

Using an Intervention to Improve Traceability Knowledge and Practices of Food Handlers in Wales

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Introduction

The BRC Global Food Safety standard requires businesses to ensure all staff are trained effectively and must conduct traceability of products and packaging. Research on traceability systems is available but little research is available on the knowledge of food-handlers.

Traceability is a legal requirement that came into force in 2002 via the Regulation (EC) 178/2002 General Food Law, requiring all food businesses to be able to trace a product or ingredient through the stages of production and distribution allowing

BRC Global Food Safety standard requires business to ensure full traceability is achievable for all products, ingredients and packaging (detailed in section 3.6). BRC also requires that all staff are trained effectively, this 'Fundamental' requirement is detailed in section 7.1 (fundamental) of the standard. The company shall ensure that all personnel performing work that affects product safety, legality and quality are demonstrably competent to carry out their activities, through training, work experience or qualification (BRC Global Standards, 2015).

Food businesses operators are legally required to train staff. Regulation (EC) No. 852/2004 on the hygiene of foodstuffs requires businesses that handle food to ensure food handlers are supervised and instructed and/or trained in food hygiene matters commensurate with their work activity (Hygiene of Food stuffs, 2004).

Purpose

To assess the effectiveness of a bespoke intervention in improving knowledge, skills and practices relating to traceability.

Methods

Recruitment: An inclusion/exclusion method of selection was used. A list of criteria was developed to include geographical area, small to medium enterprises (SME) status and certification was constructed and companies who met the criteria were contacted via the Wales Food and Drink Producers Directory (Food Innovation Wales, 2019).

Intervention: A bespoke traceability intervention was developed inline with legal requirements and BRC certification.

Data Collection: A pre and post questionnaire was created to collect knowledge and attitudes towards traceability comprehension.

Ethical Approval: Approval was obtained from the Health Care and Food, Ethics Panel at Cardiff Metropolitan University.

Acknowledgements

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References

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Approach

A bespoke training intervention was delivered to first line managers ($n=54$) in SME food and drink manufacturing businesses ($n=10$) in the South East Wales area on request of technical managers. The training was delivered over a period of two hours, and included bespoke and practical activities which involved reviewing each food and drink manufacturing businesses' traceability procedure. The training was delivered by food technologists who specialise in BRC, either onsite (if available) or nearby, reducing the time impact on the business.

Results: Impact of the intervention

Technical and operational managers across 10 food and drink manufacturing businesses that oversee 6-38 people each (194 in total), selected first line managers ($n = 54$) for traceability intervention training. Participating companies were certified with a mixture of accreditations (9 of the 10 companies hold BRC certification). An assessment tool to measure the knowledge trainees who attended the intervention training was completed; the results are collated in table 1.

Table 1: Trainees agreement with the knowledge and behaviour statements pre and post intervention ($n= 54$)

Percentage that agreed/strongly agreed with traceability statements	Pre	Post	Significant differences
I am familiar with the company's traceability procedures	83%	98%	$p<0.001, z = -5.214, r = 0.502$ (large effect)
I do not receive regular traceability training*	24%	28%	$p>0.05$
I have confidence in my traceability paperwork	70%	94%	$p>0.05$
I am aware of which production paperwork is used for traceability	85%	98%	$p<0.001, z = -4.72, r = 0.45$ (medium effect)
I am aware of the non-conformances on internal audits	81%	91%	$p<0.001, z = -2.37, r = 0.22$ (small effect)
I know the consequences of poor traceability ($n=51$)	89%	98%	$p<0.05, z = -4.62, r = 0.44$ (medium effect)
I do not understand traceability*	6%	6%	$p>0.05$
I can list some documentation associated with traceability	81%	94%	$p<0.001, z = -5.04, r = 0.48$ (medium effect)
I know what my responsibilities are in the traceability process	81%	98%	$p<0.05, z = -4.580, r = 0.44$ (medium effect)

*please note that these questions were negatively reversed to reduce the likelihood of the respondent misreading question.

†Significant data are shown as $p<0.05$ and highly significant as $p<0.001$, alternatively, $p>0.05$ shows an insignificant change.

Non-conformances:

Awareness of non conformances increased significantly from 81% to 91% following the intervention.

Understanding traceability, terms and documentation:

Most of the trainees (87%) claim to understand traceability, increasing to 93% after the intervention. Nearly a quarter of trainees, (24%) were able to select all of the traceability related terms before the training, rising to 61% after the training. More than 1 in 10 (91%) correctly identified where traceability needed to take place, increasing to 98% after receiving the intervention. Trainees selected from a list, which documentation is associated with traceability, 81% pre intervention were correct compared to 94% post intervention. Trainees were able to identify the more obvious documents like 'goods in', 'date codes' and 'batch codes' following the intervention. Some were able to recollect high profile product recall issues (24%) e.g. the horsemeat crisis, however, post intervention, this rose to 67%.

Awareness and familiarity with traceability procedures:

Awareness of traceability responsibilities increased significantly following the intervention, 81% were aware of their traceability responsibilities before the intervention, rising to 98% afterwards. A high number (85%) of trainees are aware of traceability paperwork, compared with 98% after the training. Only 20% were actually able to identify all traceability documents even when prompted with the list pre intervention, compared with 46% post intervention. Pre intervention, 83% of trainees were familiar with their company's traceability procedures, this increased to 98% after the intervention. A Wilcoxon signed rank test revealed a statistically significant increase, $z = -5.214, p<0.05$, with a large effect ($r = 0.502$).

Confidence in own paperwork completion:

The intervention significantly increased the confidence in trainees, 70% to 94% after training, $z = -4.72, p<0.001$ with a medium effect.

Consequences of poor traceability:

Awareness of the consequences of poor traceability, increased from 89% to 98%. Of a possible 162 correct answers, 68% were given before the training and this increased to 93% correct answers after the intervention. Trainee confidence in the consequences of poor traceability also significantly increased, $z = 4.62, p<0.05$ with a medium effect ($r = 0.44$). Trainees confidence in listing documentation, post intervention increase significantly, $z = 5.04, p<0.001$ with a medium effect ($r = 0.48$), as did their confidence in knowing what their responsibilities are towards traceability, $z = 4.58, p<0.05$ ($r = 0.44$) with a medium effect.

Acceptability of the training:

The training intervention was received well by all participating companies. Technical managers were asked to comment on the training, post intervention.

"Training was interactive and made the trainees think for themselves"

Company A (SME with BRC).

"The flexibility regarding the time the training was conducted and that it could be held at our site, minimising the time the trainees were away from site. The training was set at a level that was suitable for all involved"

Company D (SME with BRC).

Figure 1: Quotes from Technical Managers following the traceability intervention.

Significance of research

- In order to address the skills shortage in the sector it has been acknowledged by the ZERO2FIVE Food Industry Centre and Technical Managers in food and drink manufacturing businesses in Wales, that they require personal development in areas of third party compliance such as traceability, in order to improve knowledge and skills to enable growth in the sector.
- In just two hours this bespoke intervention significantly improve the knowledge and practices of first line managers in a number of different traceability areas. The training significantly enhanced awareness of non-conformances, and therefore could impact on reducing them. It also highlighted the consequences of poor traceability and how detrimental this could be to the business if it is not conducted precisely. Finally, trainees understand their responsibility more clearly enabling them to be more effective.
- There is a need to determine the effectiveness of such interventions on reducing the number of non-conformances obtained during a traceability audit.