

Measure What You Treasure: Food Safety Culture

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A culture of food safety is built on a set of shared assumptions, behaviours, and values that organizations and their employees embrace to produce and provide safe food. Employees must know the risks and hazards associated with their specific products, know why managing these hazards and risks in a proactive and effective manner is important. In an organization with a strong food safety culture, individuals and peers behave in a way that represent these shared assumptions and value system and point out where leaders, peers, inspectors, visitors and others may fail to protect the safety of both the consumers and their organizations.

A number of factors influence these organizations, such as, changing consumer demographics, emerging manufacturing hazards and the regulatory environment. The UN predicts that the number of people over 60 years will double by 2035, the number of diabetes patients will increase by 35% (International Diabetes Federation), and the number of individuals living with dementia will increase by 69% (Alzheimer's Disease International). This poses an increased urgency for food manufacturers as these population cohorts are more susceptible to foodborne infections or may have challenges with food preparation instructions.

Much has been published on food safety culture and we owe it to the front-runners to use their work, to go deep into practical, everyday challenges and to continuously strengthen organizational and food safety cultures (Schein, 2010). An element common to most of these publications is a reference to the importance of behaviours (Ball, Wilcock, & Aung, 2009; Hanacek, 2010; Hinsz, Nickell, & Park, 2007; Jespersen & Huffman, 2014; Nickell & Hinsz,

2011; Seward, 2012, Yiannias, 2015). There is a re-newed recognition of the importance of individual behaviours specific to food safety and personal self-discipline in food processing and manufacturing organizations. Employees throughout the organization must be aware of their role and the expected food safety behaviours and are held accountable for practicing these behaviours. Imbedding food safety culture in an organization can be very challenging given the to the need to carefully define appropriate behaviors, the difficulty in changing learned behaviors and the complexity of objectively evaluating the level of food safety culture in a company. This article is an attempt to define useful food safety behaviours and to describe a behaviour-based method that you can use to measure the maturity of your organizations food safety culture.

Defining measurable behaviours

Behaviours is the element that, when combined with results, creates performance (Braksick, 2007). Behaviours, if used to measure and strengthen food safety culture, must be defined carefully in a **consistent, specific, and observable manner**. Fishbein and Ajzen, authors of multiple publications on the *Reasoned Action Approach* (Fishbein & Ajzen, 2009), teach us how these three factors can be used to predict and explain human behaviour, attitude, perceived norms, and perceived control. They also teach us that behaviours can be defined consistently by including four elements (Figure 1).



Figure 1: Four components to a consistently defined behaviour

Case: CCP operator on a baked chicken line. I work in a chicken processing company and am responsible for monitoring the internal cook temperature of chicken breasts after the product has gone through the oven. One of the important behaviours for my role could be defined as “Measure temperature of chicken after oven at pre-determined time intervals”. This behaviour is consistent as it includes all four elements of the behaviour definition (Table 1). The content of the behaviour is defined in a way that makes it relevant for me, the CCP operator, and I am clear on the assumptions made by others on the processing line about my behaviour. The behaviour is observable and most people would be able to enter the processing area and observe the behaviour and assess if it is performed as needed, YES or NO.

Leaving out any of the four elements of a behaviour definition or becoming too general in your statements leads to poorly defined behaviours (Table 1) that are difficult to use as an assessment of behaviours and ultimately as a measure of the sites for food safety culture.

Table 1: Scenarios of defining behaviours

Scenario	Behaviour	Action	Context	Target	Timing
Consistent, relevant, and observable	I measure and record temperature of three chicken pieces every hour at end of oven.	Measure and record temperature	End of oven	Three chicken pieces	Every hour
Missing definition elements	I measure temperature at pre-determined intervals.	Measure temperature	Not defined	Not defined	Pre-determined time intervals
Not specific	The product is cooked and checked every hour	Not defined	Not defined	The product	Every hour

Not observable	The product is cooked and I check to see if it meets standard.	Checked	Not defined	The product	Not defined
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Behaviours are observable events and for this to be true, a behaviour must be defined objectively in a language clear to everyone involved. It can be helpful to target a readability level of grade 6 as it forces everybody writing the behaviour to avoid words that are not understandable in plain language.

Using behaviours to measure food safety culture

Assuming that behaviours are defined in a **consistent, specific, and observable** format, how do we decide the critical few behaviours that get measured? A suggested method is the use of the food safety maturity model (Table 2). The model outlines five capability areas that a processor or manufacturing company can use to measure its current state and to set priorities and direction. One capability area is *Perceived Value* that describes how an organization might see the value of food safety. The maturity level ranges from a low level of maturity of “*Checking the box because regulators make us*” to a high level of maturity for “*food safety is an enabler for ongoing business growth and improvement*”. Consistent, specific, and observable behaviours can be defined for each of these stages of maturity. By assessing the performance of these behaviours we can now aggregate these assessment scores into a site or organization measure of the maturity of the site or organizational food safety culture. It is important to note that the maturity score does not measure “good or bad” culture. The measure is one of progression along the food safety maturity model scale as can therefore be used to highlight areas of strength and help priorities areas where improvement would be impactful for the individual organization.

Table 2: Food Safety Maturity Model. NOTE: The Food Safety Maturity Model was developed by Lone Jespersen in collaboration with Dr. John Butts, Raul Fajardo, Martha Gonzalez, Holly Mockus, Sara Mortimore, Dr. Payton Pruett, John Weisgerber, Dr. Mansel Griffiths, Dr. Tanya Maclaurin, Dr. Ben Chapman, Dr. Carol Wallace, and Deirdre Conway.

Paths		Stage 1 DOUBT										Stage 2 REACT TO										Stage 3 KNOW OF										Stage 4 PREDICT										Stage 5 INTERNALIZE									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9					
Stage Name (Identifier)																																																			
Capability Area (Identifier)																																																			
Perceived Value		Completing tasks because regulators make us do so. Food safety performance data is not collected and reported regularly to all stakeholders.										Little to no investment in systems (people and processes) to prevent food safety firefighting. Little understanding of true food safety performance.										Food safety issues are solved one at a time, getting to the root of the issue, to protect the business. Strong, data-based understanding of true food safety performance.										Re-occurrence of food safety issues is prevented by use of knowledge and leading indicators.										Ongoing business improvement and growth is enabled by food safety.									
People System		Tasks are only completed when senior leader's demand, without understanding responsibility, the task, or why it is important. Tasks being completed out of fear for negative consequences. Top management having to individually certify the accuracy of food safety information.										Responsibility for problems are established as the problems are discovered and solved mostly by use of negative consequences. Tools are invented as new problems arise and the tools are rarely incorporated into systems for future use.										Deeper understanding for the importance of foods safety systems, where responsibilities are clearly defined and communicated, is gained one issue at a time. Consequences are mostly managed when mistakes happen, seldom through a defined plan, with both positive and negative consequences.										Developing and assessing tools for improving processes through knowledge and data. Responsibilities and accountabilities are discussed, communicated, and assessed with patience. Processes are developed, including consequences (positive and negative), and managed preventive through communication and assessment.										Strategic direction is set across the complete organization with defined accountabilities, responsibilities, and food safety as one of the business enablers. Preventive definition and continuous improvement of specific food safety behaviours, consequences and tools.									
Process Thinking		Unstructured problem solving to remove the immediate pain.										"Plan, Do, Check, Act" with emphasis on control in the check phase and expectation of a immediate 100% perfect solution.										Structure problem solving with significant risk of over analyzing.										"Plan, Do, Study, Act" with emphasis on study and not control. Problem solving is accepted as an iterative process.										Horizon scanning and continuous improvement are used to identify risks. Risks inform the development and/or improvement of mitigation plans. Mitigation plans are integrated in the global business management system.									
Technology Enabler		Little technology being adopted and few see this to be an issue.										Responsibility is left to the individual to identify data needed and there is a high reliance on the individual to derive information from the data.										Standard technology is adopted on-going and standardized training provided to individuals as needed. It is unlikely to see that issues are prevented by use of data-driven information.										Data is collected in a precise and accurate manner to constantly improve processes. Automation is used in a limited or fragmented way.										Integrated, global information systems (e.g., ERP) are in place in the organization making it quick to adapt, improve, and use automated workflows.									
Tools + Infrastructure		Minimal tools in the hands of few individuals.										It takes a problem to get the right tools. This often leads to findings the right tools in a hurry and resulting in rework.										The organization invests readily in the right tools and infrastructure when solving a problem calls for it.										Food safety tools and infrastructures are in place and are continuously improved for ease of use and cost of the organization.										Investment in tools and infrastructure is evaluated long term and prioritized along with other business investments.									

For more details on the food safety maturity model visit www.cultivatefoodsafety.com.

Call to action

The organization's culture will influence how individuals throughout the group think about safety, their attitudes towards safety, their willingness to openly discuss safety concerns and share differing opinions with peers and supervisors, and, in general, the emphasis that they place on safety. However, to successfully creating, strengthening, or sustaining a food safety culture within an organization the leaders must truly own it (Yiannas, 2009) and promote it throughout the organization.

The call-to-action for food industry leaders and regulators is to embrace a standardized measure of food safety culture to allow for comparison and sharing within an organization and between companies. “Food safety is everybody’s responsibility” was the theme of the recent GFSI Global Food Safety Conference in Kuala Lumpur but to act on this with food safety culture as the ultimate outcome, we must adopt standardized measure. The GFSI benchmarking technical working group is an ideal forum to continue this dialogue.

During the upcoming GMA Science Forum April 12-15, 2015 you will have a chance to join the conversation at a practical and detailed level during the pre-conference Food Safety Culture workshop (April 12) with facilitators from leading organizations and to learn from the meeting Food Safety Culture Signature Session (April 13) on what our industry requires to enable this level of standardization and collaboration. For more information and to sign-up, visit <http://www.gmaonline.org/forms/meeting/Microsite/scienceforum15>.