Reflecting on events that have shaped our focus on food safety

As Fortress Technology celebrates its 20th anniversary in Europe, this article reflects on some of the biggest events and product developments that have shaped today's focus on food safety and anticipates some of the trends that could be around the corner.

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At the turn of the 21st Century global food safety really started to gain traction. In the preceding two decades HACCP, first introduced by NASA in the late 1950s to ensure food safety for the manned space program, started to be implemented by the wider food industry, and in the year 2000 the Global Food Safety Initiative (GFSI) was founded.

Since Fortress started supplying its Never Obsolete metal detection systems to UK and European food factories in 1999, the shift from a lackadaisical attitude to an extreme focus on food safety is highly evident, reflected by the level of investment in inspection equipment across factory floors.

In 2000, the safety focus tended to be more confined to the largest manufacturers. Nowadays, SMEs too regard it as a competitive advantage rather than a tiresome and costly business burden.

Back when Fortress first entered the food metal detection market, technology was generally limited to single fixed frequency 'balanced coil' systems. However, digitalisation and automation combined with heightened awareness of food safety and more stringent rules, has seen the technology progress significantly, particularly in relation to inspection and metal detection sensitivity.

A sign of the times

Food safety programmes in the early days were generally the domains of the very largest food manufacturers, who recognised the extent of brand damage should products need to be recalled. Today, retailers, legislation and prolific consumer awareness drive food safety. Any incident can go viral instantly. It is this type of social awareness that can really hurt a food manufacturer.

NASA essentially invented the HACCP approach to food safety.

From allergen incidents to sabotage, fraud to contaminants, bad news is all consumers will hear. Few of us can erase from memory the spill out of the European horsemeat scandal.

Propelling food fraud into the spotlight, Irish food inspectors detected horsemeat in beef burgers. Shortly after, similar incidents were reported in more than 10 other European countries. Five years on, traceability and supply chain integrity is now as embedded in food safety as contaminant control.

According to industry experts, the earliest adopter of the Hazard Analysis and Critical Control Point (HACCP) principles was the NASA space program. Sixty years ago a team of food scientists, Pillsbury engineers, and the US Army collaborated with the National Aeronautics and Space Administration to build quality checks and ensure safe food on space expeditions.

NASA's engineering and weapon Critical Control Points methodology formed the foundation of the program. During the 1970s, this mindset started to infiltrate food production plants. Towards the end of the decade, HACCP really started to take hold, with the introduction of sector-specific guidelines.

Some of the largest supermarkets then started to flex their powerful muscles, starting a snowball effect that saw the profile of contaminant detection increase significantly.

With retailers now insisting on site audits on a more frequent basis, contaminant detection is not just a tick box exercise. Manufacturers have to demonstrate they are living by their food safety principles every day.

From research Fortress has conducted with manufacturers over the years, naturally occurring food contaminants, such as pips or shell, remain the most prevalent consumer complaint, closely followed by insects. However, contaminants that could potentially harm a person – such as glass, rock or metal – are still the most potentially brand damaging.

Given that metal is everywhere in the food supply chain, Fortress intentionally focused its efforts on addressing this harmful contaminant risk. Within factories are a wide array of mixers, dicers and slicers – most made from stainless steel. Yet, metal could also be introduced upstream.

For example, a can of soda discarded in a field of grain, which is then harvested using powerful tractors, means that metal fragments, many of which are non-magnetic, can easily be dispersed. In recent years the company has seen a number of farms install metal detectors to inspect vegetables, potatoes and grains in bulk before shipment to manufacturers for processing.

To better intercept stainless steel contaminants, which can be trickier to identify, Fortress created the Interceptor range. For items like meat, cereal, baked bread, dairy and ready meals, the Interceptor unit provides a reliable option for addressing product effect, increasing stainless steel metal detection by 100% and reducing false rejects.

Evolving technology

In the last decade, metal detection technology has progressed significantly. Some of the latest advancements occurred around the same time (2011) the US enacted its most sweeping food safety reform to date – the Food Safety Modernization Act (FSMA). With this reform, rather than just

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analysing hazards, the focus has shifted towards prevention.

In the early days, fixed frequency metal detectors were typically the only option. Although still used today, this technology is generally best when consistently inspecting the same product day in day out, like a chocolate bar. However, many food manufacturers today have more expansive ranges, which limits their use.

Multi-frequency systems, which Fortress began developing around 15 years ago, perform well on a range of products passing down the same production line. However, the sensitivity and performance may be compromised, increasing the risk of metal contaminants going undetected.

Machine operatives may still have to select the frequency, and this raises the issue of what they are basing their decision on. If it is not tuned in exactly right, like a radio station, they might not select the frequency that delivers perfect clarity and sensitivity.

Simultaneous frequency, deployed in the Interceptor unit, is more sensitive towards product effect, making it ideal for wet products that vary in size and density, like cuts of meat, fish or blocks of cheese.

The company's latest advancement – the Interceptor DF – takes this one step further, introducing a multi-orientation, multi-scan food metal detector for inspecting high value, low profile foods. Using multiple coil sets to instantaneously drive the electro-magnetic fields in a different direction, rather than missing a metal contaminant because it has not aligned with a specific field, the Interceptor DF looks for signals over a broad spectrum, from multiple angles.

Fortress most recently extended its range to offer a fail-safe x-ray/metal detector combination system, reducing the risk of any contaminant getting through the safety net, in addition to combination checkweigher and inspection systems.

A soup of global rules

Changes to food safety concepts throughout the world are largely driven by US legislation, with most countries now converging towards the FSMA standards, including British Retail Consortium.

Today, food imports has become a big focus with the European Union looking to reach a mutually compatible arrangement with the US FDA.

Just as history has shaped and enshrined today's food safety rules, today's emphasis on sustainability, health and authenticity is pushing product integrity into a whole new sphere. No longer just confined to western economies, with the launch of the Feed the Future Innovation Lab for Food Safety initiative it is anticipated that awareness will increase in emerging economies, ensuring global food security becomes truly global. Through the sharing of best practice to building new food policy frameworks, food producers will be able to scale up their export businesses and reach higher-value markets, benefiting their local communities in addition to feeding the world's growing population.

Using multi-frequency technology, Fortress developed and launched the new Interceptor range to help combat product and orientation effect.

What is clear is food safety is a shared responsibility. The rules and audits add an additional layer of protection. But by continuing to work closely together, food manufacturers, machinery suppliers, production staff, retailers and consumers can shape how modern businesses cater to future food safety demands. ■