The Global Language of Business

GS1 US Spreadsheet Recommendations for FSMA Rule 204 Addendum

Release 2.0, July 1 2026



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The GS1 US Retail Grocery Initiative represents a broad cross section of industry. Today, suppliers, manufacturers, distributors, wholesalers, retailers, academic institutions, regulatory agencies, and trade associations are working together to help address challenges where GS1 Standards can have a positive impact in enhancing data quality, enabling end-to-end supply chain visibility, and improving operational efficiencies.

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Document Summary

Document Item	Current Value
Document Title	GS1 US Spreadsheet Recommendations for FSMA Rule 204 Addendum
Date Last Modified	November 24 2025
Document Description	This document supplements the Retail Grocery and Foodservice Application of GS1 System of Standards to support the FSMA 204 Guideline. It seeks to show how the FSMA 204 Shipping Events and its accompanying master data can be captured and shared in a spreadsheet or CSV file, leveraging GS1 Standards as a common language to enable interoperability and efficiencies between different systems and solution providers.

Log of Changes

Release Number - Date	Changes
Release 1.0 – November 2025	Release/publication
Release 2.0 – July 2026	Specified Traceability Lot Code (TLC) = GTIN+Lot

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1 Background

On November 21, 2022, the United States Food and Drug Administration (FDA) published a Final Rule titled, *Requirements for Additional Traceability Records for Certain Foods*, which is a key component of the FDA's New Era of Smarter Food Safety Blueprint and implements Section 204(d) of the FDA Food Safety Modernization Act (FSMA), which was signed into law in 2011. This rule is commonly referred to as "FSMA 204".

The rule outlines specific Key Data Elements (KDEs) of Critical Tracking Events (CTEs) that need to be recorded and shared with the U.S. FDA, upon request, and at minimum, through a sortable electronic spreadsheet. Except for the **Shipping CTE** and select upstream activities, the rule does not require companies to share records with their trading partners, only to keep records in case the U.S. FDA requests them. The rule does not specify the use of data carriers (e.g., barcodes or RFID tags) or additional formats beyond a sortable spreadsheet for the exchange of data with the U.S. FDA or between trading partners. The rule includes several exceptions for specific foods or entities where records are not required.

In response to this, members of the food industry in the US are preparing their systems and business processes to meet the requirements. Specifically, many food supply chain stakeholders have been implementing or exploring the benefits of using the following GS1 Standards and business solutions:

- Global Trade Item Number® (GTIN®) for unique product identification
- Global Location Number (GLN) for unique party and location identification
- Global Data Synchronization Network™ (GDSN®) and Global Data Model (GDM) for consistent descriptions of products
- Electronic Data Interchange (EDI) and Electronic Product Code Information Services (EPCIS) for structured data capture and sharing internally and among trading partners.

Leveraging GS1 Standards provides consistency and interoperability across different environments and systems while meeting a wide variety of business needs.

For more information and tools on leveraging GS1 Standards to help meet FSMA 204 requirements please visit: *https://gs1us.org/fsma*.

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2 Introduction

This document supplements the *Retail Grocery and Foodservice Application of GS1 System of Standards to Support FSMA 204 Guideline* and provides guidance on how to structure the data in a CSV file or spreadsheet to help meet the Shipping Critical Tracking Event (CTE) requirements of FSMA 204. It seeks to increase consistency and ease of implementation by outlining and defining the basic data elements and formats that must be shared between solution providers and trading partners as outlined by the U.S. FDA in *"§ 1.1340 "*What records must I keep and provide when I ship a food on the Food Traceability List?". Solution providers are welcome to add more information to their data sharing structures The CSV/spreadsheet file format shown in this document is based on the *EPCIS example developed by GS1 US*. EPCIS (Electronic Product Code Information Services) is the flagship data capture and sharing standard from GS1 specifically developed for enabling full supply chain visibility both inside organizations and between trading partners. It does so by providing a framework to model events that occur in supply chains as they truly happen, including "what" supply chain objects are involved, "where" and "when" the events take place, and "why" the events occurred, such as the business process, related transaction documents, and more. However, even when using a spreadsheet or CSV file, companies can use best practice and structure the data using a common language that can be easily understood and ingested by other systems and turned into EPCIS as needed.

In addition to the spreadsheet column names, an appendix has been included with the GS1 Application identifiers used to create barcodes for case and pallet labels for reference. To enable interoperability, the CSV/spreadsheet file data attributes have been aligned with the attributes or application identifiers that can be encoded in GS1 barcodes. A link to the GS1 Application Identifier list is included, which provides specific character usage guidance. This is especially critical for TLC and Product GTIN since they are the primary links between critical tracking events.

- Note 1: A Pallet SSCC and Date Code have been included as a recommended best practice, but not a required data element for FSMA 204. Given the critical role SSCC plays in the supply chain, the industry has agreed it is important to include.
- Note 2: Industry has agreed that GS1 identification keys should be used as best practice to minimize the number of data elements and maximize the global utility of this guidance. We recognize that this requires adoption of GTINs, GLNs, and SSCCs. However, without internationally recognized standards and globally unique identifiers, there is no way to assure the ability to share data between U.S. and international solution providers. Given that well over half of the 235,587 FDA registered food facilities are overseas and span more than 200 countries, only GS1 has the ability to provide identifiers and localized guidance to all of these food facilities. Once a GS1 Identification key has been shared with trading partners, it should not be changed.

***Note**: As with all GS1 Standards and solutions, this guideline is voluntary, not mandatory. It should be noted that the use of the words "must" and "require" throughout this document relate exclusively to technical recommendations for the proper application of the standards to support the integrity of your implementation.*

Each company is individually responsible for meeting all statutory and/or regulatory requirements for their company and their products. Consult with your company's legal counsel or compliance team (regulatory or quality) for more specific information about current statutory and regulatory requirements applicable to your company and products. Nothing herein should be construed as constituting or implying an agreement among foodservice and/or retail grocery companies to adopt or implement GS1 Standards.

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3 Shipping CTE

U.S. FDA requires trading partners for the Shipping critical tracking event or CTE to exchange key data elements or KDEs. Industry has defined as best practice that GS1 EDI transaction dataset[1], Advance Shipping Notice (ASN) or EPCIS be utilized to meet this requirement. However, companies can also exchange this information in a spreadsheet or CSV file format as described below.

Table 3-1 Shipping KDE - Spreadsheet Structure

FSMA 204 KDE	Spreadsheet Column Name	Spreadsheet Data Format	Example
Traceability Lot Code (TLC) for the Food. *Industry Endorsed – GTIN+batch.lot	TLC = GTIN + Lot	N14+X..20	10614141000019+ABC1234
Optional: Product Date - not a FSMA 204 KDE	Production_Date Packaging_Date Best_Before_Date Sell_By_Date Expiration_Date First_Freeze_Date Harvest_Date	N6 (YYMMDD)	250901
Quantity of the Food	Quantity	N6	25
Unit of Measure of the Food	UOM	X..3	Count, Each, Lb, etc
Optional: Pallet ID - not a FSMA 204 KDE	Pallet_SSCC	N18	006141415874587485
*Product Description for the Food	Product_GTIN*	N14	10614141000019
*Ship From Location Description	Source_GLN*	N13	0614141012756
*Immediate Subsequent Recipient Location Description	Destination_GLN*	N13	0614141013005
Date You Shipped the Food	Ship_Date	N6 (YYMMDD)	250114
*Location Description for the TLC Source (or Reference)	TLC_Source_Ref_GLN**	N13	0614141012756
Location Description for the TLC Source (or Reference)	TLC_Source_Ref_URL**	X..70	https://id.jluhu.com
Reference Document(s) Type(s)	Ref_Doc_Type	X..30	PO
Reference Document(s) Number(s)	Ref_Doc_Number	X..30	850-100037169

Sources for Shipping KDEs data structure: *GS1 US EPCIS Recommendations for FSMA 204 CTEs* and *Mapping CTEs and KDEs to GS1 Standards*

***Note**:* *Product Description and *Location Description information must be provided as master data with shipping record unless otherwise provided (separate spreadsheets provided for sharing these KDEs).

[1] All references to ASN or EDI 856 refer to X12's Supply Chain Transaction Standards. For more information refer to x12.org/products/transaction-sets

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4 Product Description KDEs

As best practice, a GTIN in conjunction with standardized attributes describing the food can fulfill the product description KDEs of the Final Rule. See *Final Rule* for detailed FDA definition. Companies following GS1 Standards commonly turn to the *GDSN* and *GS1 US Data Hub* to serve as reliable data sharing methods.

***Note**:* This section is only intended to illustrate mappings between the Final Rule and attributes from applicable GS1 Standards. It is not intended to provide all the information necessary to implement these standards but can serve as a foundation for discussion between compliance teams and teams responsible for product information.

Table 4-1 Product Description KDEs - Spreadsheet Structure

FSMA 204 KDE	Spreadsheet Column Name	Spreadsheet Data Format	Example
Product Identifier (GTIN tied to Shipping CTE)	Product_GTIN	N14	10614141000019
Product Alternate Reference	SKU	X..30	ABC111
Pack Style	Packaging_Level	X..30	Each, Case as Each, Inner Pack, Case, Display Shipper, Mixed Case, Pallet, Mixed Pallet
Product Description: Name (Brand, Commodity/Variety), Pack Size, Pack Style, or Seafood Species and/or Acceptable Market Name	Description	X..70	XY Farms, Tomato, Grape, 1 Pint, Clamshell
Product Description 1 Language	Desc_1_Language	X2	En
Brand Name (if applicable)	Brand_Name		
Pack Size (optional)	Height	N..8 (up to 3 decimal places)	6.00
Pack Size (optional)	Width	N..8 (up to 3 decimal places)	10.00
Pack Size (optional)	Depth	N..8 (up to 3 decimal places)	16.00
Pack Size (optional)	Dimension_Measure	Text (X..20)	Inches, Feet, Millimeters, Centimeters, Meters
Pack Size (optional)	Gross_Weight	N..8 (up to 3 decimal places)	10.00
Pack Size (optional)	Net_Weight	N..8 (up to 3 decimal places)	9.5
Pack Size (optional)	Weight_Measure	X..30	Ounces, Pounds, Milligrams, Grams, Kilograms, Short Ton
Product Description Reference for Contents (optional)	Child_GTINs	N14	00850079234000
Pack Size	Quantity	N..8	12
Commodity/Variety (if applicable)	Global_Product_Classification	N8	10006163

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5 Location Description KDEs

The *Location Description* KDEs in the Final Rule can be fulfilled by using a GLN to identify a physical location and accompanying standardized attributes describing the location. See *Final Rule* for detailed definition.

When the U.S. FDA asks for records from a company subject to the rule, the location description KDEs could be defined by one of their trading partners since the locations a product is being shipped to, received from, or the traceability lot code source will likely each be a different company for many CTEs recorded in the supply chain.

Exchanging data describing the physical locations between trading partners has been a routine part of business, but utilizing a channel that follows a standard convention is still rather novel. This section will illustrate mappings between the Location Description KDEs defined by the U.S. FDA in the Final Rule and attributes available in GS1 US Data Hub Location. It is not intended to provide all the information necessary to implement the standards but can serve as a foundation for discussion between compliance teams and teams responsible for location information.

For more information on using GLNs and GS1 US Data Hub Location please visit: *GS1 US GLN Recommendations for FSMA 204*

Table 5-1 Location Description KDEs - Spreadsheet Structure

FSMA 204 KDE	Spreadsheet Column Name	Spreadsheet Data Format	Example
Location Identifier (GLN tied to Shipping CTE)	Location_GLN*	N13	0614141012756
Business Name	Company_Name	X..70	ABC Restaurant #001
Country	Country_Code	X2	US
Physical Location Address	Address_Line_1	X..70	300 Charles Ewing Boulevard
Physical Location Address	Address_Line_2	X..70	Ste 200
Physical Location Address	Address_Line_3	X..70	
City	Fixed_Physical_City	X..70	Ewing
State	Fixed_Physical_State/Province /Region	X..30	US-NJ
Zip	Postal_Code	X..20	08628-1234
Geo-Coordinates	Geo_Coordinates_Latitude	N..10 (up to 7 decimal places)	35.7796348
Geo-Coordinates	Geo_Coordinates_Longitude	N..10 (up to 7 decimal places)	-78.6382283
Phone Number	TelePhone_Number	N10	9191112222

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6 Appendix – Application Identifiers

GS1 Application Identifiers (AIs) are a finite set of specialized identifiers encoded within barcodes to indicate the type of data represented in the various barcode segments. Each AI is a two-, three-, or four-digit numeric code. When rendered in human-readable form, the AI is usually shown in parentheses. However, the parentheses are not part of the barcode's encoded data. Each data element in a barcode is preceded by its AI. For example, the AI for GTIN is 01. The table below shows the most common AIs used for traceability in food distribution. The full list of AIs can be found in section 3.1 of the *GS1 General Specifications*. There are also category-specific date requirements based on specific product needs. For sector specific AI information, refer to section 3 of the *North American Industry Guidance for Standard Case Code Labeling*.

Table 6-1 Shipping KDE Application Identifiers

FSMA 204 KDE	GS1 Application Identifier	Barcode Data Format	Example
Traceability Lot Code (TLC) for the Food	(01) GTIN + (10) Batch or Lot Number	N14+X..20	10614141000019+ABC 1234
Optional: Product Date - not a FSMA 204 KDE	(11) Production date (13) Packaging date (15) Best Before date (16) Sell By Date (17) Expiration Date (7006) First Freeze Date (7007) Harvest Date	N6 (YYMMDD) Note: include "00" as DD if actual day is not available	250901
Quantity of the Food	(37) Count of trade items or trade item pieces contained in a logistic unit (30) Variable count of items (310*) Variable net weight KG i (320*) Variable net weight LB	N..8 N..8 N6	25
Unit of Measure of the Food	N/A	-	-
Optional: Pallet ID - not a FSMA 204 KDE	(00) Serial Shipping Container Code (SSCC)	N18	006141415874587485
*Product Description for the Food	(01) Global Trade Item Number (02) Identification of trade items contained in a logistic unit	N14	10614141000019
*Ship From Location Description	(412) Purchased From GLN	N13	0614141012756
*Immediate Subsequent Recipient Location Description	(410) Ship To / Deliver To GLN	N13	0614141013005
Date You Shipped the Food	N/A	-	-
*Location Description for the TLC Source (or Reference)	(416) Production Location GLN	N13	0614141012756
Location Description for the TLC Source (or Reference)	(8200) Extended packaging URL	X..70	*https://www.gs1.org/services/verified-by-gs1*
Reference Document(s) Type(s)	(400) Customer's purchase order number	X..30	PO
Reference Document(s) Number(s)	(400) Customer Purchase Order	X..30	850-100037169

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