Hand hygiene is one of the most effective methods for preventing cross-contamination. Food handlers have a major role in the prevention of foodborne illness during food production, consequently food handler failure to properly wash hands is frequently reported to be implicated in the spread of foodborne illness1.

Although informative, food safety cognitions are not indicative of actual practices and may be subject to biases1, therefore food handlers may demonstrate awareness of food safety; however, they may fail to translate knowledge into safe practices2. For this reason observational data are superior to survey data3.

However, during direct observations, researcher presence can increase subject reactivity4, whereas video observation provide a more comprehensive analysis over a sustained period, where familiarity reduces reactivity bias5. Previous video observation research has assessed food handler hygiene behaviours at retail/catering settings6,7, however, this method of assessment has been under-utilised in food and drink manufacturing and processing business (FDMBP) environments. Therefore, there is a need to explore the feasibility of conducting video observation of food handlers in FDMBPs to assess hand hygiene practices.

Methods

- In-depth interviews with FDMBP managers/technical supervisors (n=11) identified hand-hygiene protocols, training procedures and explored the acceptability of video-observation to assess compliance.
- One FDMBP was selected to conduct the observational study.
- Footage from the production hand hygiene area (24 hours) was reviewed to assess compliance with procedure. Observed practices were recorded using a specifically designed Qualtrics database.
- Recorded data included: duration, occurrence (sex/entry), gender, role (food handlers/hygiene/engineering), personal protective equipment (PPE), observed malpractices, procedure adequacy and compliance.

Descriptive analysis and inferential statistics were conducted using a Microsoft Excel database and IBM SPSS Statistics package 23.

Results

FDMPBs had unique hand-hygiene protocols with variable details. Interviews identified positive attitude towards using video-observation to assess hand-hygiene compliance. Although it was common for FDMPBs to have cameras recording activity in factories including hand hygiene areas, none had the resource/time to conduct frequent/structured observation of footage, cameras were used for security and would be referred to in the event of an incident.

A total of 1333 entries in to the production hygiene lobby were observed over a period of 24 hours, of which 674 were entering production and 659 were exiting production. Compliance of each entry into the hygiene lobby was observed for compliance with the FDMPB hand hygiene protocol (Figure 1).

Of the 604 attempts to implement hand washing and drying practices prior to entering production, only 2.2% (13 attempts) were determined to be compliant with the procedure, although not compliant, the researcher believed that 8.8% of all attempts were adequate.

- The majority (77.9%) of attempts used soap to wash hands.
- Less than half (45.3%) of attempts wetted hands with water prior to applying soap.
- Less than half (41.6%) of attempts included the use of sanitiser.
- On 13 occasions, staff were observed failing to implement a hand washing/drying attempts and used hand sanitiser only prior to entering production.

Consequently, the majority (97.8%) of hand decontamination attempts implemented before entering production were not compliant with the FDMPB hand hygiene procedure.

Hand hygiene duration

The majority of hand washing attempts were followed by hand drying, however 1.3% entered production without drying hands. 8.9% of hands on personal protective equipment (PPE) (See Figure 3).

Significant behavioural differences between staff roles

Table 1. Significant differences in observed hand hygiene practices at point of entry of food handling staff (n=503) and hygiene/engineering staff (n=131)

<table>
<thead>
<tr>
<th>Hand hygiene practices</th>
<th>Food handlers</th>
<th>Hygiene/engineering</th>
<th>Statistical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>No attempt to implement</td>
<td>9.1 (9.1%)</td>
<td>0 (0%)</td>
<td>X²(1, n=674) = 14.75, p &lt; 0.005, df = 1</td>
</tr>
<tr>
<td>Wet hands with water first</td>
<td>50.5 (50.5%)</td>
<td>29.6 (29.6%)</td>
<td>X²(1, n=674) = 24.16, p &lt; 0.001, df = 1</td>
</tr>
<tr>
<td>Apply soap</td>
<td>80.5 (80.5%)</td>
<td>70.2 (70.2%)</td>
<td>X²(1, n=674) = 7.84, p &lt; 0.01, df = 1</td>
</tr>
<tr>
<td>Rubbing hands together</td>
<td>68.4 (68.4%)</td>
<td>50.5 (50.5%)</td>
<td>X²(1, n=674) = 4.54, p &lt; 0.05, df = 1</td>
</tr>
<tr>
<td>Rinse hand with water</td>
<td>87.5 (87.5%)</td>
<td>77.8 (77.8%)</td>
<td>X²(1, n=674) = 8.89, p &lt; 0.01, df = 1</td>
</tr>
<tr>
<td>Dry with single use towel</td>
<td>97.5 (97.5%)</td>
<td>72.5 (72.5%)</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Use of hand sanitiser</td>
<td>54.1 (54.1%)</td>
<td>77.7 (77.7%)</td>
<td>p &lt; 0.05</td>
</tr>
<tr>
<td>Adequate attempts</td>
<td>9.3 (9.3%)</td>
<td>3.5 (3.5%)</td>
<td>X²(1, n=674) = 11.25, p &lt; 0.001, (Cramer’s V = 0.361)</td>
</tr>
</tbody>
</table>

| Attempts compliant with procedure | 2.6 (2.6%) | 0 (0%) | p < 0.05 |

Hand hygiene malpractices

The hand hygiene malpractices observed during hand washing and drying protocols are presented in (Table 1).

Univariate analysis of video observation of food handler hand hygiene practices in a Welsh Food Manufacturing Business Using Video-observation. Ellen W. Evans* ZEROFIVE Food Industry Centre, Cardiff Metropolitan University, Cardiff, United Kingdom.

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Acknowledgements

The ZEROFIVE Food Industry Centre Research Group wish to acknowledge the FDMBPs that participated in the study and allowed access to on-site footage.

References