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Food Safety = Culture Science + Social Science + Food Science



Food safety culture works at the intersection of food science, organizational culture, and social cognitive science.¹ We need to understand the interactions between traditional food sciences, including food safety, and the sociocultural sciences to determine what food safety culture is and how it can be measured and improved. Although everybody is talking about it, food safety culture is a relatively new concept for the food industry, and it is useful to look back at food safety assurance developments in recent history to understand our route into food safety culture and why it is so important today. In this article, we will consider how thinking in food safety culture has developed and how blending the food and sociocultural sciences together helps us improve food safety performance.

The Path to Food Safety Culture through HACCP

Starting with food safety management systems and, in particular, Hazard Analysis and Critical Control Points (HACCP), most people will know very well the history of HACCP through the U.S.-manned space program and the work of the Pillsbury Company.² Integrating failure mode effects analysis (FMEA), which has been used since WWI,

this pioneering work in the 1960s and '70s laid the foundations for food safety systems and practices that still form the mainstay of food safety management today. Thirty years ago, a new graduate entering food manufacturing would have been lucky to get involved in early HACCP if they worked for one of the early adopting companies. Remember, this was before publication of the HACCP principles by Codex and the National Advisory Committee on Microbiological Criteria for Foods,^{3,4} and it was through these texts and guidance, as well as some early regulatory and private standards, that HACCP really started to take off in the 1990s. Early on, HACCP was reportedly an effective and economical way to prevent foodborne disease by the World Health Organization (WHO),⁵ and this was a widely shared view that led some governments to believe that its implementation was a remedy for all of their country's food safety issues.⁶ In some markets, HACCP was microbiology and compliance driven, while others recognized its role in continuous improvement and doing the right thing.

Through the 1990s, there was much focus on HACCP training and the development of formal HACCP plans, with the later understanding of the importance of also formalizing the supporting prerequisite programs to control the general operational hygiene conditions. However, foodborne

THREE TAKE AWAYS

- ❑ Food science, including food safety, needs to be applied together with social and cultural sciences to assure effective food safety management.
- ❑ A strong food safety culture achieved by properly analyzing business processes and building systems to be proactive and continually evolving.
- ❑ The social science toolbox helps us to engage the workforce using transparent and effective communication and behavior change tools to establish company values and implement personal commitments to food safety.

illness outbreaks continued to occur, and auditors of HACCP systems started to see problems, both with the design of HACCP plans and their implementation.

HACCP was, and is, a logical approach to food safety control. By identifying up front the hazards that could occur and potentially make consumers ill, appropriate control measures could be designed and implemented to stop this from happening. While great in theory, this was not working so well in practice; steps needed to be taken to ensure systems were working effectively and were not just a check-list approach.⁷ What was missing was the social science side and an understanding of the crucial role of people from a scientific perspective.

Some aspects of people systems, such as knowledge, skills, and training, have long been associated with effectiveness of food safety management systems and HACCP in particular,^{3,6,8-10} and these are also items that have been identified as barriers to successful food safety management.¹¹ Also identified as important in early HACCP guidance was management commitment,^{3,4,8} which was thought to come from an understanding of the potential impacts of unsafe food on the consumer and the business, in other words, senior managers seeing food safety management as the right thing to do. HACCP awareness training was often suggested for senior managers and the workforce in general to help share this understanding and commitment throughout food companies, and the demonstration of commitments by managers was seen as important for workforce commitment and behavior. These early clues to the impact of people and culture on effective food safety management systems (FSMSs) have evolved into the considerations of organizational

and food safety culture today.

Even though the U.S. started implementing the Food Safety Modernization Act (signed into law in January 2011) and numerous other countries have implemented or are implementing modernization attempts to their food safety systems, we continue to have increasing numbers of major foodborne outbreaks. According to the WHO, there are about 420,000 deaths a year from foodborne disease and about one-quarter of those deaths (~125,000) are children under 5 years old.¹²

Some key questions on the table are: Do HACCP-based FSMSs (HACCP-FSMSs) still work? Is the problem with the core principal of our HACCP-FSMS? Or is our food safety culture not truly developed? We propose that HACCP-FSMSs work, but our food safety culture is currently in disarray. We need both to be working hand-in-hand to deliver safe food 24/7 and, of course, we need goals and measurement systems to understand the maturity and effectiveness of both the food science and culture science elements.

Some Symptoms of a Food Safety Culture in Disarray

Food hazards and business risks

While we might have good systems to identify, assess, and control food safety hazards through HACCP, we need to recognize that our systems might not work if our food safety culture is poor. We also must recognize business risks where procedures are not effectively understood, honored or enforced. Economic adulteration is a good example where food safety may not initially appear to be an issue, but the melamine incident^{13,14} and others have proved otherwise. Another business risk example relates to the arbitrary extension of shelf life of frozen meat to prevent

financial loss. Food safety science may not have had a problem with extending the code life, but customers receiving the finished product and the consuming public reacted differently. Through not understanding the potential consequences, the loss for both the manufacturer and its customers was extreme. These two examples have their roots in culture. The foundation of a company's food safety culture is defined in corporate values, but other factors such as customs of a population may play a role in employee actions. Managers of food safety must recognize the scope of actions that can create a food safety hazard and business risk.

Quality department is the policing department

In the two prior examples, loss of life and loss of business were the consequences of failing to have science and values effectively deployed. These are extreme examples, but each recall, withdrawal, and food safety-based embargo represents a failure to effectively deploy the necessary process to prevent. Does our organizational culture promote prevention? Do programs and projects reflect an understanding of our values? Has food safety and quality taken on the role of the Good Manufacturing Practices/hazard police? Our goal in manufacturing is to create habits within our employee based on doing the right thing. This applies to every production worker and management associate or team member rather than just food safety and quality. When correct actions are performed without thinking, then the culture has reached a new level of maturity.

Settling for executing programs at the existing level – Compliance vs. continuous improvement

The development of preventive

practices designed to address defined hazards and reduce business risk is primarily led by the food safety department. Some misguided management priorities that we have encountered include team members not having time to work on a project that will significantly improve food safety as well as providing data to reduce risk because they are too busy preparing next month's customer or third-party audit. In the absence of effective or strong leadership, managers often tend to stay in their comfort zone and work to set requirements rather than making continuous improvements.

Food safety measurements based on prevention and prediction vs. verification of the effects of the loss of control are simply not practiced enough. Most environmental monitoring programs by design are only verification driven. Verification positives mean we have lost control of the process and food safety issues can arise. Finding indicators of the potential loss of control vs. finding a zone 2 or 3 verification site, contact surface, or product positive should produce different reactions. We must recognize risk and measure the critical factors and indicators of process control for continuous improvement.

Lack of personnel and cross-functional team involvement

Let's take a 20,000 ft. view of communication systems in plants. Daily production and quality paperwork is generated by operations and food safety and quality. The information moves upward in the organization in the form of various reports. Some results are shared with the workforce, typically volume and efficiency, along with problems encountered. The workforce often gets the opportunity in some form to re-inspect, recondition, or rework product that management doesn't want to ship. This

downward only communication chain can make individuals feel like mushrooms: "Keep me in the dark and feed me manure." This may be an extreme example, but the most common employee complaint is the lack of communication and/or feedback, in other words, personnel are not involved.

Often missing is an open transparent discussion between leaders and employees about what's most important to individuals and their companies. This will lead to conversations about competing priorities and different expectations. On the team side, many of the program maintenance issues raised in audits today can be addressed easily and quickly by cross-functional teamwork. The problem is that we don't do enough of it, so we are losing the chance to enhance employee engagement and buy-in while driving involvement through the organization. These management actions help define accountability as well as enhance food safety culture.

Imbalance between use of positive and negative consequences

In many food companies, plant managers are recognized for their ability to make quick decisions and create drive to get it done. Food safety management's role is to deploy science to help plant management promote safe food production through the organizational culture, values, and norms.

The successful use of consequences helps in continuous improvement of food safety culture. The outcomes of our measurement systems need to create more positive reactions than negative. Overwhelming negative consequences drive negative reactions and a disengaged workforce.

Issues with food safety skills and technical training

Would you knowingly allow a surgeon to do surgery on you or your

family when the surgeon has only had 18 hours of training to be a surgeon? We rely on individuals in the food industry with as little as 18 hours of training on HACCP to develop our FSMSs. Even with new FSMA training requirements, only 18–20 hours of training are needed to get your Preventive Controls Qualified Individual certificate required for every manufacturing facility selling into the U.S. or manufacturing goods sold in the U.S. Are 18 hours enough?

Some of us get calls asking if we know of someone that can step into a company's open food safety and quality manager position, but oftentimes the company only wants to spend a certain figure for their FSMS expert that would attract a graduating food science college student. Often the response to such an inquiry is "students don't know enough," but rather than increasing the salary budget, companies will promote someone from inside, frequently with no formal food safety education or training into the position. Then, these new hires are sent off for the 18-hour HACCP course and are suddenly the company's food safety expert. On the other hand, the lack of appropriately trained graduates is a real and significant problem, partly because food science curricula often don't include enough food safety science or social science content, and partly because students see other work areas, such as product development, as more exciting career paths.

We can have the best knowledge at the corporate office, but if we do not have effective, robust, and continually improved training programs, we will not succeed. These problems occur in both small and large companies. The small company may not be able to afford to train employees, even though one issue could shut them down permanently, and the large companies



Figure 5.1. Some tools from social and organizational sciences to help you in your work to improving food safety performance.*

can afford the food safety professionals, but sometimes the information is kept at corporate and not disseminated down throughout the processing facilities.

Making Science-Based Improvements

Use the social and organizational science toolbox to bring your food safety culture back on track

Acknowledging that we have challenges with connecting the proven principles of food safety management such as effective and dynamic HAC-CP programs, what can we do? We suggest four areas (Figure 5.1) from the social science toolbox that have worked in our experience to improve food safety performance and continually improve the food safety culture.

Drive food safety through your company and personal commitment

Science and values define the right

thing to do. Our friend, Dave Theno, carried a picture of Lauren Rudolph, who died at age 6 from the Jack in the Box outbreak, in his briefcase. He would pull it out and ask “what would she want me to do?” when faced with a significant food safety decision. This made the value of the decision real and helped guide him to his decision. Does each of our company values enable us to put a human face on our decisions? When we educate or train, do we make it real and explain “why”? Do we use or engage the company values when we make decisions? Are the effects and potential impacts of our programs evaluated against our company values?

Does company management, including food safety management, realize how to drive the company and food safety culture away from firefighting and into a preventive and predictive state? Can the effects of those preventive and predictive prac-

tices be internalized and become a key component of the overall business strategy? The consideration of these questions when establishing food safety goals is essential for continually improving your food safety culture.

Our programs and procedures must be in concert with company values. We must interpret and deploy values on a daily basis and show through our actions that they are what we stand for. Leadership is leading by doing and ‘walking the talk.’ Food safety leaders must expect value-driven actions and accountability. These words make a lot of sense on paper, but how often have you held your supervisor or boss accountable or challenged them regarding a decision, procedure, or activity that had food safety implications? Our ability to hold those above, below, and equal to us accountable for food safe actions and decisions is key to driving the appropriate food safety culture.

As food safety leaders, our management obligation is to use those values at all levels in the organization to drive food safety culture.

Workforce engagement

Engaging the workforce in teams promotes our ability to increase accountability and responsibility. Engagement through tools such as brainstorming, cause and effect diagrams, and root cause analysis helps create and allows us to understand preventive controls. Diligent use of such tools leads to the capability for more advanced tools such as FMEA and/or other options from the lean manufacturing toolbox. Effective use of teams and teamwork helps move the organizational knowledge to the frontline while enabling cross-functional communication and sharing of ownership of change.

Communication tools are a major part of improving engagement. Food

safety engagement in daily team huddles as well as longer, for example, weekly team meetings is critical. Food safety metrics along with human health and safety must be top agenda items in these communication activities. Food safety and quality must ensure the communication includes recognition of project work to improve quality and productivity as well as food safety. Use of these tools to close the communication loop is an essential component of improving food safety culture. This approach also addresses the need for better communication and provides employees with channels for more direct dialogue on critical issues. This increases the employees' sense of impact on the job, which drives engagement.

Practice and success demonstrates two fundamental changes are required of us as food safety leaders at all levels to attain results through engagement:

1. We must abandon the view that we are or should be the sources of all solutions in the food safety space and truly open up to the reality that inclusion of broader teams leads to more and better ideas and solutions. Therefore, we need to evolve from direct knowledge holders to coaches and facilitators who steer cross-functional group actions from our informed food safety perspective, developing real understanding in our teams closer to the issues through the use of, for example, huddles and Gemba walks, to find out and address what is really happening.
2. We must ensure that the emphasis shifts away from cost in the short term to the improvement of process and other variables that focus on making the attainment of the finished goal easier for the teams—eliminating steps, changing methods, changing lay-outs, and giving more control at the point of decision and adjustment, within the framework of food safety.

Eventually, costs and value will be improved. Leaders who put people first, ensure their teams know what is expected, and give the teams the tools to attain those expectations will have greater success than those that put cost first.

The difference is in how management sees itself—as the sole creator of solutions or as a coach, facilitator, and conduit for the teams to actively transform how they do their jobs each day, which ultimately improves their value delivery (and engagement) at work.

When these systems reinforce company values, alignment to corporate initiatives strategic plan and initiatives can be realized. Food companies with a high food safety maturity level have a preventive mindset, and accountabilities and responsibilities are aligned for everyone. Employees feel empowered and understand why food safety procedures must be practiced. When an employee in a highly mature company enters the factory, their commitment is consistent to the company's values and results follow.

Make food safety a habit

Social science teaches us how to turn instructive actions into habits without thinking. Habitual actions to situations need to become acceptable norms within the various work groups in the plant and company. Acceptable norms mean the leaders of these various work groups accept and expect these actions in response to the situation. Think of street gang activity and their ability to establish acceptable norms. Take your memory back to high school and the cliques that autonomously formed. Street gangs and high school cliques create value-driven reactions to situations. The effects on new members initially changes beliefs then creates habits. How do we, without imposing gang

activity, address the work groups to recognize, accept, and react in a food-safe manner?

Behavioral change tools from social science can help with this, such as those from the 4Es model,^{15,16} which considers the systems and capacity to enable change, working with trusted intermediaries and networks to engage change, the shared responsibility needed to exemplify change, and the need for incentives and disincentives to encourage change.

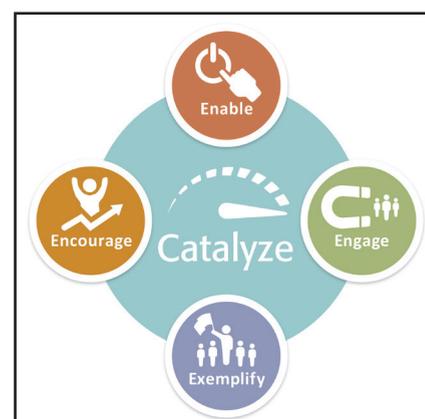


Figure 5.2. The 4Es Model of Behavior Change*

Figure 5.2 shows that we need to: **Enable**, making it easier by providing people with the support they need to make the right choices; **Engage**, getting people involved early on so that they understand what they need to do and helping them develop a sense of personal responsibility, developing new 'social norms'; **Exemplify**, leading by example in line with company values and policies; and **Encourage**, giving the right signals, reaffirming benefits of change and providing regular feedback. Looking at all the 4Es, we need to consider if the overall package of interventions is enough to catalyze change; it is important to review this on a regular basis as progress is made.

Transparency and communication

Scientific, technical, and societal elements are different today than they

were 10–20 years ago. Twenty years ago, social media did not exist as it does today. Transparency was not a norm. “What you don’t know won’t hurt you” was more the norm. Today, we all operate in glass houses. Every action and reaction has some level of visibility. Our current state of communication technology has enabled cell phone pictures and videos to touch thousands in just minutes. Getting the culture right is one way of protecting business in this arena.

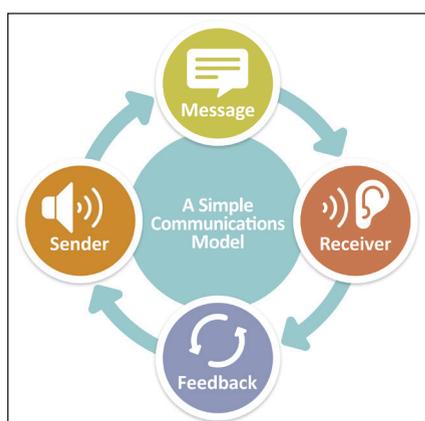


Figure 5.3. A Simple Communication Model*

When you ask “What can we as a company do better,” the very common response is “Provide more communication.” As usual, the devil is in the details—understanding what sort of additional communication is needed along with what the receivers expect and interpret from the communication are crucial (Figure 5.3). The truth is that most companies that increase the number and frequency of communications don’t move the needle—it isn’t about *more* communication, it is about *better* communication—and to make communications better, we need a fundamental understanding of how the communication process works, what folks expect and need from communications, and how that differs from what they are getting. Without that understanding, many attempts to improve communications will fail.

Figure 5.3 shows the communication cycle in its simplest form, but we need to remember that the receiver has to decode the message to his/her own understanding,¹⁷ and this might be affected by the chosen communication channel, for example, email, telephone, in-person briefing, etc., and by nonverbal signals. In other words the chosen communication channel can add ‘noise’ that interferes with the intended message being understood.

Our current methods for sourcing feedback—annual engagement surveys and survey technologies like SurveyMonkey®—often take too long and because of the design, build, deploy, analyze, and report-out cycles required of our current feedback processes. Leaders are too slow to take action—it takes 3–6 months on average to move from data collection to action planning on a typical annual employee survey. Many companies don’t even get to developing action plans, which erodes organizational trust. The bad news is that our organizational feedback processes are entrenched by habit and woven into the fabric of core business processes. It takes a progressive and forward-looking leader to spot this trend—you have to be courageous to try something new!

The risk to companies who don’t adapt to the real-time feedback trend is great. After all, in the modern knowledge economy, employee engagement is the capital that keeps the economic engine running. If we don’t know how our employees feel today, we need to find out and ask them what they think. We need to respect them for their unique perspectives and experiences. In this way, employees feel connected emotionally to the purpose of their organizations and know how their contributions are driving their businesses forward. We can’t foster this type of culture just by

checking in once or twice per year.

How to blend the food and social science together for food safety effectiveness

The ease of implementing new food safety programs is directly proportional to the maturity level of the food safety culture. Is the ease of implementing new food safety programs then a measure of food safety culture? The elements affecting ease of implementation include trust, engagement, buy-in, intention, belief, understanding, and behavior, among others. We have discussed these issues and some of the questions in the thought process of those who are tasked with implementing, complying with, and maintaining changes. People ask “Is this the right thing for me, for my department, for the company?” “Will this make my job easier or harder?” “Are we capable of accomplishing and complying?” “Is this really going to a sustainable?” Addressing these questions as part of the implementation process helps address the culture or social science side of the proposed change.

To implement effective change, we must blend practical knowledge from organizational culture science, social sciences, and food safety science. For example, a company value reads ‘the customer always comes first.’ Senior leaders act on this value by holding sales accountable for engaging key customers to brainstorm new product ideas or improvements to existing products. Sales knows how to assess food safety hazards and ensures that representatives from both customer and company food safety are involved in the brainstorm. A new product is developed, and the product development team assess hazards and physically conducts brainstorming sessions at the production site with involvement from the leadership team to frontline employees and, together,

they proactively identify hazards and risks when producing the product. As this example shows, there are two prevailing change management principles at play: planning and involvement. We all go through the same emotional spectrum when experiencing change that is important to us, and, as leaders of change, it is our responsibility to use the known principles of social science to make the 'pain' of change be short and controlled.

Conclusions

Food science, including food safety, needs to be applied together with social and cultural sciences to ensure effective food safety management for consumer and brand protection. A strong food safety culture makes strong business sense and is achieved by properly analyzing business processes and building systems to be proactive and continually evolving rather than reactive and static. This includes utilizing the social science toolbox to engage the workforce using transparent and effective communication to share and establish company values and personal commitments. In this way, it is possible to drive food safety forward and continually improve standards, making food safety a habit for every employee every day.

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