CSCMP hottopics

Leveraging GS1 Standards and 2D Barcodes to Ensure Food Safety Compliance and Consumer Transparency

By Ryan Richard, Vice President of Community Engagement, GS1 US

CSCMP

Educating and Connecting the World's Supply Chain Professionals.™

In an era where food products are distributed globally, the vital need to maintain food safety is increasingly complex. A collaborative effort involving all stakeholders in the supply chain – from growers to retailers – is crucial to ensure the integrity of the food supply. The U.S. Food and Drug Administration (FDA) plays a pivotal role in governing the movement, production, sale, and service of food products, with a primary focus on preventing and mitigating the occurrence of foodborne illnesses. Last November, the FDA introduced the **Food Traceability Final Rule** (Final Rule), an essential step in enhancing traceability for high-risk food categories historically implicated in outbreaks.

HIGH-RISK FOODS AND THE FINAL RULE

The FDA's **Food Traceability List** (FTL) highlights certain high-risk food categories, including soft cheeses, fresh/cut produce, shell eggs and nut butters, seafood and ready-to-eat deli salads, among others. Foods on this list (as well as foods that contain them as ingredients) are subject to new requirements spelled out in the Final Rule, which implements Section 204(d) of the Food Safety Modernization Act (FSMA) and is a key component of the agency's New Era of Smarter Food Safety Blueprint. Under this rule, companies that manufacture, pack, process, or hold FTL foods are required to maintain specific information (key data elements or KDEs) for certain critical tracking events (CTEs) occurring within the supply chain.

The information required varies depending on the type of supply chain activities a company performs, from harvesting or production of food through processing, distribution, and receipt at retail or other points of service. This additional data is essential for swift tracking and tracing in the event of recalls or investigations. Supply chain partners are required to maintain the data in their systems for two years and provide it to the FDA within 24 hours upon request in the event of an investigation or outbreak. The FDA set a compliance deadline of January 20, 2026.

THE ROLE OF GS1 STANDARDS

Numerous organizations who are part of the GS1 US retail grocery and foodservice industry initiatives, including leading manufacturers, distributors, retailers, foodservice operators, solution providers, and industry associations have worked together to analyze business processes and requirements and consider how GS1 Standards can be applied to support requirements outlined in the Final Rule. The result of this effort is summarized in a new guideline published by GS1 US, "**Application of GS1 System of Standards to Support FSMA 204**." The guideline defines the best practices for product and location identification, structured product descriptions, and the recording of common industry-defined events to support the additional traceability requirements.

Until now, each company's chain of custody record-keeping requirement has been characterized as "one up, one down," per the 2002 Public Health Security and Bioterrorism Preparedness and Response Act (Bioterrorism Act). The Final Rule means that companies will need to integrate data records from other trading partners with their own. Interoperability is going to be essential for the records to be coherently transmitted and catalogued. Leveraging GS1 Standards (already widely used with UPC codes, Global Trade Item Numbers (GTINs) and GS1-128 barcodes) provides consistency and interoperability across different environments and systems while meeting a wide variety of business needs.

CSCMP hottopics

Leading companies in the food industry are championing the adoption of GS1 Standards to facilitate automated information exchange between trading partners. This adoption not only increases supply chain visibility but also enables quicker, more efficient responses to unforeseen challenges. The ability to share product information seamlessly across the supply chain is pivotal for improving traceability, meeting the Final Rule's data requirements, and minimizing the necessity, scope and economic impact of food recalls – in addition to the public health risks arising from distribution of contaminated food products.

Key GS1 Standards such as GTINs and Global Location Numbers (GLNs) for product and location identification, respectively, are instrumental in this endeavor. Electronic Product Code Information Services (EPCIS), a standard for recording product status during transit (e.g., location, temperature, etc.), aligns with the FDA's vision for electronically sharing product and event data throughout the food production and distribution process. Collectively, these GS1 Standards lay the groundwork for identifying, capturing, and sharing KDEs and CTEs, as mandated by the Final Rule. Even for foods that are not on the Traceability List – and for non-food products – these practices will enable greater efficiencies afforded by increased supply chain visibility and transparency.

ENHANCING CONSUMER TRANSPARENCY

Beyond regulatory compliance, forward-looking companies are harnessing the power of digital technology to meet consumers' increasing demand for detailed product information. Two-dimensional (2D) barcodes such as the GS1 DataMatrix offer much greater data capacity compared to traditional linear (UPC) barcodes. The retail community is committed to implementing and scanning 2D barcodes at the point of sale within the next four years in the "**Sunrise 2027**" initiative led by GS1 US.

The expanded data capacity of 2D barcodes enables companies to include crucial information such as expiration dates, batch and lot numbers, GTINs, in keeping with regulatory requirements. Moreover, it opens doors for brands to establish digital connections with consumers, providing transparency to communicate product attributes such as ingredient sourcing, processing conditions, additives, allergens, and environmental impact. These web-enabled 2D barcodes can be easily scanned with any smart device, granting consumers access to a wealth of information as provided by the brand owner, such as nutritional data, recipes, sourcing, sustainability details, and more. When a recall or other safety issue occurs, consumers can find out if the product they've purchased is affected, as well, by scanning the barcode. Many consumers today are scrutinizing such information to make purchasing decisions that are aligned with their values, needs and preferences.

CONCLUSION

Incorporating technologies like 2D barcodes and GS1 Standards into existing processes not only enables adherence to food safety regulations but also empowers companies to adapt to evolving consumer demands. This digital transformation enhances supply chain efficiency while also contributing to the safety of the global food supply. For a deeper understanding of how GS1 Standards enable traceability for enhanced food safety, please visit "**How Do GS1 Standards Enable Traceability for Enhanced Food Safety?**"

CSCMP

Educating and Connecting the World's Supply Chain Professionals.™