap.

Psychological: Good understanding of the need to wash hands with soap after preparing raw MFP-enabled handwashing with soap. Participants understood the importance of washing hands with soap after preparing raw MFP. The use of soap and water was well understood in terms of how to wash hands but understanding of the duration of handwashing varied across households. In observations, 82% of handwashing after handling raw MFP lasted less than 20 seconds.

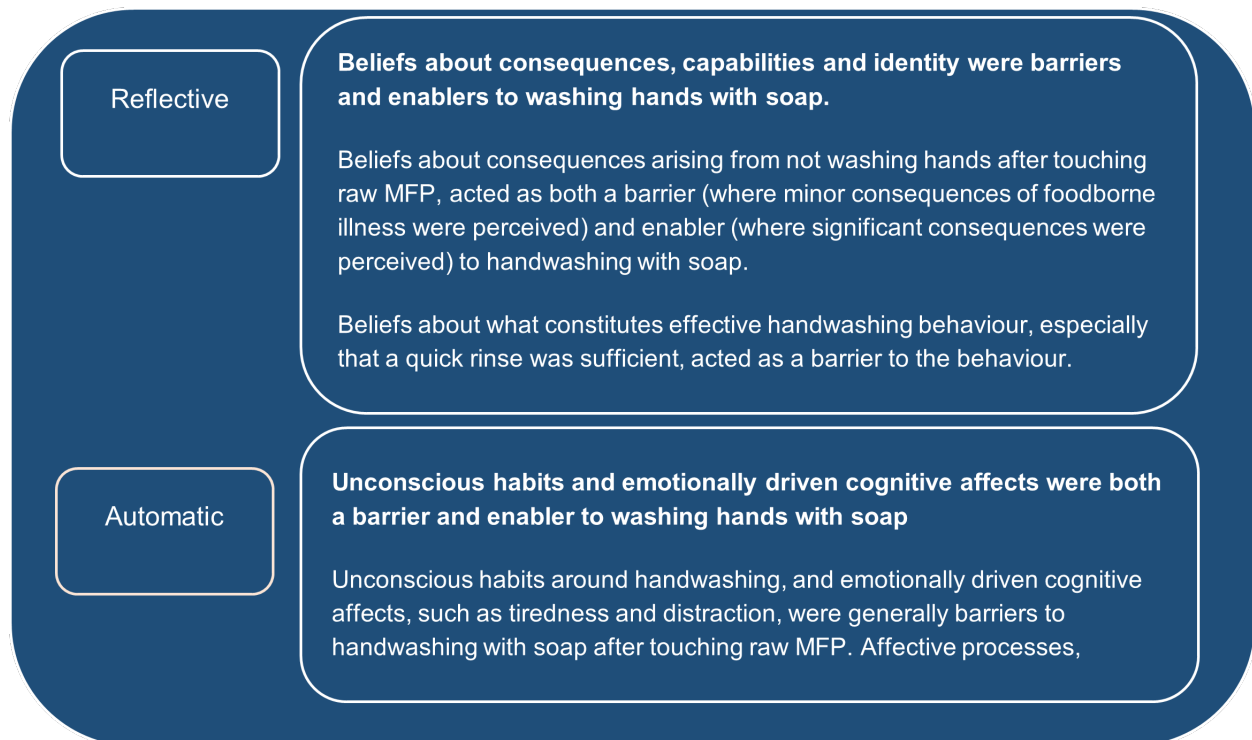
Opportunity



Physical: Easy access to sinks and soap enabled hand washing with soap after touching raw MFP. Access to a sink and soap were not factors that discouraged handwashing with soap after touching raw MFP. Time for handwashing and affordability of soap were also not cited by participants as barriers.

Social: Social learning enabled handwashing with soap after touching raw MFP. While the immediate influence of family was minor (participants did not generally change their handwashing behaviour if others were in the kitchen), the formative impact of learning to wash hands from parents was a significant influence and cited by participants as encouraging handwashing with soap after touching raw MFP.

Motivation



Reflective: Beliefs about consequences, capabilities and identity were barriers and enablers to washing hands with soap. Beliefs about consequences arising from not washing hands after touching raw MFP acted as both a barrier (where minor consequences of foodborne illness were perceived) and an enabler (where significant consequences were perceived) to handwashing with soap. Beliefs about what constitutes effective handwashing behaviour, especially that a quick rinse was sufficient, acted as a barrier to the behaviour. An individual's identity, such as being a good parent or having good personal hygiene standards, was an enabler of handwashing with soap.

Automatic: Unconscious habits and emotionally driven cognitive affects were both a barrier and an enabler to washing hands with soap. Unconscious habits around handwashing, and emotionally driven cognitive affects, such as tiredness and distraction, were generally barriers to handwashing with soap after touching raw MFP. Affective processes, prominently disgust, were an enabler of washing hands with soap after touching raw MFP.

Detailed findings

Physical Capability

Almost all participants in the study were physically capable of washing their hands with soap and water. In a small number of households, skin conditions such as eczema were cited as a barrier to washing with soap. Several participants also cited 'hands becoming dry' as a barrier to frequent washing with soap and water.

I tend to try and avoid using soaps and things if I can, as my hands get quite bad, or they did get quite bad as a youngster, so that does affect me a little bit...I do feel that if I were to wash my hands with soap scrupulously every time, it would not be good in the long term

Male, 41-60 years, White, socio-economic group ABC1, Lives alone

Other sensorial factors also acted as barriers. For example, several households only had washing up liquid by the kitchen sink and used this instead of soap to wash hands. Both the smell and strength of washing up liquid were cited as a barrier to use by certain participants.

I don't use a lot of soap [referring to washing-up liquid] because I don't want to get the smell on my hands, so I use some but only just enough. I sort of feel that if I can smell it, then it means there's soap still on it...

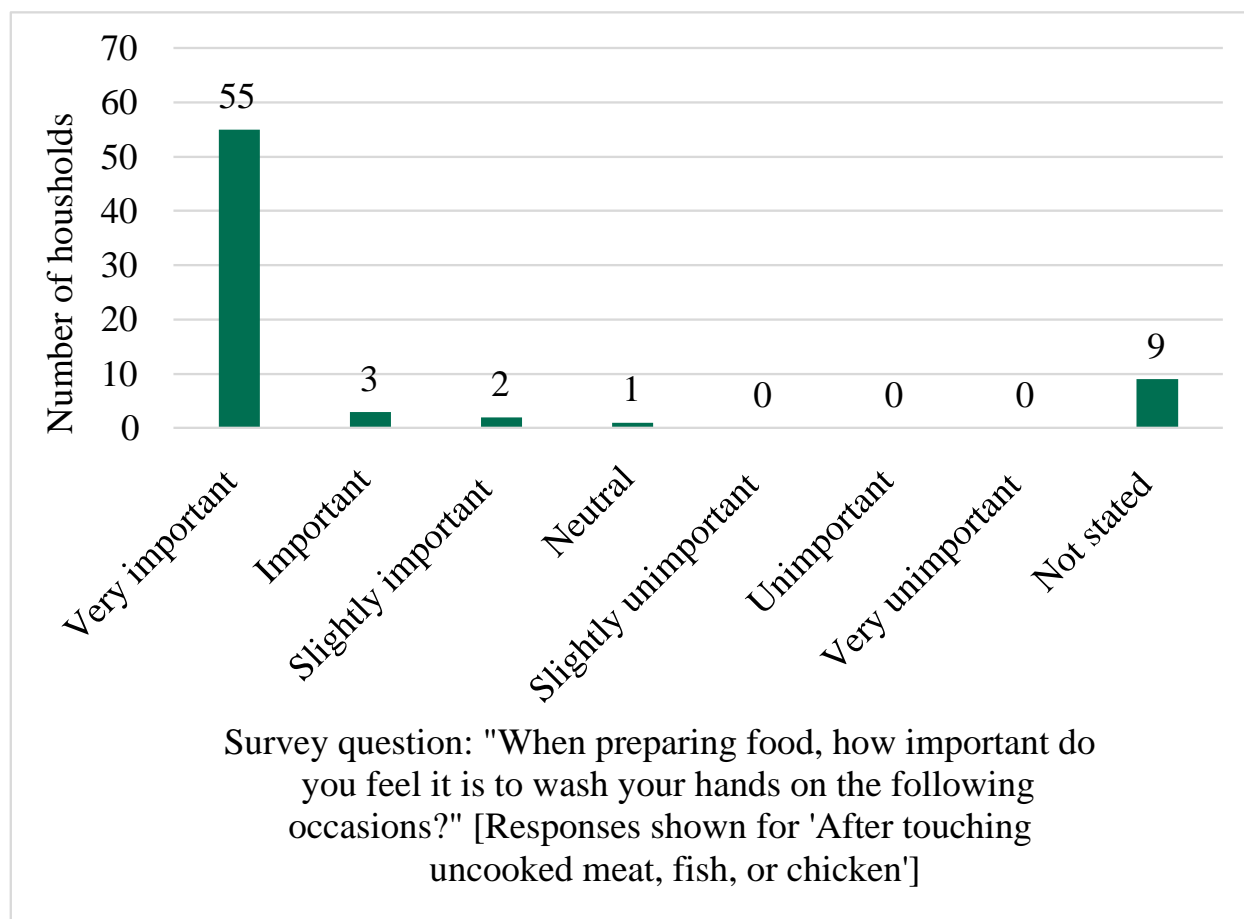
Female, 41-60 years, Black, socio-economic group ABC1, Lives with partner.

There were a few instances of participants using disposable gloves during the preparation of raw MFP. This was cited as being done for hygienic reasons with a view that 'gloves give you a good barrier' to prevent cross-contamination from raw MFP. [FSA FBO guidance \(footnote 14\)](#) states that disposable gloves should never be used as an alternative for effective handwashing, however, Kitchen Life 2 data was not analysed to determine if glove use was used as an alternative for handwashing.

Psychological capability

Households had a good knowledge of the need to wash hands with soap and water after touching raw MFP. From KL2 survey data, almost all participants who responded to the question said it was important to wash hands with soap and water after touching uncooked MFP (55 stated 'very important' and 3 stated 'important'), with none stating that it was unimportant (see figure 2).

Figure 2: Understanding of the importance of washing hands with soap after touching MFP in households (n=70).



In terms of how to wash hands, while the need to use soap and warm water was well understood, participants were unsure about the duration of handwashing ([footnote 15](#)). KL2 observations show that handwashing lasted for less than 20 seconds in 82% of handwashing with soap occasions after MFP (raw/cooked) was handled. The need to thoroughly dry hands after washing was not mentioned in interviews nor routinely observed.

Physical opportunity

Physical opportunity was generally not a barrier towards washing hands with soap after touching raw MFP. All households had easy access to a sink in the kitchen, which was near the area used for prepping raw MFP. Soap and (more commonly) washing up liquid were also present and situated next to the sink in kitchens, making it easy to use for handwashing. In certain households, the sink was occasionally crowded with other pots, pans and utensils which could constrain the space available to wash hands.

The time available to wash hands with soap after touching raw MFP, together with the affordability of soap or washing-up liquid, was not cited by participants as barriers to the behaviour overall. However, it was seen as relatively impractical to wash hands with soap every few seconds when preparing food.

Social opportunity

The influence of social opportunity was relatively limited. Handwashing was seen as 'common sense' and, in the interviews, participants noted that such behaviours were not a topic of general discussion.

Most raw MFP preparation was undertaken by someone alone in the kitchen, so there was limited scope for discussion of the need for handwashing with soap. During occasions when another

person was present in the kitchen, no comments were heard during filming about handwashing after preparing raw foods.

In the interviews, there were a small number of instances of individuals saying they were more likely to wash their hands with soap if others were present in the kitchen. However, it was not possible to verify this due to limited data for comparative purposes.

While the immediate influence of family was minor, the formative impact of learning to wash hands with soap from parents was more notable. Specifically, washing hands after touching raw MFP was seen as a behaviour learned and ingrained from childhood, with the role of parents routinely cited by participants in the interviews as influential.

I can always remember Mum drumming into us: always wash your hands after handling raw meat, especially chicken. That was drummed into us as kids.
Male, 41-60 years, White, socio-economic group C2DE, Lives alone

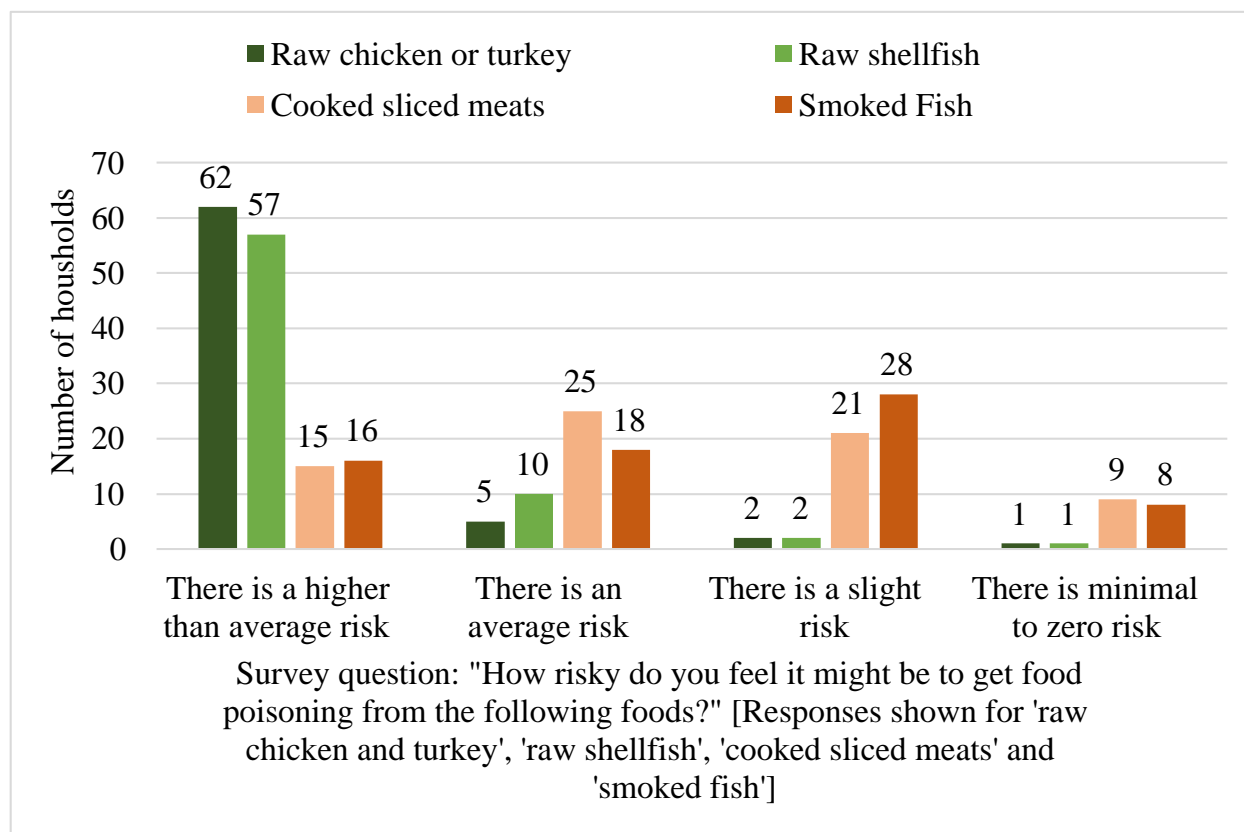
Reflective motivation

There were a variety of reflective motivation factors mentioned by participants in the study and these both positively and negatively influence washing hands with soap after touching raw MFP. Overall, reflective motivation concerned the following:

- beliefs about consequences and the risks of not washing hands with soap after touching raw MFP, for example, the risk of foodborne illness for self and others.
- beliefs about capabilities, and how to perform effective handwashing behaviours, for example, whether rinsing hands was sufficient to clean them to manage this risk.
- how an individual's identity influenced handwashing practices, for example, how being a good parent enabled the behaviour.

In terms of beliefs about the consequences, in the KL2 survey households generally identified a higher-than-average risk of food poisoning associated with handling raw MFP, compared to other foods. Raw chicken and turkey, as well as raw shellfish, were seen to have a comparatively high risk, compared to cooked sliced meats and smoked fish, for example, figure 3).

Figure 3: Understanding the relative risk of food poisoning from handling raw MFP from among households (base=70)



In interviews, raw chicken was especially cited by participants as a risk in terms of salmonella poisoning.

There's always a sort of an alert in your mind that, you know, a chicken is danger.
Female, 26-40 years, White, socio-economic group C2DE, Lives alone.

The risk of illness was mentioned as a key factor influencing the need to wash hands with soap after touching raw MFP. This was particularly the case for households with children, with the risks from food poisoning for young children seen as very serious.

I've got a two-year-old. I don't want to make them ill. If I touched a raw chicken fillet then I'm not gonna start walking around and touching everything in the kitchen... I don't even like touching the tap to wash my hands, because then I'm gonna have to clean the tap.
Female, 26-40 years, White, socio-economic group ABC1, Lives with family

Despite associating raw MFP as a high-risk food category, participants who did not wash their hands with soap after preparing raw MFP expressed a range of beliefs about the consequences of not doing so. These included:

- Some exposure to germs was needed to boost the immune system and living in an environment that is too sterile was 'not natural'.
- Participants had not fallen ill as a consequence of not washing their hands with soap after touching raw MFP.
- Risks from food poisoning were exaggerated.

If I'd had problems from being ill I'd probably be more conscious...I think, as I haven't got ill, I haven't changed my behaviour, so I haven't given much thought to it.
Male, 41-60 years, White, socio-economic group ABC1, Lives alone

If I got food poisoning, like, I know, it can be bad, but in the most terms, like you might be a little bit sick... But at the other end, you know, you're going to a few pounds lighter. Is it that bad?

Female, 26-40 years, White, socio-economic group ABC1, Lives with friends

In terms of beliefs about capabilities, there were different views concerning what constitutes effective handwashing after touching raw MFP. These influenced hand-washing practices adopted by participants. The following beliefs around handwashing were relatively common:

- rinsing hands was sufficient to remove any bacteria from touching raw foods.
- using hot water alone (rather than soap) would kill any germs on the hands.
- antibacterial wipes were a good substitute for washing hands with soap.
- undertaking other cleaning activities (for example, washing up, or cleaning a surface), would remove germs from hands.

If the hot water has been running and the hot water is quite hot, I will just use really hot water instead of soap

Female, 41-60 years, Black, socio-economic group ABC1, Lives with partner.

If I've washed up and there's still hot soapy water in there that's clean, I'll just put my hands in there [rather than wash with running water and hand soap].

Female, 26-40 years, White, socio-economic group ABC1, Lives with family.

Related, although less common, the length of time handling raw MFP was also cited by participants as a factor in whether they washed their hands with soap. Specifically, for certain participants, only briefly touching meat meant the risk of cross-contamination was perceived to be low.

It depends how quickly it goes in the pan. It's like the 5-second rule of picking something up off the floor

Male, 26-40 years, White, socio-economic group ABC1, Lives alone.

Identity also played a notable role in influencing handwashing behaviours. Several participants noted that they like the kitchen to be clean and tidy, with good personal hygiene (notably handwashing) seen as fundamental to their sense of identity. Hygiene was also strongly linked to ideas of being a 'good parent', and more broadly linked to health, beauty/aesthetics, caring, and creating a good home.

It is very important for my husband and for my kids learning. They will see my kitchen is clean. When they will be grown up, it means they will copy me.

Female, 26-40 years, Asian, socio-economic group ABC1, Lives with family

Automatic motivation

There were three main automatic processes influencing the behaviour: unconscious habits, sensorially driven affective processes concerning disgust, and emotionally driven cognitive affects, such as tiredness and distraction.

In terms of unconscious habits, when preparing raw MFP, generally participants either routinely washed their hands with soap, rinsed their hands, or did not wash their hands at all. In interviews, many participants spoke of performing such behaviours automatically – as once handwashing routines were established, they were done 'without thinking', and cued by the context of the behaviour (for example, after handling raw MFP). Conversely, a lack of an established routine could also inhibit handwashing with soap after touching raw MFP.

Funny all these things you just do automatically, you don't think about it. There's plenty of germs and things here and it's always a good idea to wash your hands

before preparing food I suppose

Female, 60+ years, White, socio-economic group C2DE, Lives with partner

Do I always use soap... Probably not. No... so to be honest, I don't think I'm really that conscious of washing my hands

Male, 26-40 years, Black, socio-economic group C2DE, Lives alone

One of the main enablers of handwashing behaviour when preparing raw MFP was sensorial-driven affective processes. Raw MFP was described as 'cold' and 'slimy' to touch, 'bloody' in appearance and with a distinctive smell. This triggered disgust amongst many participants, with hand-feel especially potent.

I hate handling chicken, I can't stand it, it's slimy...I'm aware when I'm handling chicken of what I've touched, what needs to be washed...I try to get all the chicken-y bits done ASAP so as not to cross-contaminate

Male, 41-60 years, White, socio-economic group ABC1, Lives alone.

Participants were also observed to wash their hands with soap less often after touching frozen raw MFP compared to fresh raw meat. In interviews, this was because frozen meat was described to be 'cold' rather than 'slimy'.

While not common, a few participants were particularly concerned about touching raw MFP (occasionally describing the behaviour as 'phobic') and adopted a range of strategies to avoid this. These included using disposable gloves or cutting raw MFP in the packaging or directly in the pan to avoid hand contact.

In a few instances, disgust concerning sink hygiene was also mentioned by participants as a barrier towards handwashing (this point was made in general rather than in the context of raw MFP). For example, a very dirty and untidy sink in a shared student house was described as off-putting and therefore participants were less likely to go to the sink to wash their hands.

Dishes get left by the sink and not taken care of. There is very little space by the sink. It's dirty. No one wants to go over there

Female, under 25 years, White, socio-economic group C2DE, Lives with friends

Emotionally driven cognitive affects, such as tiredness and distraction, were observed and mentioned as drivers of touching other kitchen items after touching raw MFP. For example, these included:

- Being busy and multi-tasking, resulting in touching another utensil or object during food preparation
- Being distracted. This was most notable for households with young children but could also occur during conversations with adults in the kitchen.
- Tiredness and the behaviour being done absentmindedly.

Yeah. I do get distracted with the kids sometimes, yeah. I try to be more strict with the meat. But sometimes I do forget.

Female, 26-40 years, White, socio-economic group ABC1, Lives with family, including children

Touching other items in the kitchen after handling raw MFP was extremely common. Overall, participants had limited awareness of the extent to which they touched other items whilst preparing raw MFP. It was common for people to claim to be 'really strict on handwashing' and yet to be observed touching utensils and pans, without washing their hands with soap.

For those with greater awareness of the behaviour, there was an impracticality associated with being able to wash hands with soap immediately after prepping raw MFP – with simple tasks such

as turning on the tap and dispensing soap very challenging to do without touching the items ([footnote 16](#)).

Case Study

Washing hands with soap after preparing raw MFP in households

Name: Sarah

Age group: 26-40

Household composition: Lives with family, including children

Age of child: 11

Sarah lives in a semi-rural village with her partner Ian and her 11-year-old daughter. Sarah's job involves very long hours, including night and day shifts, and she often feels exhausted from work. Sarah has a strong sense of family values – 'family always comes first, and I try to do as much as possible for them'.

Sarah has a small square kitchen with a cooker, sink and slim dishwasher (which is rarely used). While the kitchen worktops are relatively uncluttered, crockery, utensils, and chopping boards are often left in the sink. Sarah tries to keep on top of kitchen chores, but her job and tiredness make it hard: 'If I'm really busy I tend to let things slide'. Overall, she wants her house to feel 'homely, relaxed, and comfortable' and Sarah believes 'having a bit of mess in the kitchen is fine.'

Sarah enjoys cooking and has a good understanding of food risks, as she used to work in catering and has undertaken level 2 food hygiene training. She knows touching raw meat is a risk during food preparation and, during her interview, notes the importance of washing the front and back of her hands with soap for at least 20 seconds. Despite this knowledge, Sarah describes her approach to risk as 'more relaxed' and describes food hygiene as being 'not massively important to me... I like to make sure surfaces are clean, and I wash my hands out of habit, yeah, but other things I don't really think of'.

On one occasion, she is cooking a chicken stir fry from scratch. Sarah does not wash her hands when she comes into the kitchen (in the interview she claims she has done this in another room, however, this can't be confirmed). She is on her mobile phone a lot prior to cooking but does not use it during the food preparation process. She cuts some vegetables and puts them in the pan to fry and then uses the same knife and board to chop the raw chicken breast. She seems tired and absent-minded during preparation. She then uses the same hand that has handled the raw chicken to touch the frying pan, open a fridge door, and hold a different knife handle. None of these surfaces are wiped. She then washes her hands for 7 seconds with washing up liquid and hot water. Washing comprises of a light rinse rather than a thorough clean. Sarah then shakes her hands dry, before placing the raw chopped chicken back into the fridge and continuing to cook the meal. Sarah does not directly touch the raw chicken when placing it into the fridge, but she handles the edges of the chopping board where the raw chicken has been prepared. Sarah does not wash her hands after putting the chicken into the fridge.

Analysis of Sarah's behaviour

The influences on Sarah's behaviour mainly relate to automatic motivation, which acts as a barrier to handwashing with soap after touching raw MFP, plus psychological capability which enabled the behaviour. Sarah understands the importance of handwashing to manage the risks of foodborne illness and gave a textbook answer on how to wash hands with soap during the interviews (front, back, soap, duration). Her knowledge enabled her to wash her hands with soap after touching raw MFP (psychological capability), and while this is observed, other factors influence the behaviour.

Specifically, according to her interview, Sarah believes that her handwashing practices after preparing raw MFP are habitual (automatic motivation). Her habits involve a mixture of handwashing with soap and rinsing hands. Sarah was very tired when cooking the meal, which was prepared late at night. Sarah absentmindedly touches a variety of kitchen items before washing her hands with soap. This combination of factors - tiredness and habits - acts as a barrier to washing hands with soap after each occasion when raw MFP is touched (automatic motivation).

Identifying behaviours for interventions (Households)

In reviewing the KL2 findings, a notable influence on washing hands with soap after touching raw MFP in households was the habitual nature of the behaviour. While no household always adopted the behaviour, generally households fell into one of three groups: those less likely to wash their hands, those who rinsed their hands with water and those who washed their hands with soap. Additionally, preparing raw MFP involved multi-tasking, often when participants were distracted, and other objects in the kitchen were routinely touched after handling raw MFP.

After KL2 fieldwork was completed, a workshop was held with experts in food hygiene and the behavioural sciences to discuss the COM-B influences on each of the KL2 priority behaviours, including not washing hands after touching raw MFP. In the workshop, experts discussed the findings from KL2 to explore the 'problem behaviours' that occurred in kitchens and then considered the 'desired practice'; that is, the behaviour that households and FBOs should do to improve food safety. In this case, the desired practice is for individuals in households to **thoroughly wash their hands with soap after preparing raw MFP**.

Once the 'desired practice' was established, the workshop then explored the specific behaviours to target, to encourage the desired practice. It should be noted that the workshop was not designed to explore behavioural interventions, as this was outside of the scope of KL2. These specific target behaviours could be used in future research, for the development of behavioural interventions.

A specific behaviour identified was **to prepare all raw MFP together, as a single task**. Findings from the KL2 study indicate that all households have soap or washing up liquid and hot water available in kitchens. They also knew how to wash their hands with soap and that it was especially important to do so after touching raw MFP. Consequently, physical opportunity and capability factors were not major barriers to the desired behaviour.

Rather, barriers were related to multitasking, with raw food touched on several occasions in between handling other kitchen items. This in turn led to a quick rinsing of hands, which was commonly observed during raw MFP preparation and participants felt it impractical to wash hands thoroughly with soap each time raw food was touched. Consequently, preparing raw MFP as a single task, and washing hands with soap immediately afterwards would be key to achieving the desired practice.

Specifically, behavioural intervention designs should consider the factors outlined, including affective processes (such as disgust), personal identity (personal hygiene/being a good parent) and practicality (the need to only do it once, rather than multiple times). Reflective motivation, especially planning around how the meal is prepared, is an important enabler of the behaviour.

Kitchen Life 2: Findings for FBOs

This section of the report presents quantitative and qualitative findings from filming in FBOs during the KL2 study. Where "MFP" is referred to in quantitative findings from filming (where behaviours have been coded and counted, based on video footage) this includes both raw and cooked MFP, and this is stated clearly. Qualitative findings, based on reviewing individual

sections of footage for behavioural analysis (such as case studies) and interviews are specific to raw MFP only, and “raw” is clearly stated. Findings from a survey conducted with FBOs are also included.

Further information about the coding of raw and cooked MFP is available in the [KL2 technical report](#).

Quantitative observations from filming

In the sample of 31 FBOs, 29 prepared meat, fish or poultry (raw/cooked) on at least one meal occasion. Specifically, there were 180 meal occasions that were associated with raw/cooked MFP (accounting for 58% of all meal occasions).

When looking at the frequency of handwashing, of these 180 meal occasions where MFP (raw/cooked) was handled:

- 37% (66) involved staff washing hands with soap. On average, this occurred just over three times per meal occasion and lasted for 11 seconds ([footnote 17](#)).
- 39% (70) involved staff washing hands without soap. On average, this occurred three times per meal occasion and lasted for 6 seconds.
- 25% (45) involved staff not washing hands for at least 45 minutes during the meal occasion.
- 14% (26) involved staff wearing disposable plastic gloves. Blue gloves were available in 3 FBOs (1 in 10).

Touching other kitchen items when preparing raw MFP was commonly observed across all FBOs, with the most common items or areas touched when prepping raw MFP being countertops, pots and pans, dishes, utensils and fridges.

Within the FBO sample, not washing hands with soap after touching MFP (raw/cooked) was statistically:

- more likely to occur on Friday, between 12-2 pm and after 6 pm, which was the peak service hours for FBOs.
- positively correlated with the behaviour ‘[Reusing a chopping board after preparing meat, fish and poultry](#)’ ($r = 0.628$) due to these behaviours occurring contemporaneously.

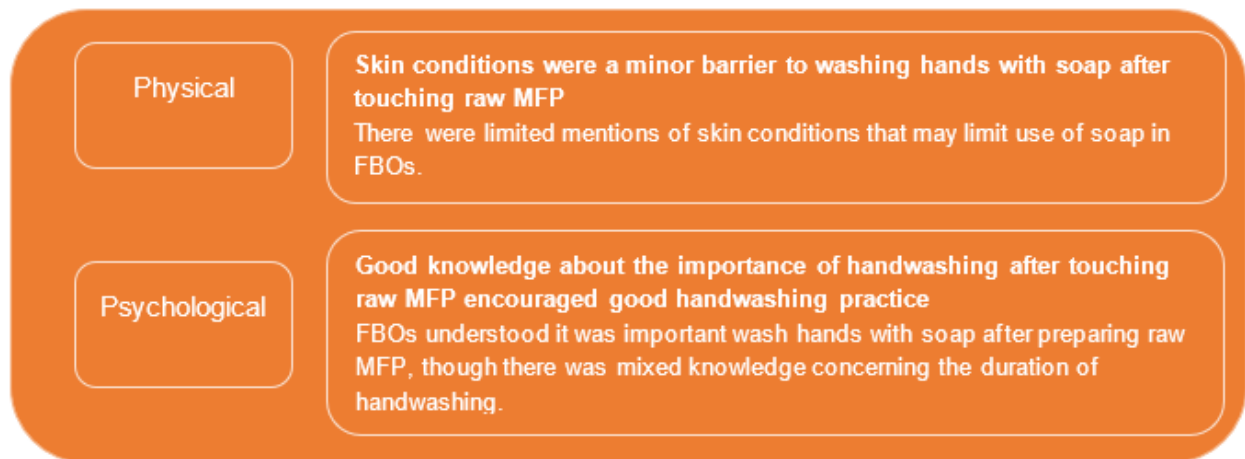
Factors influencing washing hands with soap after preparing raw MFP in FBOs

Summary

Overall, in FBOs, washing hands with soap after touching raw MFP was influenced by the layout of the kitchen and access to a sink, with barriers including the busyness of FBOs, and the time taken to wash hands with soap. Social norms and accompanying routines could be a barrier or an enabler to washing hands with soap; as in some FBOs, good handwashing practices were normalised and routine, whilst in other FBOs there was consistently a lack of good handwashing practice regardless of the food being prepared. Perceived risk to customers and reputational damage to the business encouraged good handwashing practices. However, the management in FBOs often assumed that experienced staff would wash their hands with soap, and assumed a clean kitchen meant that handwashing practices were being adhered to, although this was not always the case. Other important barriers to washing hands with soap include unconscious habits around wiping hands on a tea towel rather than handwashing. A summary of COM-B factors is given in figure 4.

Figure 4: Summary of COM-B factors influencing not washing hands with soap after touching raw MFP in FBOs

Capability



Physical: Skin conditions were a minor barrier to washing hands with soap after touching raw MFP. There were limited mentions of skin conditions that may limit the use of soap in FBOs.

Psychological: Good knowledge about the importance of handwashing after touching raw MFP encouraged good handwashing practice. FBOs understood it was important to wash hands with soap after preparing raw MFP, though there was mixed knowledge concerning the duration of handwashing.

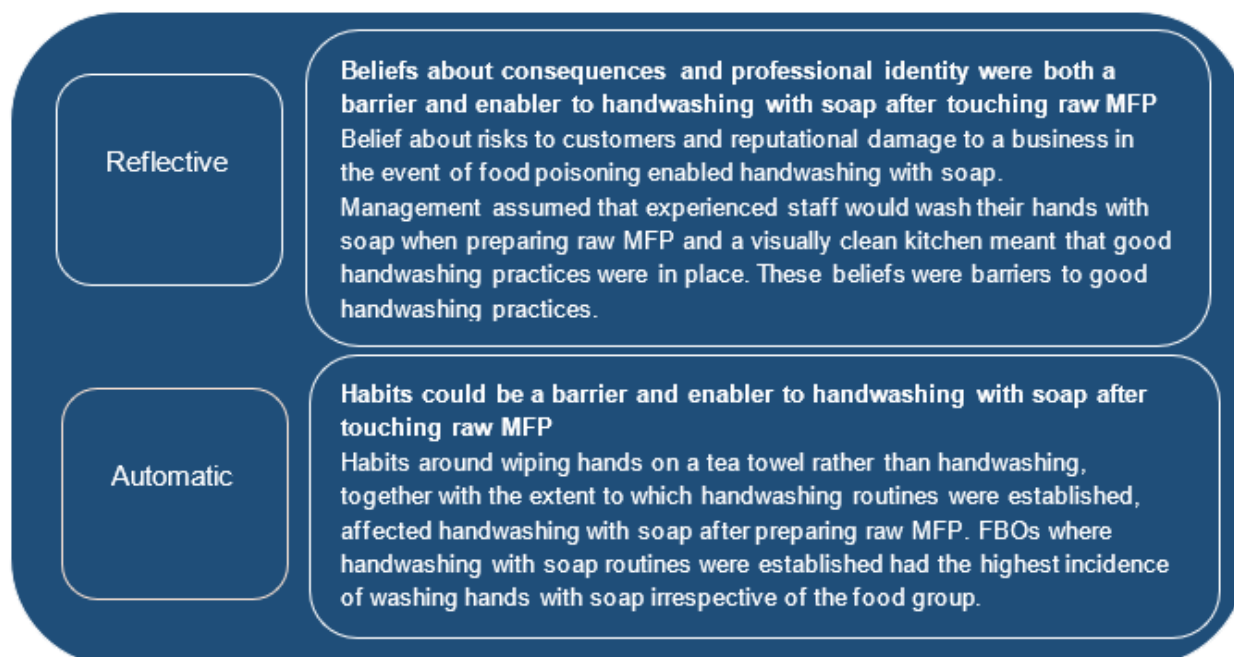
Opportunity



Physical: The size and layout of the kitchen were barriers and enablers of handwashing after touching raw MFP. Distance to the kitchen sink, together with the busyness during peak service hours, were barriers to washing hands with soap when preparing raw MFP.

Social: Social norms acted as a barrier and enabler of washing hands with soap after touching raw MFP. Although handwashing was not openly discussed in kitchens amongst staff, FBOs often had a culture of either handwashing regularly or not handwashing regularly. Therefore social norms were either a key barrier or enabler of the behaviour.

Motivation



Reflective: Beliefs about consequences and professional identity were both a barrier and enabler to handwashing with soap after touching raw MFP. Belief about risks to customers and reputational damage to a business in the event of food poisoning enabled handwashing with soap. Management assumed that experienced staff would wash their hands with soap when preparing raw MFP and a visually clean kitchen meant that good handwashing practices were in place. These beliefs were barriers to good handwashing practices.

Automatic: Habits could be a barrier and enabler to handwashing with soap after touching raw MFP. Habits around wiping hands on a tea towel rather than handwashing, together with the extent to which handwashing routines were established, affected handwashing with soap after preparing raw MFP. FBOs where handwashing with soap routines were established had the highest incidence of washing hands with soap irrespective of the food group.

Detailed findings

Physical capability

Most FBO staff in the study were physically capable of washing their hands with soap and water, and there was very limited mention of skin conditions or other factors that may limit the use of soap.

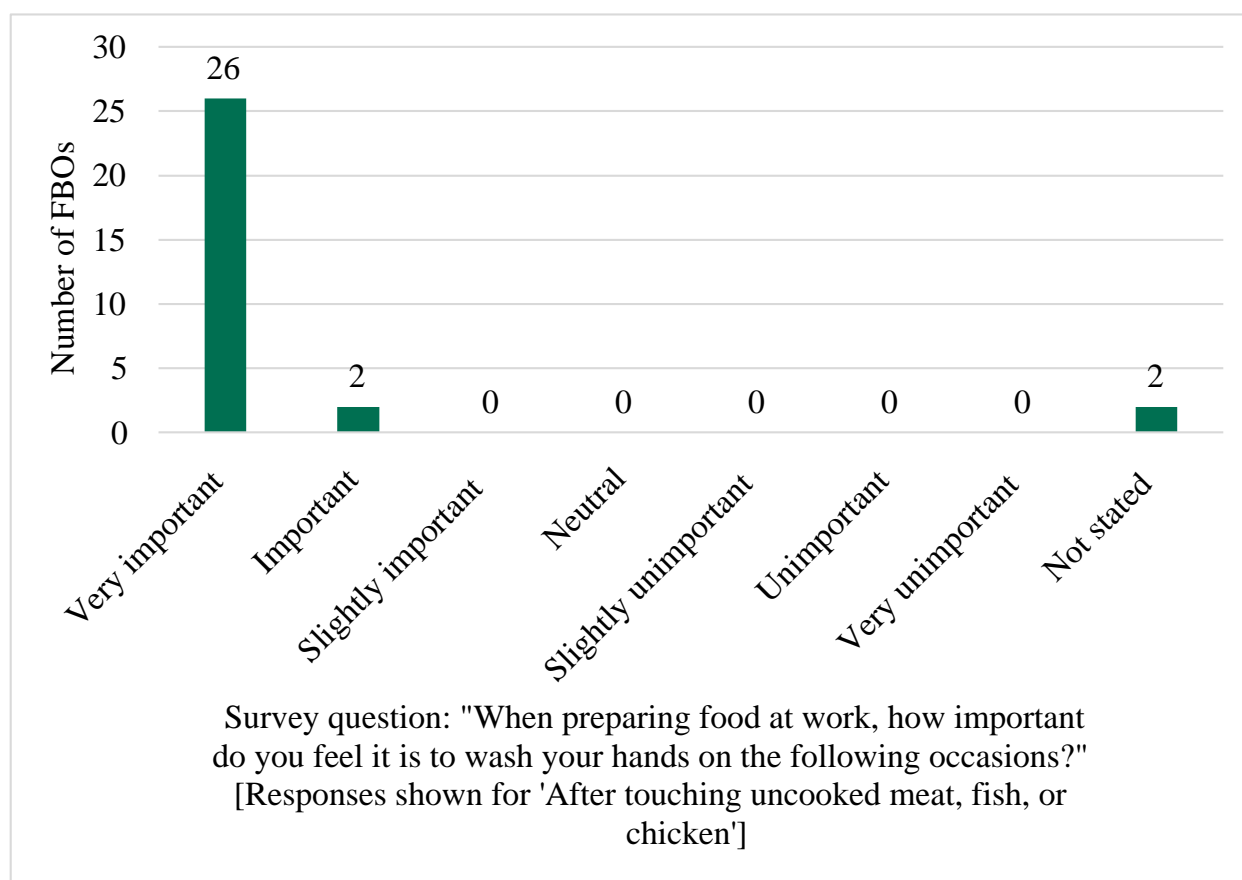
In the 3 FBOs where blue gloves were available (see physical opportunity), their use was due to personal preferences (often to avoid the hand feel of raw meat), rather than for hand protection purposes. The KL2 study did not focus on the use of gloves as an alternative handwashing, although [FSA guidance](#) states that gloves should never be used as an alternative to effective handwashing.

Psychological capability

Overall, there was a good understanding of the need to wash hands with soap when preparing raw MFP suggesting psychological capability enabled good handwashing practices in FBOs. In the survey, all FBOs that responded to the question (28) said it was either very important or important to wash their hands with soap after touching uncooked meat, fish, or chicken (see

figure 5).

Figure 5: Understanding the importance of washing hands with soap after touching raw MFP in FBOs (n=30)
[\(footnote 18\)](#)



In interviews, washing hands with soap after handling raw meat and fish was such a basic and fundamental food hygiene behaviour that staff knowledge was unquestioned by management in most businesses. This is further explored in the reflective motivation section.

I think the issue is that once they've done their level two [food hygiene certificate] we think, ok that's sorted, we don't need to think about it.
Italian restaurant, 5-10 staff, FHRS rating 4-5

While the need to use soap was well understood by FBO staff, the duration was less clear, though in interviews most guessed it to be around 30 seconds.

How long should it be for a thorough hand wash? I'm not sure. About 20-30 seconds I guess.
Pizza restaurant, more than 50 staff (multiple sites), FHRS rating 4-5

No FBOs mentioned FSA guidance in the [Safer Food, Better Business caterer pack \(footnote 19\)](#) when discussing good handwashing practice.

Physical opportunity

All food business kitchens in the sample had sinks and the vast majority (all but two) had a sink dedicated to handwashing, although handwashing did not always take place in the designated sinks. All sinks had soap or handwash nearby, often provided in a wall-mounted push-button dispenser. In this context, physical opportunity enabled handwashing (including handwashing after handling raw MFP).

However, FBO kitchens also varied significantly in size, layout and how the kitchen was organised. These factors created both opportunities and barriers to facilitate handwashing with soap.

In terms of kitchen size, in larger kitchens, it was typical for more than one sink to be present, although the distance from staff to a sink could prevent frequent handwashing. Distance from the sink was generally not a factor in small kitchens.

The layout was also influential in kitchens and was related to size. For example, in small kitchens, tables could block the most direct path to a sink. In larger kitchens, the shape of the kitchen could act as a barrier to sink access. For example, a pizza restaurant with a long, galley kitchen meant co-workers could block access to the sink, which could act as a barrier to accessing the skin and washing hands.

How space was used was also influential. For larger kitchens, it was typical to have different preparation areas for raw and cooked food. Smaller kitchens often used the same area for preparing raw and cooked foods, but separated these tasks in time – for example, chopping vegetables at first and then meat afterwards. Businesses with raw MFP preparation areas close to the sink enabled handwashing.

In interviews, a barrier to handwashing with soap when preparing raw MFP concerned staff being busy. Specifically, it was challenging for staff to find the time to walk over to the sink to wash their hands with soap when the FBO was very busy. During these busy occasions, instead of handwashing, tea towels were often observed to be used for wiping hands for convenience (see Chapter '[Reusing a tea towel or cloth for multiple purposes](#)'). Overall, not washing hands with soap after touching MFP (raw/cooked) was statistically more likely to occur on Friday (at lunchtime and after 6pm); peak service hours for most restaurants.

When we're really busy, it's a struggle to get that time just nip across, wash your hands and come back.

Mexican takeaway, less than 5 staff, FHRS rating 4-5

Disposable blue gloves were available in 1 in 10 FBOs in the study and were used on 14% of occasions where MFP (raw/cooked) was prepared. The factors influencing the use of blue gloves use were not explored in the study.

Social opportunity

Social norms in FBOs appeared to influence handwashing with soap after prepping raw MFP and could act as a barrier or enabler to good handwashing practices depending on the prevailing norm. The frequency of handwashing with soap after preparing raw MFP was seen to be greater in certain FBOs than others. Where handwashing with soap was observed, it did not appear to be driven by the presence of certain individuals (for example, the manager), rather it was the normal and dominant practice for the FBO, suggesting social norms were an enabler of handwashing behaviour. Similarly, for FBOs that infrequently washed their hands with soap after preparing raw MFP, a lack of handwashing was observed across a range of staff and included when staff were alone or someone else was in the kitchen, suggesting the influence of social norms as a barrier to handwashing after touching raw MFP.

In observations, there were no instances where handwashing practice was discussed. Rather, unspoken rules guided staff around food safety and chef participants commonly described an 'instinctive knowledge' of whether good practices were adopted by other staff in their kitchen.

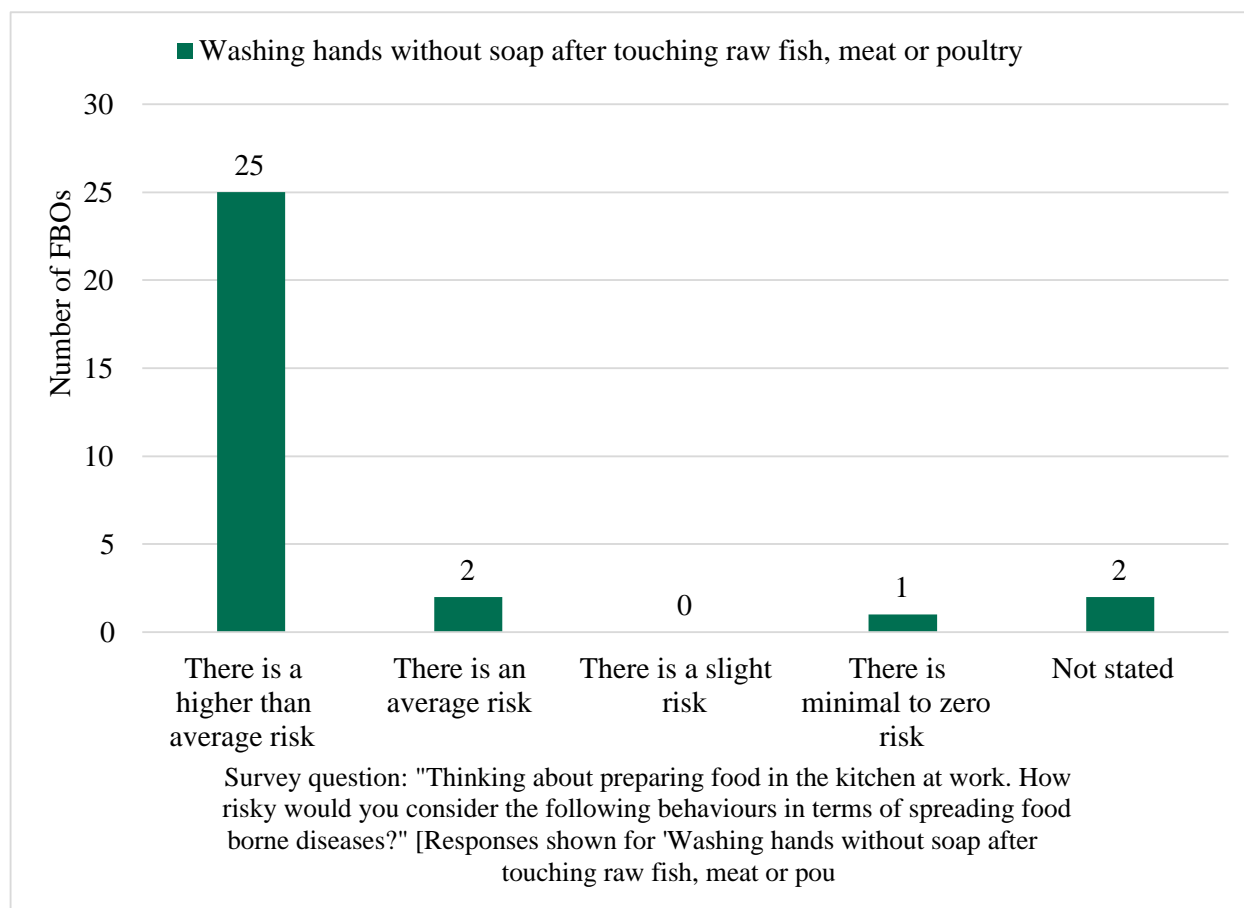
I guess it's all in my head, as I've never had to vocalise or tell anyone. I just know what's going on. It's sort of like a chef's instinct

Catering business, less than 5 staff, FHRS rating 0-3

Reflective motivation

Beliefs about the consequences of not washing hands with soap after preparing raw MFP generally enabled the behaviour. Overall, in the survey, most FBO participants (25) stated there was a higher-than-average risk associated with not washing hands after preparing raw MFP. Only 2 reported that there is an 'average risk' and only 1 reported there is 'minimal to no risk' (see figure 6).

Figure 6: Relative risks of foodborne disease associated with not washing hands with soap after preparing raw MFP (n=30) (footnote 20)



In the interviews, beliefs about the consequences of not washing hands after touching raw MFP were framed in terms of giving customers food poisoning, and the related impact on the business's reputation, both positively influencing good handwashing practice in FBOs.

Professional identity was also important in influencing beliefs about whether good handwashing with soap was adopted. On the one hand, being compliant with basic food safety requirements was seen as part of running a 'professional kitchen', which enabled washing hands with soap.

On the other hand, the behaviour was so basic that management assumed, rather than checked, how and whether effective handwashing behaviours were practised after preparing raw MFP. Specifically, managers trusted their staff to do this as they were experienced professionals.

I expect people to wash hands regularly. They are very experienced. But I don't police
Fish and chip shop, 5-10 staff, FHRS rating 4-5

Additionally, how the kitchen looked was also used by managers as a proxy for the behaviour. If the kitchen looked clean, managers believed that staff would wash their hands with soap after

preparing raw MFP. This belief that FBO staff always did the right thing because they were professional, reinforced by visual cues on cleanliness, was very common and had the potential to act as a barrier to handwashing with soap.

It's a very clean kitchen. You got good protocols in there. It's very obvious. There are very set ways of doing things.

Italian restaurant, 5-10 staff, FHRS rating 4-5

Finally, COVID-19 was cited in several food businesses as making staff more aware of the need to wash hands with soap, and certain businesses had also installed hand sanitisers in the kitchen as a consequence ([footnote 21](#)).

Automatic motivation

Habits were a factor which could prevent handwashing when preparing raw MFP. Specifically, many FBOs were observed to wipe their hands on a tea towel rather than washing their hands with soap when preparing raw MFP. This behaviour is discussed in depth in the chapter '[Reusing a tea towel or cloth for multiple purposes](#)'.

More generally, routines around handwashing when preparing raw MFP appear to be part of established handwashing practices in a kitchen. For example, FBOs who were observed to wash their hands with soap (after handling raw MFP) also had the highest incidence of washing their hands with soap irrespective of the food group. Similar patterns were observed for FBOs that did not wash their hands.

The 'hand-feel' of raw MFP, together with the smell, was also mentioned in interviews as a prompt to wash hands with soap (though this was less common than in households). It was also cited as a reason to use gloves in certain FBOs ([footnote 22](#)).

Case Study

Washing hands with soap after preparing raw MFP in FBOs

Name: John

Role: Manager

Type of business: Takeaway fish and chip shop

Number of staff: 5-10 staff

FHRS rating: 4-5

John owns a fish and chip shop. It is a small family business, and John runs it with his two sisters who work there full-time. Several nieces and nephews also work there on a part-time basis. They cook a variety of dishes, which includes preparing raw meats as well as fish. The kitchen is tidy, and the culture is described as 'quite laid back'. Even during busy periods, they try not to rush things.

The kitchen is compact and square in shape. The team try to prepare most of their food in advance of the rush hour and have divided the kitchens into different stations for food preparation (including an area for raw foods), cooking and serving. A separate sink is specifically provided for washing hands, and there is a liquid soap dispenser on top of this.

John is knowledgeable about food hygiene and believes they adopt good practices in the kitchen. He is especially concerned about using separate chopping boards for raw meats and fish. John is also mindful of preventing allergen cross-contact and has separate appliances for gluten-free cooking.

In the interview, John says that 'handwashing is encouraged' throughout the meal preparation process and claims hands were washed 'most of the time'. He does not explicitly mention handwashing with soap during the interview.

During one occasion, John is preparing raw chicken in the kitchen. He chops it on a red coloured board and uses his left hand to place the sliced chicken into a plastic container. During the preparation process, two other people come in and out of the kitchen, but most of the time, John works alone. The entire preparation takes about 5 minutes, during which time John does nothing else.

Post chopping, John walks across the kitchen and takes a bucket out of the sink and places the chopping board in the sink. This is all done with his right hand (which was used to hold a knife but not touch the raw chicken).

Only after this does John wash his hands. He does this in the main sink (rather than the handwash basin) and uses a shower hose to rinse his left hand only. He predominantly focuses on rinsing his fingers. Soap is not used, and handwashing lasts for 15 seconds. A colleague comes in to talk to John during this time. He then proceeds to thoroughly clean the chopping board with detergent.

Analysis of John's behaviour

The influences on John's behaviour mainly relate to psychological capability, reflective and automatic motivation, as well as physical opportunity factors. During the interviews, John is knowledgeable about the food hygiene risks from raw foods and also the need for handwashing when preparing such foods, though he does not mention using soap as part of this (psychological capability). John's knowledge and beliefs enable hand washing, but a lack of focus on the use of soap is a potential barrier to its use (reflective motivation). While John could reach the sink and soap, a bucket in the main sink prevented physical access, and John was distracted by a colleague when washing his hands. This lack of access and being distracted both act as barriers to handwashing with soap (physical opportunity and automatic motivation). Analysis of the footage suggests that John does not use the designated handwashing sink as using the main sink provides ease and convenience for multiple tasks. Footage indicates that using the main sink has become habitual for John, although this is only speculative as John did not discuss the use of the different sinks during the interview (automatic motivation).

'Identifying' behaviours for interventions (FBOs)

In reviewing the KL2 findings, a notable influence on washing hands with soap after touching raw MFP in FBOs was the habitual and distracted nature of the behaviour. Related to this, wiping hands on a tea towel rather than washing them could occur, especially when FBOs were busy.

While no FBO always did or did not wash their hands with soap when preparing raw MFP, generally FBOs fell into one of three groups: those who predominantly did not wash their hands, those who rinsed hands with water and those who washed their hands with soap. Additionally, when participants were busy or distracted, other objects in the kitchen were routinely touched after handling raw MFP.

After KL2 fieldwork was completed, a workshop was held with experts in food hygiene and the behavioural sciences to discuss the COM-B influences on each of the KL2 priority behaviours, including not washing hands after touching raw MFP. In the workshop, experts discussed the findings from KL2 to explore the 'problem behaviours' that occurred in kitchens and then considered the 'desired practice'; that is, the behaviour that households and FBOs should do to improve food safety. In this case, the desired practice is for individuals in households to **thoroughly wash their hands with soap after preparing raw MFP.**

Once the 'desired practice' was established, the workshop then explored the specific behaviours to target, to encourage the desired practice. It should be noted that the workshop was not designed to explore behavioural interventions, as this was outside of the scope of KL2. These specific target behaviours could be used in future research, for the development of behavioural interventions.

The other specific behaviour identified was **to stop staff wiping hands on tea towels and cloths (in place of washing hands)**. Findings from KL2 indicate that the easy, accessible and timely provision of tea towels and cloths discouraged staff from washing their hands and became an automatic behaviour as it was an easier and quicker alternative to handwashing, particularly when working in a busy environment. There were also permissive social norms around this behaviour; staff (particularly chefs) walked around with tea towels on their bodies (for example, tea towels over shoulders) as part of their identity. Therefore, interventions on handwashing need to be considered and designed alongside interventions to prevent [Reusing a tea towel or cloth for multiple purposes](#)'.

Conclusion

This chapter provided in-depth analysis of not washing hands after touching MFP and the factors that influence this behaviour, including illustrative case studies of these factors in practice. The findings presented in this report allow the FSA to better understand this behaviour, and the risks involved.

Understanding the specific influences on these behaviours provides the foundation for future work on designing effective interventions to enable behaviour change. Future research should focus on designing interventions which can enable the positive target behaviours outlined in this report. Following on from the use of COM-B to understand behaviours, The Behaviour Change Wheel ([footnote 23](#)) can be used to identify effective interventions and behaviour change techniques.

1. Percentages total more than 100%, as a participant could wash their hands with and without soap during the same meal occasion.
2. Disposable gloves were available in 3 out of 31 kitchens during the study
3. Percentages total more than 100%, as a participant could wash their hands with and without soap (or use gloves) during the same meal occasion.
4. These factors are not in a hierarchy of importance.
5. These factors are not in a hierarchy of importance.
6. Byrd-Bredbenner, C., Berning, J., Martin-Biggers, J., & Quick, V. (2013). Food safety in home kitchens: A synthesis of the literature. *International Journal of Environmental Research and Public Health*, 10(9), 4060-4085.
7. Thaivalappil, A., Young, I., Paco, C., Jeyapalan, A., & Papadopoulos, A. (2020). Food safety and the older consumer: A systematic review and meta-regression of their knowledge and practices at home. *Food Control*, 107, 106782.

8. Evans, E. W., & Redmond, E. C. (2018). Behavioural observation and microbiological analysis of older adult consumers' cross-contamination practices in a model domestic kitchen. *Journal of Food Protection*, 81(4), 569-581.
9. Jones, A. K., Cross, P., Burton, M., Millman, C., O'Brien, S. J., & Rigby, D. (2017). Estimating the prevalence of food risk increasing behaviours in UK kitchens. *PLoS ONE*, 12(6).
10. Stefancic and Jevsnik, (2020), Nudge tools for improving hygiene behavior among food handlers: Case study. *Journal of Food Safety*, 40(5)
11. Percentages total more than 100%, as a participant could wash their hands with and without soap during the same meal occasion.
12. To place this in context, handwashing with soap occurred on 16% of all meal occasions (including preparing raw MFP and all other foods) and lasted for an average of 16 seconds.
13. Pearson correlation, whether a behaviour was ever observed
14. Separate guidance is available to [FBOs in Northern Ireland](#)
15. Recommended practice is for at least 20 seconds. See: [When and How to Wash Your Hands | Handwashing | CDC](#)
16. While not the subject of the research, many participants were unclear about how they should dispose of raw MFP packaging whilst minimising cross contamination risks.
17. To place this in context, handwashing with soap occurred on 31% of all meal occasions (including preparing raw/cooked MFP and all other foods). It also lasted for an average of 11 seconds. The duration of handwashing with soap in FBOs is lower than that of households.
18. 30 Food Business Operators responded to this survey question. 1 Food Business Operator from the KL2 sample did not respond.
19. Separate guidance is available to [FBOs in Northern Ireland](#).
20. 30 Food Business Operators responded to this survey question. 1 Food Business Operator from the KL2 sample did not respond.
21. [Safer food, better business guidance](#) states 'Hygienic hand rubs and gels can be useful when used as an additional precaution but should never be used as a replacement for effective handwashing'.

22. Only 3 Food Business Operators had disposable gloves available for food preparation in the Kitchen Life 2 study.
23. Michie, S., van Stralen, M.M. & West, R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Sci* 6, 42 (2011). <https://doi.org/10.1186/1748-5908-6-42>