

 Kimberly-Clark

PROFESSIONAL

# A Recipe for Food Safety? Understanding Human Behaviour



# Introduction:

## The root causes of cross-contamination

In these unprecedented times, the importance of having a food safety culture has greater emphasis. But to create a food safety culture, we must first understand one of its primary factors: People. Unwashed hands. Production line cross-contamination. Improperly cleaned tools. These all emanate from people and they can all lead to food contamination and recalls.

Despite having a robust system to provide food safety training, education and inspections, things invariably go wrong. The reason? Unpredictable human behaviour and this unpredictability dramatically increase food safety risk.

### Consider these statistics:

- A Food Worker Handwashing and Food Preparation study shows that only 1 in 4 workers washed their hands after preparing raw animal products or handling dirty equipment.<sup>1</sup>
- A 2020 covert-observation case study in some US food manufacturing sites found that 96% of hand washing attempts lasted less than 30 seconds. While 99% used soap, only 56-69% of food workers wetted hands first and 87% failed to rub all parts of their hands.<sup>2</sup>
- A 2019 study found that only 58% of participants reported washing their before hands handling food, while only 48% said they washed their hands after sneezing or coughing.<sup>3</sup>
- A study observed food workers carrying out about nine (9) activities an hour that should have involved hand washing. However, workers only washed their hands in a quarter (27%) of these activities.<sup>4</sup>
- 18.3 percent of BRC audits done globally across 17,113 sites in 120 countries in 2014 found hygiene non-conformities, with the two most common causes being failure to follow documented cleaning procedures and standards for cleaning.<sup>5</sup>



Poor personal hygiene and cleaning practises by employees were cited for the 2015 outbreaks at several prominent dairy manufacturing sites in the United States. Among the hazards observed by the U.S. Food and Drug Administration (FDA) inspectors were:



- Failure to clean food-contact surfaces as frequently as necessary to protect against contamination of food.<sup>6</sup>
- Employees did not wash and sanitise hands thoroughly in an adequate hand-washing facility after each absence from the workstation, which meant that their hands may have become soiled or contaminated at any time.<sup>7</sup>
- Employees touched non-food contact surfaces and food-contact surfaces using the same pair of gloves.<sup>8</sup>
- Failure to store cleaned and sanitised portable equipment in a location and manner which protects food-contact surfaces from contamination.<sup>9</sup>

More recently, in 2018 a South African outbreak affected 1,065 people.<sup>10</sup> The outbreak was traced to a meat processing plant. The company was accused of failing “to take reasonable steps to ensure that the persons working on food premises were suitably qualified or adequately trained in the principles and practises of food safety and hygiene”. One hygiene non-conformity cited was a failure to enforce proper hand washing after toilet visits among food handlers.<sup>11</sup>

Beyond food safety, unpredictable human behaviour can also lead to food recalls and waste. According to a 2019 report published in the *Annals of Operation Research*, 10.9 percent of food waste generated by the Belgian food processing industry is due to daily human error and transgressions made during the food production process.<sup>12</sup>

Unpredictable human behaviour was implicated in a 2017 recall in the United States where 3.7 million pounds of food were recalled.<sup>13</sup> Milk, a Top 8 allergen<sup>14</sup>, ended inadvertently in huge quantities of bread crumbs, which were then used in the making of packaged foods and distributed.

According to the Food Allergy Research and Resource Program (FARRP) at the University of Nebraska, somewhere in the food chain, “an employee or employees of the supplier didn’t follow the procedures” and then milk mistakenly ended up in the bread crumbs, when it’s normally not an ingredient.<sup>15</sup>



As these examples illustrate, contamination events caused by unpredictable human behaviours can result in serious health consequences. Such events are on the rise, increasing at a higher rate than the number of food processing establishments.<sup>16</sup> In fact, in a recent global study of 288 food processing companies, nearly 40 percent reported having experienced a contamination event in the last two years.<sup>17</sup>

## Understanding human behaviour

Even after receiving adequate food safety training, germs were still found on the hands of workers.<sup>18</sup>

Furthermore, a previous study suggests that although food safety training might increase knowledge, it may not always translate to improved behaviour.<sup>19</sup> The link between poor hygiene and contamination is well known. So why is it so difficult to get workers to adhere to proper hand hygiene and cleaning protocols?

Current studies estimate that 95 percent of our brain activity is made unconsciously.<sup>20</sup> Meanwhile, as much as 40 percent of our daily activities are habitual. The rest is fast, reactive and automatic. Breaking those habits is crucial to changing the behaviours that threaten food safety. To do so, we first have to understand how the brain functions. The limbic system is the part of the brain that serves as the control centre for our emotions. It's where we encode and store information from the environment, and it houses our declarative memory (what we call certain objects) and procedural memory (how we do rote tasks such as brushing our teeth). This system of the brain is fast, efficient and automatic, and has tremendous processing power – about 11 million bits per second vs. 40 bits for the cerebrum, which is responsible for conscious action.



The limbic system helps us perform habitual activities, such as walking to the car or using an ATM machine. It's the reason we can drive for kilometres without being able to remember how the last 15 minutes passed and still arrive safely at our destination.

It also is the system that drives 95 percent of consumer behaviour.<sup>21</sup> And, yet, we are completely unaware of it. That's because we use heuristics, or mental shortcuts, to navigate the world. Behavioural Science has become pervasive that today, many global corporations such as **Walmart, Hershey, Maple Leaf Foods, and Pepsico** are applying insights from behavioural science in various aspects of their operations—from understanding and influencing customers better to making more effective decision-making for their teams.

## How to create a food safety culture

The Global Food Safety Initiative defines food safety culture as "shared values, beliefs and norms that affect mindset and behaviour toward food safety in, across and throughout an organisation."<sup>22</sup> Food safety relies on people making unconscious choices every day. That presents challenges, but they are by no means insurmountable. One solution is to use behavioural science to help people make the right choices in an unconscious manner.

The journey to a food safety culture should start not only by understanding the science of food, but also the science of people. As a food safety professional, it's crucial to change your perspective on food safety management. According to Frank Yiannas, author of "Food Safety Culture: Creating a Behaviour-Based Food Safety Management System," the way to do this is to move from a traditional model, which relies entirely on food safety training, inspections and micro testing, to a behaviour-based food safety management model, which focuses on processes and people and is based on food science, behavioural science and scientific knowledge of organisational culture.<sup>23</sup>



In behaviour-based food safety management, numerous factors (physical, organisational, personal) are taken into consideration and how they link together to influence people's thoughts and behaviours.

Unlike traditional food safety management that uses formal authority to accomplish food safety objectives, behaviour-based goes beyond accountability. For example, behaviour-based food safety managers use checks and balances to observe employee behaviours related to food safety, give feedback and coaching (both positive and negative) based on the results, and provide motivation for continuous improvement.



Change will not happen overnight. Leaders can manage the culture shift by establishing timelines and assigning key people to be in charge of the integral elements to the change. These said elements are:

1. Establish a sense of urgency
2. Create a guiding coalition
3. Develop a vision and strategy
4. Communicate the change vision
5. Empower employees for broad-based action
6. Generate short-term wins
7. Consolidate gains and produce more change
8. Anchor new approaches in culture

## What has to change?

While recent improvements in technology have led to testing advances, testing is not prevention. And until we are able to more effectively prevent contamination events and outbreaks, we will not be able to achieve a true food safety culture. According to the GFSI, "to be successful and sustainable, food safety must go beyond formal regulations to live within the culture of a company."<sup>24</sup> Adopting the tenets and practises of behavioural science is one way to accomplish this. Because to improve food safety, we have to change the way people do things. We have to change their behaviour. Behavioural science helps us explain, predict and change behaviour – driving people to change their behaviour for the better. The question is how can we accomplish this?

Training is important but it's not a silver bullet. As Yiannas points out, even when people are properly trained they may fail to do something correctly, which is why it is so important to train and educate in a way that is designed to influence behaviour.<sup>25</sup>



## CASE STUDY

A dry snack food-processing plant in Peru with 250 employees across two shifts was having issues with hand hygiene compliance. Despite being properly trained, workers were not washing their hands long enough, which jeopardised food safety.

In addition, workers lacked the right tools for hand drying – paper hand towels. Their only hand-drying option was jet air dryers with long lines, which caused them to rush or skip hand drying altogether. Many workers dried their hands on their clothing, further undermining hand hygiene since wet hands transfer 1,000 times more bacteria than dry hands.<sup>26</sup>

Both problems were tied to unconscious habits related to the brain system that drives 95 percent of human behaviour.



## The Solution:

The plant partnered with Kimberly-Clark Professional to apply the principles of behavioural science and heuristics, using a simple disruptive intervention to break these unconscious habits.

The intervention, based on Kimberly-Clark Professional's Continuum execution, functioned as a subconscious cue to prime workers to wash their hands longer. The hand hygiene training used the "Hand Stamp" method where food-safe ink was stamped on over 200 employees' hands per shift during 28 days. The hand stamp is designed to be removed only after proper hand washing, increasing the friction applied in palms, as well as the time spent on hand washing and drying. The intervention also used visual cues to drive attention to proper hand washing protocols. None of the employees were taken to a dedicated session to explain the intervention nor the desired objectives.

To address the problem of workers failing to dry hands properly, they were given single-use hand towels, which eliminated the problem of long lines at the jet air drying station.

## The Results:



Achieved 6X more<sup>27</sup> clean hands without additional classroom hand hygiene training. The application of the Hand Stamp method sufficed.



83 percent of food workers ended with bacterial counts of <10 CFU<sup>28</sup> per hand, as measured through multiple microbiological swabbings.



Decreased the number of contaminated hands (>1000 CFU per hand) by 95 percent. A key component of the success was the method of hand drying itself.<sup>29</sup> Drying with paper towels reduces bacteria on fingers by up to 77 percent that remain after washing.<sup>30</sup> Using a jet air dryer disperses 1,300 times more germs than drying with paper towels.<sup>31</sup>



## Conclusion

As the example in the Peru food processing plant demonstrates, combining the power of behavioural science with products designed with hand hygiene compliance in mind helps to improve contamination control practises. Food safety professionals who are committed to creating safe food cultures understand that it takes more than dedication and adherence to food science, food safety training and inspections to obtain the desired results. To change workers' behaviours, managers need to focus more on behavioural science—including the workers' physical environment and the organisational culture. That is the recipe for food safety success.



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