



The impact of skills and education interventions on food safety outcomes

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Report funded by

Lloyd's Register Foundation
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RS Standards is at the forefront of chain standards development and improvement frameworks and is leading initiatives in sustainability, fisheries management, fishing and supply chain standards internationally with leading organisations.

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Executive summary

Each year, contaminated food causes over 600 million cases of preventable illness and 420,000 deaths worldwide. The impacts are disproportionately felt by individuals and governments in low- and middle-income countries (LMICs), which typically have a different food safety culture and lower standards of food safety education compared with upper-middle or higher income countries.

Raising awareness and skills in the safe handling of food is considered of critical importance in reducing the incidence of foodborne disease. Food safety education and training is one of three core areas of focus for Lloyd's Register Foundation, arising from its Foresight Review of Food Safety, published in 2019.

Whilst the report aims to maintain a global perspective on food safety programmes, the focus of key discussion points is on developing /economically transitioning countries, as this is where there is the greatest mismatch in need versus capacity. To help inform future action on this topic, through a desk-based review exercise and key-informant interviews, this report aims to provide insights into three areas of investigation.

1. What types of food safety and training programmes feature at a global level?

Several food safety programmes have been identified, with leading initiatives being run through organisations such as the FAO, WHO, the World Bank, International Union of Food Science and Technology (IUFoST), and the GFSI. The programmes of these international and regional networks are often linked with a food science R&D infrastructure provided by in-country universities and technology institutions. There may also be partnership building between countries, whereby a country will lend resource to build capacity in its partner; this is often linked to trade and market access. Additionally, private sector initiatives such as the GFSI Global Markets Programme and examples of public programmes (e.g. household food safety campaigns, school and university curricula and targeted interventions) have been identified.

The report categorises food safety training programmes into three main types: formal (e.g. professional qualifications and structured learning), non-formal (semi-structured learning) and informal (on the job, experience-based learning). Examples of food safety training programmes operating are: those running at a global and regional level, those tailored towards the specific business needs of the supply chain (e.g. GFSI programmes), and public funded training programmes that may be directed towards both the consumer and specific at-risk sectors.

In the context of harmonising global food safety education programmes, the IUFoST has taken a leading role, and has recently developed a list of core competencies for undergraduate food safety courses, and a Masters level programme in Food Safety Leadership. A few examples of food safety programmes targeted at school children (from early-years to 16-years) and households were identified for the USA and UK, which could provide some ideas for developing similar initiatives in LMICs.

2. To what extent do these programmes have a demonstrable impact on reducing foodborne illness and fatalities?

The monitoring and evaluation (M&E) of food safety training programmes is explored in Section 3.2. Only 11 peer-reviewed studies were found that measured the impact of training programmes in LMICs. These generally focused on the measurement of impacts of training, of specific training interventions for food handlers in schools and hospitals, and street vendors, doing a before-after comparison. Evidence from the peer-reviewed literature linking food safety training to reductions in food safety incidents is non-existent. This reflects more generally the lack of established food safety M&E frameworks globally.

Standard training plus behavioural interventions (e.g. incentive rewards, management support, and reminders) are the best way of improving handler performance. However, detailed evidence from the scientific literature is lacking with regards to understanding the factors that contribute to successful food safety outcomes.

There is also a lack of information on the costs-benefits of different types of training intervention, level of training (basic vs advanced), as well as other contextual factors that impact on training success such as the availability of tools and equipment, motivation, and cultural dimensions. It should also be noted that employee attitudes, beliefs, and motivation are more influential in shaping food safety behaviour than just knowledge alone. An emerging concept in recent years is food safety culture, used to explain people's attitudes and behaviours towards food safety, in particular what happens in an organisation when "nobody is looking".

A body of evidence that could further be explored is M&E data of internal training that may sit within businesses, and also that which may sit within certification / inspection bodies and third-party certification programme audit reports. With regards to the development of M&E programmes, sufficient thought needs to be spent on developing the M&E framework objectives and hypotheses for testing.

3. How can these programmes be applied in a variety of cultural / social contexts?

The key considerations for developing successful food safety programmes for different cultural / social contexts are outlined in Section 4. Incentives for enhancing food safety management capacity vary depending on where a country falls in the food safety life cycle. Many of the poorest countries are caught in a low-level capacity trap in which political and market incentives to build capacity are weak. It is not necessarily that food safety standards are lower in emerging countries, rather that it is difficult to achieve standards in these low resource areas due to the lack of education and food safety culture.

To have lasting impact on the food safety performance in domestic food safety systems in LMICs, broader development factors such as lack of infrastructure, poverty, and levels of literacy will need to be properly taken into account. This is to ensure food safety programmes are inclusive and not just serving the needs of higher-end markets. Other factors include the undertaking of baseline surveys to understand a country's specific food safety risks and needs, the importance of working with country institutions and building public-private sector partnerships

to expand the role of government beyond just control and enforcement, and considerations for M&E frameworks in LMICs where there may be a critical lack of resource and capability for collecting food safety data.

A food safety programme could involve both a combination of formal and informal training initiatives, organised into broad activity areas. For formal food safety education programmes, curricula can be tailored accordingly to the context of different countries and specific food safety challenges encountered.

Another key consideration is the impact of national cultures on the different methods of learning and training. Programmes should be tailored accordingly by working with educators who have a good understanding of local culture.

This review has provided some examples of different types of initiatives and information resources that could be adapted for different contexts or expanded. There are several organisations with an interest in developing food safety training and capacity building programmes, with often overlapping remits leading to inter-institutional politics and resource inefficiencies in funding and delivery of programmes. Collaboration with existing networks and partnerships between key institutions, allowing resources and information to be shared and allocated efficiently, will be key to maximising impact.

Emerging recommendations

The research informing this report indicates a clear need for a comprehensive framework for evaluating the effectiveness of food safety skills and education programmes that is easily understood, endorsed and accepted by a range of stakeholders. This need is both known to the sector and not easy to achieve: instead, metrics tend to be developed that are appropriate to the needs of specific initiatives or locations.

For a universal framework to be agreed, it is recommended that a series of steps be undertaken, led by Lloyd's Register Foundation and /or other relevant organisation(s). This would involve work with food sector businesses, including processors, retailers, certification bodies, regulators, auditors, academia, private and institutional food safety training service providers, and international organisations (such as the FAO, WHO, Codex) to:

- identify informal publications ('grey literature') arising from food safety evaluation programmes, which may reveal new insight into evaluation approaches and practice
- drawing on existing knowledge, to define, agree and endorse practical guidance for monitoring and evaluation of food safety training in different contexts and scales; and
- use this practical guidance to support a review of the effectiveness of food safety training.

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