

The Evolution of FSMA and Track-and-Trace Technology

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The genesis of the Food Safety Modernization Act ([FSMA](#) [1]) was centered on a forced evolution of the food chain from a reactive model to a proactive model. This cornerstone food legislation has propelled the food industry forward through the extension of track-and-trace requirements and regulations to the integrated chain, not just the separated parts, to ensure a more holistic approach to the supply chain. And while the food chain has rapidly progressed — driven by compliance — to meet the more stringent, integrated track-and-trace standards, there is still ample room for improvement.

To understand how far we have come in food safety with specific attention to the cold chain, we must first look back. Before the FSMA, U.S.-based food systems and governance were aligned with the out-of-date agricultural models of the 1800s and 1900s. The focus of the system hinged on a domestic, subsistence farming model versus an agricultural model based on a global supply system, which we have today. Additionally, while track and trace existed pre-FSMA, its implementation lacked maturity as well as integration. Therefore, the absence of a uniform method of supply lifecycle recordkeeping persisted with risks in food safety that extended to both customers and businesses. And, with weaker compliance requirements and penalties during the pre-FSMA era, there was no business incentive driving companies to step up to the compliance plate. Enter the FSMA — a world of standards, compliance and food safety was born.

The FSMA established a bite behind the bark of Hazard Analysis and Critical Control

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Points ([HACCP](#) [2]) for the cold chain. This bite comes from newly endowed powers afforded by the FSMA to the [Food and Drug Administration](#) [3] to heavily penalize the non-compliant. Whereas non-compliance previously was a risk worth taking when weighed against the cost of cold chain modification, now the cost and business impact of non-compliance is far greater. Should the FDA discover an error, they have the power to shut down the entire operation.

Quality testing standards also are higher, more stringent and applied more uniformly throughout the cold chain. Visual and pallet sensors monitor product temperature for compliance at every step of the chain. For example, should a singular pallet in a freight rise above that critical control point, that information is electronically transmitted for monitoring purposes. In other words, when a container leaves a dock from a non-U.S. port with product en route to a U.S.-based end point, the transportation handoff from the distributor to shipper does not present an opportunity for a lapse in standards. Quite the opposite, in fact. And because the tools are there to track product throughout the cold chain, it is unequivocally expected.

FSMA-era regulations also refocus more antiquated compliance measures to be scalable in an increasingly global-driven economy and agricultural model. Freight entering the U.S. from anywhere in the world still must maintain U.S. standards based on container end point. Proof of quality is required at each checkpoint in the cold chain to ensure there has been no disruption and that the product has been tested and approved in a manner compliant with U.S. standards. At its core, the current FSMA guidelines have empowered the FDA to ensure that track and trace elevates the quality of food throughout the entire course of the cold chain. Compliance now mitigates any risk that critical control points could be compromised in the course of transit at the container and pallet level, and this has resulted in a higher standard of product.

As noted, much already has been accomplished with ensuring the safety and effectiveness of importing and exporting product within the cold chain, but there is always room for improvement. Specifically, the continued holistic integration of track and trace into the cold chain will only elevate efficiencies, promote food safety and provide profit opportunities or incentives for participating enterprises. For example, say a customer buys a frozen food box meal at the grocery store and spinach is one of the sides in that meal. Have you ever thought about the journey of that side of spinach? With track and trace integration, we can track the exact spot on the farm plot where that seed was planted, through plant growth and then product transport from the container, down through the pallet and into the little plastic square in a box in the grocery store where the customer picks it up.

What's amazing about this capability is that should anything compromise the quality of the spinach, we can drill down to the specific pallets that may be compromised and still save product, or adjust shipment strategy to retailers who will accept the product. Previously, without this technology or mandated track and trace, an entire container may have to be discarded in consideration of HACCP. Now product and profit can be conserved hand in hand.

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In some ways, the FSMA has shined a light on the fact that the goals of food safety and product profit actually deeply align. In the future, organizations that recognize intuitive alignment and adjust their systems accordingly through greater proactivity will see greater efficiencies and less waste. This proactivity might require investments in the short term, but in the long run, will influence the overall profitability and growth potential of the business since shipping bad product has never been riskier. Additionally, this type of holistic track and trace integration gives companies time to remedy any issues that may arise in shipment. For example, should a cold container rise above a critical control point at any point during shipment and the responsible company sees that issue in real time, they still can meet customer demand with a logistical supply chain move by deploying shipment of product from another port nearby. By proactively responding to these ongoing and oft-occurring issues in the cold chain, the company still meets customer demand and remains FSMA-compliant, ensuring a more profitable result by preserving the margin of opportunity with the customer.

With the globalization of the food chain, the current framework of track and trace ensures that all organizations in the supply chain continue modernizing to deliver product up to expected U.S. consumer standards. When we look at the cold chain, it is crucial that we examine efficiencies with a globally integrated view and ensure we can make decisions in the supply chain before we incur costs or compromise product supply. With the holistic framework, we can remove costs in the supply chain, ensure product safety and, ultimately, drive business growth.

Selecting a trusted partner, like [itelligence](#) [4], enables organization to implement solutions, such as [it.cpg](#) [5], that offer cross-functional integration in a single solution. Increasingly deeper supply chain integrations will only continue to fuel innovation, meaning that as consumers continue to care more about where their food comes from and how it was made, organizations that place a high importance on thorough supply chain integration, compliance, and track and trace will maintain the competitive edge through both product movement and branding.

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