



CONTENTS

1	INTRODUCTION	5
1.1	DOCUMENT INFORMATION	5
1.2	LOG OF CHANGES IN R2.0	5
1.3	CONTRIBUTORS	5
2	PURPOSE OF THIS DOCUMENT	6
3	WHAT ARE THE CRITICAL TRACKING EVENTS?	7
3.1	TRANSFORMATION-TYPE EVENTS	8
3.2	TRANSPORTATION-TYPE EVENTS	9
3.3	DEPLETION-TYPE EVENTS	9
4	APPLICATION OF CRITICAL TRACKING EVENTS TO THE MEAT & POULTRY SUPPLY CHAIN	10
4.1	PRIORITY 1: MARK PRODUCTS WITH AND CAPTURE GLOBALLY UNIQUE PRODUCT IDENTIFICATION	10
4.2	PRIORITY 2: FOCUS CAPTURE EFFORTS ON CONSUMPTION & PRODUCT TRANSFORMATION EVENTS	10
5	USING CRITICAL TRACKING EVENTS TO DETERMINE SOURCES OF FOODBORNE ILLNESS OUTBREAKS	13
6	WHAT ARE KEY DATA ELEMENTS?	15
6.1	WHAT ARE THE KEY DATA ELEMENTS FOR CRITICAL TRACKING EVENTS?	15
6.2	EVENT TYPE	16
6.3	EVENT OWNER	16
6.4	EVENT DATE AND TIME	16
6.5	EVENT LOCATION	17
6.6	ITEM IDENTIFICATION	17
6.7	BATCH/LOT/SERIAL NUMBER	18
6.8	QUANTITY	18
6.9	UNIT OF MEASURE	18
6.10	ACTIVITY ID	19
6.11	BATCH/LOT RELEVANT DATE	19
6.12	SUPPLIER IDENTITY	20
6.13	TRADING PARTNER LOCATION	20
7	GS1 STANDARDS AS A SOURCE OF KEY DATA ELEMENTS	20
7.1	GLOBAL TRADE ITEM NUMBER AS AN ITEM ID REFERENCE	21
7.2	GS1 APPLICATION IDENTIFIERS AS A BATCH/LOT/CASE SERIAL NUMBER REFERENCE	22
7.3	GLOBAL LOCATION NUMBERS AS AN EVENT OWNER, EVENT LOCATION, AND SHIP TO/FROM LOCATION REFERENCE	24
8	EXAMPLES OF CRITICAL TRACKING EVENTS MANAGED IN THE MEAT & POULTRY SUPPLY CHAIN	25
8.1	MANAGEMENT OF THE TRANSFORMATION INPUT EVENT (T1)	25
8.2	MANAGEMENT OF THE OUTPUT PRODUCT TRANSFORMATION EVENT (T2)	30
8.3	MANAGEMENT OF THE CONSUMPTION EVENT	32
8.4	CONSUMPTION EVENT WHEN A CONSUMER PURCHASES A PACKAGED PRODUCT MARKED WITH A GS1 DATABAR	34
8.5	MANAGEMENT OF THE SHIPPING EVENT	38
8.6	MANAGEMENT OF THE RECEIVING EVENT	42



8.7	MANAGEMENT OF THE DISPOSAL EVENT.....	48
9	IMPLEMENTATION FACTORS FOR DISTRIBUTORS	50
10	IMPLEMENTATION FACTORS FOR FOODSERVICE OPERATORS.....	52
11	IMPLEMENTATION FACTORS FOR GROCERY RETAILERS.....	54
12	POTENTIAL USE OF EDI MESSAGES FOR REPORTING CRITICAL TRACKING EVENT DATA.....	56
13	ADDITIONAL RESOURCES.....	59
14	APPENDIX A: GLOSSARY	60
15	APPENDIX B: GS1 APPLICATION IDENTIFIERS RELEVANT FOR THE MEAT AND POULTRY SUPPLY CHAIN	63
16	APPENDIX C: LIST OF TABLES AND FIGURES	65



ABOUT GS1

GS1® is a neutral, not-for-profit, global organization that develops and maintains the most widely-used supply chain standards system in the world. GS1 Standards improve the efficiency, safety, and visibility of supply chains across multiple sectors. With local Member Organizations in over 110 countries, GS1 engages with communities of trading partners, industry organizations, governments, and technology providers to understand and respond to their business needs through the adoption and implementation of global standards. GS1 is driven by over a million user companies, which execute more than six billion transactions daily in 150 countries using GS1 Standards.

ABOUT GS1 US

GS1 US, a member of GS1 global, is a not-for-profit information standards organization that facilitates industry collaboration to improve supply chain visibility and efficiency through the use of GS1 Standards, the most widely used supply chain standards system in the world. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading-partner collaboration that optimizes their supply chains, drives cost performance and revenue growth while also enabling regulatory compliance. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®).

1 INTRODUCTION

1.1 DOCUMENT INFORMATION

DOCUMENT ITEM	CURRENT VALUE
DOCUMENT TITLE	A Model for the Adoption of Critical Tracking Events in the Meat and Poultry Supply Chain
DATE LAST MODIFIED	May 29, 2014
STATUS	Final
DOCUMENT DESCRIPTION	This document serves as a guide to adopting the emerging critical tracking event methodology for food product traceability in the meat and poultry supply chain.

Table A. Document Summary

1.2 LOG OF CHANGES IN R2.0

RELEASE NO.	DATE OF CHANGE	SUMMARY OF CHANGE
R2.0	05/29/2014	Brand update as a result of mpXML transition to GS1 US Added disclaimer information Updated copyright and trademarks

Table B. Log of Changes

1.3 CONTRIBUTORS

NAME	ORGANIZATION
KRISTIN ANDERSEN	Wegmans
DOUGLAS BAILEY, LEAD FACILITATOR	USDA-AMS
JEFF CHESTER	Food Services of America
MATTHEW GRANLUND	Merchants Foodservice
DICK HAIRSTON	Ben E Keith Co.
SHARON KARLMAN	Reinhart Foodservice
JAN LANGFELDT	Topco Associates LLC
PAUL LOTHIAN, FACILITATOR	Tyson Foods, Inc.
SALLY ROBINSON	Safeway
STEVE ROSENBERG, FACILITATOR	GS1 US
DONNA SONNICHSEN	Farmland
SYNDEE STILES	McLane Foodservice
LELA TRIPP	Tyson Foods, Inc.

Table C. Contributors

GS1 US acknowledges the significant contributions of the organization known as the Meat and Poultry B2B Data Standards Organization (or mpXML) and industry stakeholders listed herein in the development of this document.

The contributors thank Dr. Jennifer McEntire, Leavitt Partners, Dr. Benjamin Miller, Minnesota Department of Agriculture, and Dr. Bruce Welt, University of Florida, for their review of this manuscript and insightful comments that refined and improved its content.

This guide is dedicated to the memory of Lela Tripp, who freely shared her practical knowledge of industry practices and worked tirelessly to improve the efficiency of the meat and poultry supply chain for the benefit of the trade and the public. She will be missed as a friend and colleague by all.

2 PURPOSE OF THIS DOCUMENT

Over the past 5 years, the United States Food and Drug Administration (FDA) sponsored two studies on methods that could improve the ability of the food supply chain to rapidly respond to food illness outbreaks and ensure that implicated products are rapidly and completely removed from the supply chain. The 2009 report by the Institute of Food Technologists¹ (IFT) introduced the concept of “Critical Tracking Events,” which subsequently gained support from industry as a useful approach in meeting the needs of the next-generation supply chain. The second IFT report² issued in 2012 defined the critical tracking events (CTE) to be managed, recommended key data elements (KDE) for each, and recommended that “FDA require firms who manufacture, process, pack, transport, distribute, receive, hold, or import food to identify and maintain CTE- and corresponding KDE-related records, as defined by FDA based on input from the food industry.”

To better understand how a critical tracking event approach to product traceability could be adopted by a fresh food US supply chain, the contributor of this guidance document considered the secondary effects of applying the critical tracking event concept to companies across the meat and poultry supply chain, including packer-suppliers, distributors, retail grocers, and foodservice operators. This guide provides a model for how critical tracking events might be adopted to a fresh food supply chain and provides a reference to enlighten further discussion and evaluation of the concept by industry and government. The guide provides detailed examples of information capture for events common to each supply chain segment and illustrates how critical tracking event methodology could be adapted to fit industry practices such as in-store product transformation and direct-store-delivery of products. Using this model for context, supply chain companies and government can be better equipped to assess the level of investment necessary to revise operating procedures and technology systems to capture CTE information. While this document is intended to promote useful discussions of implementation challenges, supply-chain wide implementation efforts will require additional clarity and prioritization from government and coordination among trading partners.

Although the model specifically evaluates the application of CTEs in the meat and poultry supply chain, the discussion has value for all fresh food sectors, as the meat and poultry, produce, dairy, and seafood sectors share segments of the supply chain and ultimately seek unified traceability solutions that can be effectively implemented for all fresh food products.

¹ McEntire, J. (2009). Traceability (Product Tracing) in Food Systems (Task Order No. 6). Chicago, IL: Institute of Food Technologists.

² McEntire, J., and Bhatt, T. (2012). Pilot Projects for Improving Product Tracing along the Food Supply System – Final Report. Chicago, IL: Institute of Food Technologists.

A companion document, *Traceability for Meat and Poultry U.S. Implementation Guide*, provides a basic explanation of the role of traceability in the supply chain as well as guidance on minimum and best practice traceability practices currently in place across the meat and poultry supply chain. The content in this companion document should be understood and appreciated by the reader before studying the application guidance presented in the following pages.

3 WHAT ARE THE CRITICAL TRACKING EVENTS?

Since the strategic concept of Critical Tracking Events (CTEs) was first offered in 2009, there has been growing consensus of its utility in documenting the path of a product through the supply chain. CTEs are activities in the supply chain that should be documented by the capture of key information for each event in order to accurately trace product movement up or down the supply chain. The IFT report defined CTEs as “those instances where-in product is moved between premises, is transformed, or is determined to be a point where data capture is necessary for effective tracing.”¹ Typically, these events involve a product’s transformation, transportation, or depletion.

To ensure that the chain of traceability is not broken, each trading partner responsible for one of these events should record key information about each event and be prepared to share it with their trading partners or government authorities upon request. The key information to be captured and shared is known as Key Data Elements (KDEs) and will be reviewed in Section 6.

There are six CTEs for parties in the meat and poultry supply chain and these events are organized into three event types as follows:

CRITICAL TRACKING EVENT DEFINITIONS		
TRANSFORMATION-TYPE EVENTS <i>events that typically support internal traceability within the four walls of a supply chain company</i>	TRANSFORMATION (T1) INPUT	An event where one or more materials are used to produce a traceable product that enters the supply chain. (NOTE: Materials used to produce products for immediate consumption by consumers are reported as Consumption events)
	TRANSFORMATION (T2) OUTPUT	An event where a created traceable product is packaged and labeled for entry into the supply chain.
TRANSPORTATION-TYPE EVENTS <i>events that typically support external traceability between supply chain companies</i>	SHIPPING (S) EVENT	An event where traceable product is dispatched from a defined location to another defined location
	RECEIVING (R) EVENT	An event where traceable product is received at a defined location from another defined location.
DEPLETION-TYPE EVENTS <i>events that capture how traceable product is removed from the supply chain</i>	CONSUMPTION (C) EVENT	An event where a traceable product becomes available to consumers (Point-of-Sale or Prepared).
	DISPOSAL (D) EVENT	An event where a traceable product is destroyed or discarded or otherwise handled in a manner that the product can no longer be used as a food ingredient or become available to consumers.

Table D. Critical Tracking Event Definitions

The CTEs most commonly managed by a supply chain segment are summarized below. However, when supply chain companies vary from typical roles, such as a supplier that also sells direct to consumers, those

companies will need to identify and capture KDEs for these events even though they are non-typical for that segment role.

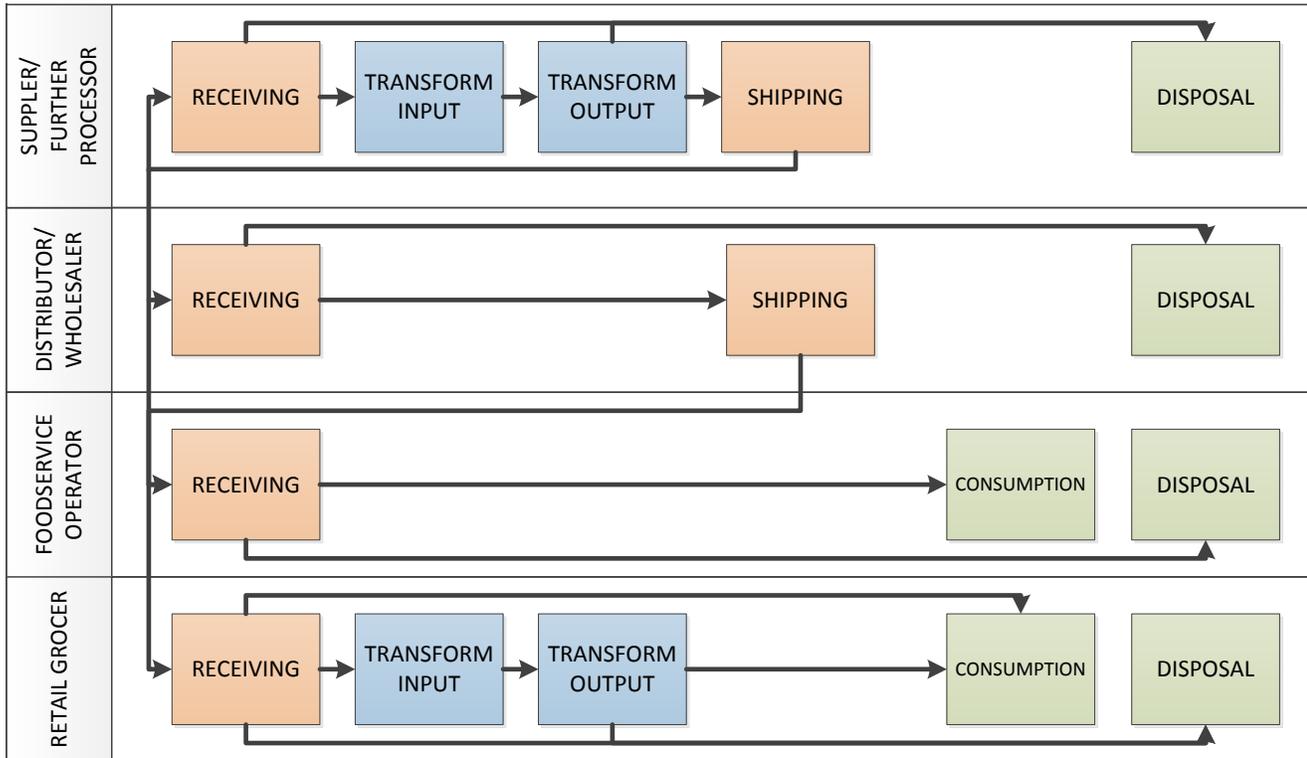


Figure 1. Common Critical Traceability Events by Segment in the Meat and Poultry Supply Chain

3.1 TRANSFORMATION-TYPE EVENTS

Transformation events occur whenever a traceable product is transformed either by: 1) changing the nature of the product itself by mixing different sources of product, adding ingredients, cutting, or cooking; and/or 2) by changing the nature of the product packaging, such as when a company places bulk product in consumer-sized bags for consumer self-service. There are two types of transformation events, Transformation Input (T1) for documenting the identity of input products used in a transformation event and Transformation Output (T2) for documenting the identity of output products from a transformation event.

TRANSFORMATION INPUT (T1) EVENT: The event where one or more materials are used to produce a traceable product that enters the supply chain. Examples of a transformation input event are when raw products or product ingredients from one or more suppliers or sources are processed, combined, or further processed by cutting, cooking, repackaging, etc.. The objective is to capture the supplier, product ID, and production unit designation (e.g., batch/lot number, case serial number, sell-by or use-by date, production date, etc.) of all ingredients used to create a traceable product.

TRANSFORMATION OUTPUT (T2) EVENT: The event where a traceable product is packaged and labeled for entry into the supply chain. Examples of a transformation output event are when a new output product is placed into consumer item containers, inter-packs, and/or cases and all package levels are marked to indicate supplier, product ID, and production unit designation.

NOTE: T1 and T2 events must share a common data element such as a production order that allows related input products to be associated with all corresponding output products to maintain internal traceability.

3.2 TRANSPORTATION-TYPE EVENTS

Transportation events occur whenever a traceable product is physically transferred from one trading partner to another. This product may be used as an ingredient in a later transformation event by the receiving company, or it could be traceable product that is shipped by the receiving company to another trading partner without transformation. In some cases the transportation of a traceable product between two processing or storage facilities of the same company may be documented as a transportation event. Typically, transportation events occur as a Shipping Event followed by a Receiving Event.

SHIPPING EVENT: The event where traceable product is dispatched from a defined location to another defined location. Shipping CTEs are typically followed by a subsequent Receiving event. In some cases, a company could determine that shipping and receiving events should be recorded within their own company, such as when a product batch in an interim state is transferred to another production facility to complete the production process. More typically, this event occurs when a traceable product is sent by truck, rail, or ship from one supply chain company to another supply chain company.

RECEIVING EVENT: The event where traceable product is received at a defined location from another defined location. Receiving CTEs typically occur in response an earlier Shipping event. Typically, this event occurs when a traceable product is received at a location after being transported by truck, rail, or ship between any two supply chain companies but could also include receipt at one physical location after shipment from another physical location under the same ownership.

3.3 DEPLETION-TYPE EVENTS

Depletion events occur when the product leaves the supply chain either by consumption events that make the product available to the ultimate consumer or by disposal events that remove the product from the supply chain in a manner that it can no longer be offered to or used by consumers.

CONSUMPTION EVENT: The event where a traceable product becomes available to consumers. Examples of a consumption event are when a case of delicatessen luncheon meat loafs is opened and one or more loafs are placed in a full-service-display service case at a retail grocery store; a consumer-level tray-package of steak is sold to a consumer at a retail grocery store point-of-sale register; or a case of bulk chicken breast product is opened for use in preparing menu items at a foodservice restaurant.

DISPOSAL EVENT: The event where a traceable product is destroyed or discarded or otherwise handled in a manner that the product can no longer be used as a food ingredient or become available to consumers. An example of a disposal event is when a case of unopened fresh meat product or other traceable product at a foodservice restaurant or grocery retail store reaches its expiration date and is properly discarded.

NOTE: The financial transfer of ownership over traceable product is not a CTE. It may be the cause of a later CTE such as a shipping event or occur simultaneously with a consumption CTE, but the sale or purchase of traceable product by itself is not a critical traceability event. Even in the case of a Consumption event at a retail point of sale, it is the physical transfer and assumed consumption of the product by the consumer that causes the event to be captured and not the financial transfer of ownership to the consumer.

4 APPLICATION OF CRITICAL TRACKING EVENTS TO THE MEAT AND POULTRY SUPPLY CHAIN

Not all events are of equal value in responding to illness outbreaks. When illness outbreaks occur, health officials look for information that shows which products, specific brands, or production units are associated with multiple patients or outbreak locations. This information is provided through the consumption events that show which products, specific brands, or production units were commonly consumed by patients at outbreak locations, or which products have common ingredients used in earlier product transformations.

Therefore, the supply chain can assist health officials in rapidly responding to outbreaks by initially focusing on two priorities:

- 1) Using globally unique product identifiers for consistent product identification by all parties, and
- 2) Capturing consumption and product transformation event data.

4.1 PRIORITY 1: MARK PRODUCTS WITH AND CAPTURE GLOBALLY UNIQUE PRODUCT IDENTIFICATION

Whenever possible, suppliers should assign and identify products by their globally unique product item identification number [i.e., the GS1 Global Trade Item Number[®] (GTIN[®])] when reporting a critical tracking event, and all subsequent event owners should capture and report the same GTIN for events related to that same product. Should that product later be transformed into a new traceable product, the party that transforms it will associate a new GTIN to the new output product, and that number would be reported for all CTEs related to that product until that product is once again transformed or depleted. The reporting of the product's supplier-assigned product item ID by all event owners up and down the supply chain will allow health officials to quickly find all events related to an implicated product. The substitution of supplier stock-keeping unit numbers (SKUs), a company-unique product reference, or the use of purchase order numbers in place of globally unique product identification obscures this thread of visibility as a product moves through the supply chain and should be strongly discouraged. The use of retailer SKUs would even more seriously damage product visibility and should not be acceptable as a product item ID -- these SKUs are not consistently associated with a specific product supplier, since retailer SKUs can be interchangeably sourced from different suppliers.

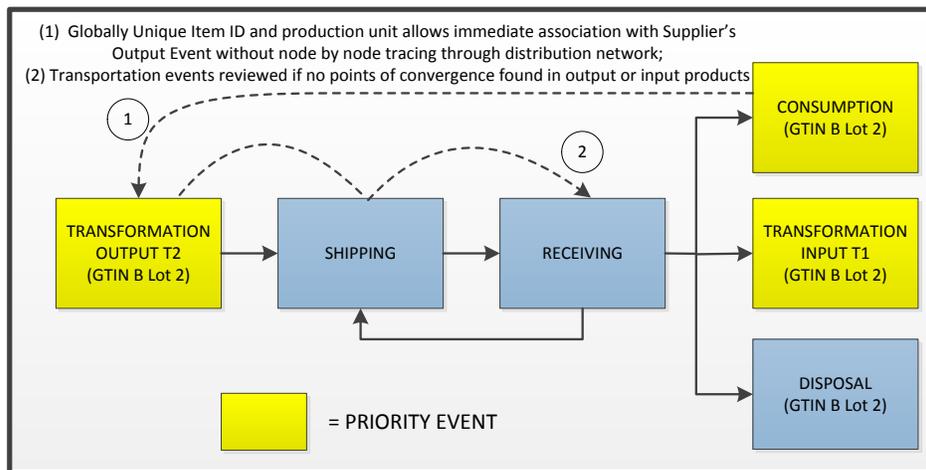
4.2 PRIORITY 2: FOCUS CAPTURE EFFORTS ON CONSUMPTION AND PRODUCT TRANSFORMATION EVENTS

For rapid response to outbreaks, health officials need consumption event information from foodservice or grocery retailer stores associated with the outbreak locations. Accurate consumption event information should reveal which products, brands, or production units were associated with multiple outbreak locations, and if GTINs are captured and reported as the Item ID, health officials will then be able to immediately identify and contact product suppliers and, when available from consumption event data, also use lot numbers or dates marked on consumer packaging to obtain transformation event information for the consumed products.

At a minimum, consumption events should identify the product supplier, that is, the party that last transformed the product, and whenever possible, the item ID and production unit (typically a batch, lot, case serial number or Use-By Date) as well. When a GTIN is used as the product ID, the brand owner will always be known, and that brand owner will either be the party responsible for the last transformation or know who the product supplier is (in the case of private brands). The ability to identify the party that last transformed an implicated

product from data in the consumption event will save health authorities time by not having to traceback product to the product supplier through a node-by-node inspection of transportation events. The use of transportation events to find the product supplier and production facility is secondary when consumption event information provides a GTIN (which indicates the brand owner and product item) and batch/lot/serial number information (which indicates the production facility and time of production). Should no points of convergence be consistent with one or more GTINs and production units for those GTINs or the input products used to create those GTINs, transportation events should be traced forward from the product production facilities to determine if there are points of convergence associated with a storage or transport event. The priority events for traceback are illustrated in the figure below.

GLOBALLY UNIQUE ITEM ID ASSOCIATES CONSUMPTION WITH TRANSFORMATION EVENTS



UP-STREAM TRANSFORMATION EVENTS ASSOCIATE INGREDIENTS WITH CONSUMPTION EVENTS

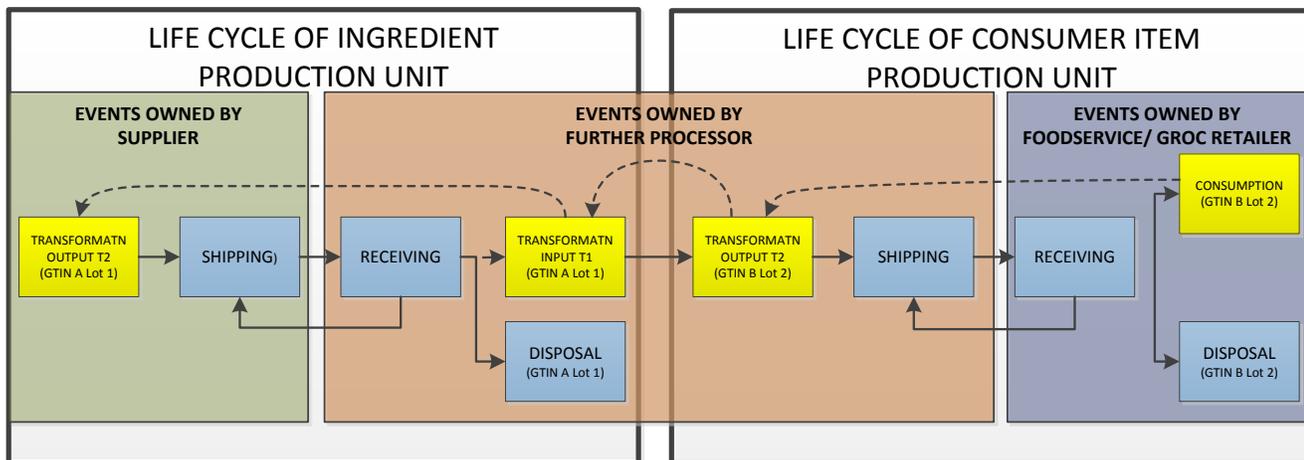


Figure 2. Value of Global Item ID with Production Unit and Capture of Consumption and Transformation Events in Rapid Traceback Response

An overview of the critical tracking events across the meat and poultry supply chain and the typical key data elements associated with each event are shown in the figure below.

Critical Event **CRITICAL TRACKING EVENTS** **Priority Critical Event**

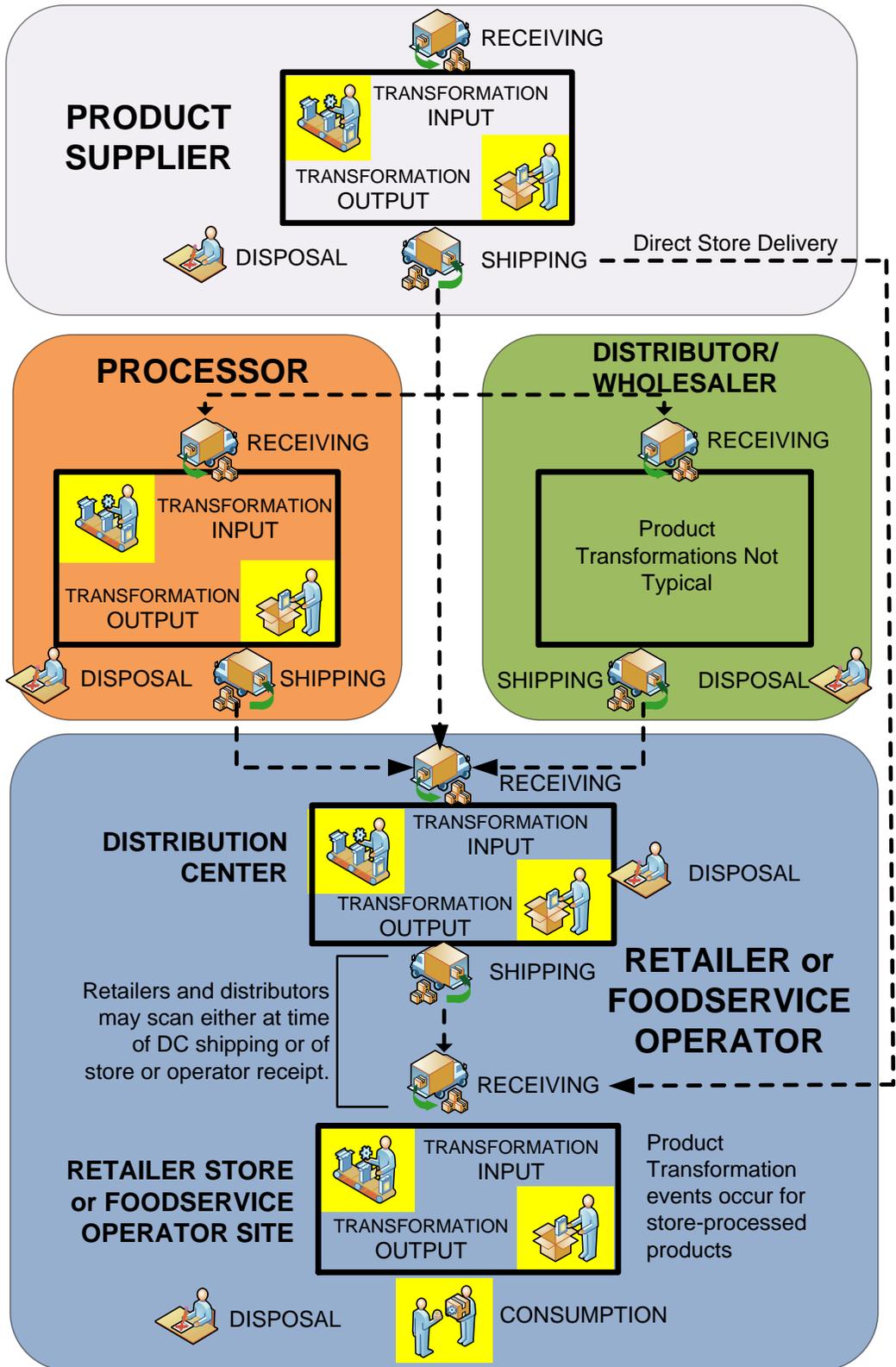


Figure 3. Overview of Critical Tracking Events across the Supply Chain

5 USING CRITICAL TRACKING EVENTS TO DETERMINE SOURCES OF FOODBORNE ILLNESS OUTBREAKS

By consistently capturing consumption and transformation events across the supply chain using globally unique product identification and globally unique location references, health officials should be able to quickly determine the common point of convergence for tracebacks from each illness outbreak location. With consistent capture of consumption events, grocery retail store point-of-sale transactions (ideally with, but even without customer loyalty cards) and foodservice consumption events can be reviewed for common product items and production units. When multiple product items or diverse sets of production units are implicated, product transformation events can be reviewed from each product item supplier to again look for common ingredient items and ingredient production lots. The practical value of globally unique product identification to authorities investigating a food illness outbreak related to fresh blueberries was recently substantiated by Miller, Rigdon, Robinson, Hedberg, and Smith³. Although quick and precise conclusions about implicated products or locations are not assured, the information available from consumption and transformation events will provide a rich foundation for determining which products and locations are or are not likely to be implicated.

For example, if consumption events associated with illness outbreaks involve the same product item and narrow set of production units, the focus will quickly become that supplier and the product production locations. If the supplier's transformation events indicate that input ingredients used elsewhere have not resulted in any illness reports, the production location and down-stream storage and transportation of the implicated production units becomes the focus of further investigation as shown in the figure below.

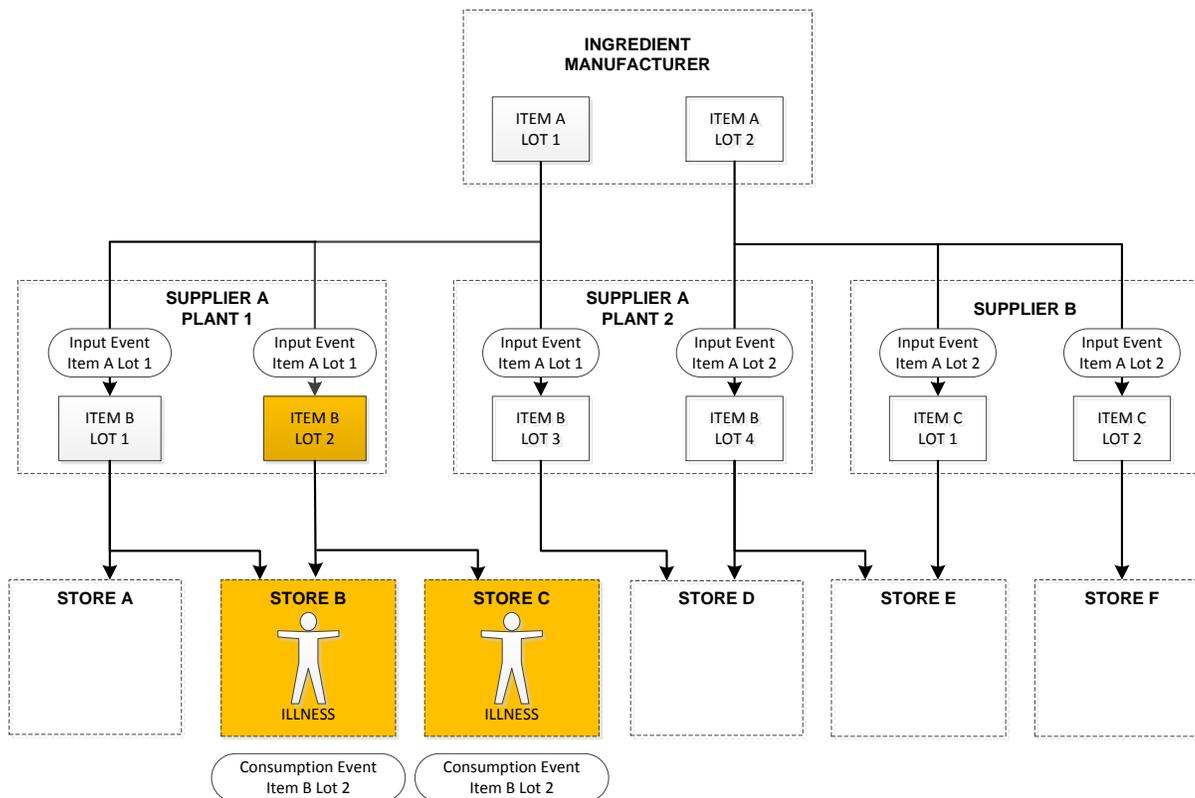


Figure 4. Consumption Events Implicate a Specific Supplier Item and Lot

3 Miller, B. D., Rigdon, C. E., Robinson, T. J., Hedberg, C., and Smith, K. E. (2013). Use of Global Trade Item Numbers in the Investigation of a Salmonella Newport Outbreak Associated with Blueberries in Minnesota, 2010. *Journal of Food Protection*, 76(5), 762-769.

In another example, consumption data can show a variety of suppliers, product items, and production units are associated with illness outbreaks. If supplier transformation events indicate that input ingredients used elsewhere are also associated with illnesses, the ingredient production units and production locations become the focus of further investigation as shown in the figure below.

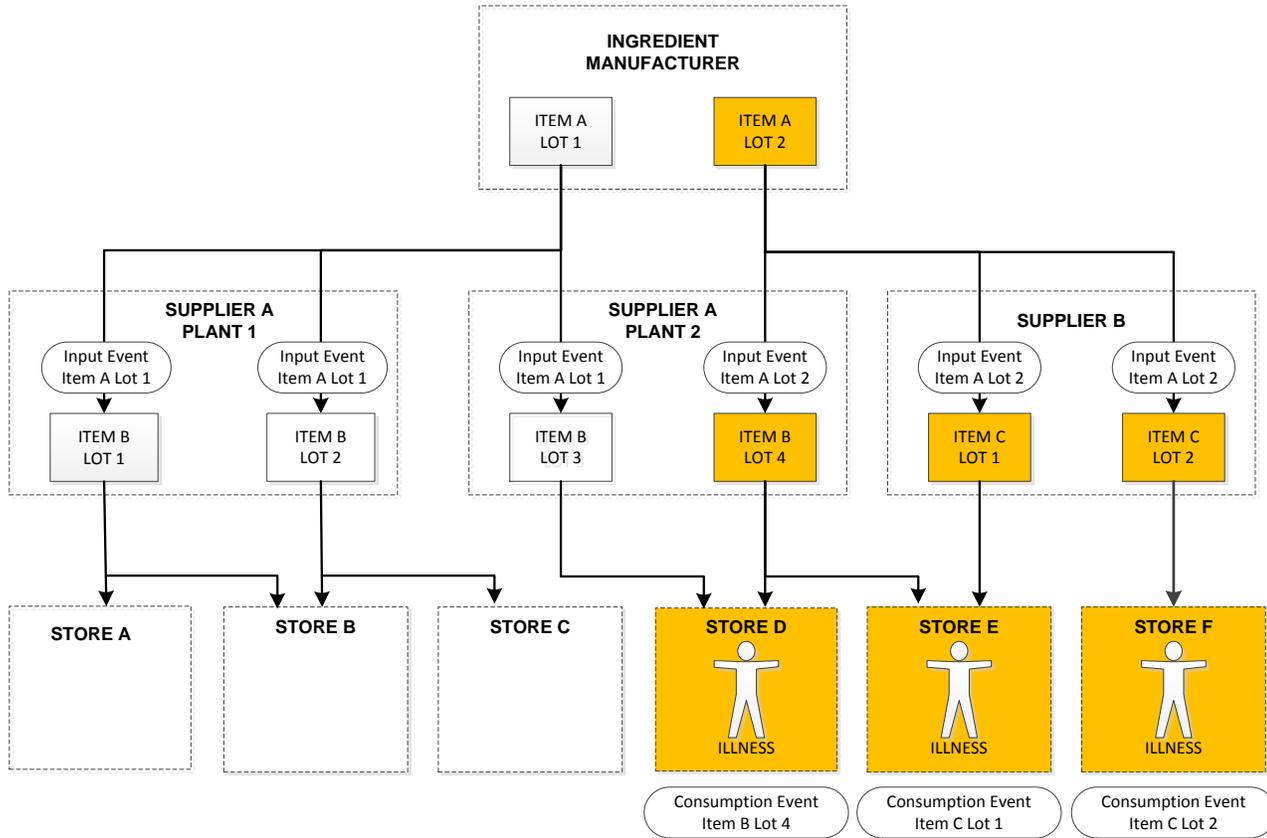


Figure 5. Consumption Events Implicate Ingredient Item and Lot

In summary, “one-up, one-down” product tracing will be less efficient in the source discovery of foodborne illness outbreaks than the capture and use of globally unique product identification numbers and production unit information captured from transformation and consumption events. Consistent use of the GTIN by suppliers and consistent capture of GTIN and production unit information by supply chain companies when reporting consumption events will allow health authorities to immediately identify the parties that last transformed products associated with illness outbreaks without node-by-node tracing back through the distribution network to identify these same suppliers.

Today, consumption event information available to health officials is limited. With the adoption of CTEs, however, foodservice operator and retail grocer consumption event scans of case-end labels would include GTIN and production unit information, and retail point-of-sale consumption scans of the GS1 DataBar® on retail packages would capture the GTIN and production unit information (minimally as a Sell By Date).

The consistent capture of consumption event data that includes globally unique product identification and production unit information will break the dependency on one-up, one-down product tracing and enable a faster and more efficient response capability to illness outbreaks. The accelerated response should, in turn, reduce consumer exposure to food borne illness and minimize withdrawal of sound product to reduce food waste and unwarranted negative brand connotations. Lessons learned could also lead to improved handling processes and more efficient supply chain performance.

6 WHAT ARE KEY DATA ELEMENTS?

Key Data Elements (KDEs) are data elements associated with each critical tracking event and provide:

- 1) Essential information about time and place of the event, the party reporting the event, and the identification of the product involved; and
- 2) Related essential information about the transformation, transportation, or depletion from the supply chain of a traceable product.

In short, the KDEs associated with each Critical Tracking Event should answer the five W's of **Who** performed the activity, **What** product was involved, **When** was it done, **Where** was it done and **Why** the event reported.

6.1 WHAT ARE THE KEY DATA ELEMENTS FOR CRITICAL TRACKING EVENTS?

The KDEs for each CTE managed by the meat and poultry supply chain are as follows:

Key Data Element	Transport		Transformation		Depletion	
	Shipping	Receiving	Input	Output	Consumption	Disposal
Event Type	R	R	R	R	R	R
Event Owner	R	R	R	R	R	R
Date	R	R	R	R	R	R
Time	R	R	R	R	R	R
Event Location	R	R	R	R	R	R
Item ID Type	R	R	R	R	R	R
Item ID	R	R	R	R	R	R
Batch/Lot/Serial#	BP*	BP	R	R	BP	BP
Quantity	R	R	R	R	R	R
Unit of Measure	R	R	R	R	R	R
Batch/Lot Relevant Date	C^	C	C	C^	BP	BP
Activity Type	C	C	R	R		
Activity ID	C	C	R	R		
Supplier Identity	C	C	C	C		
Trading Partner Location	R	R				
R = Required Data						
C = Conditional Data; The need for this data would be determined by business circumstances;						
^ Relevant Date should be reported by Suppliers for Shipping Events and for Transformation Output events.						
BP = Best practice is to capture the batch/lot number for transport and depletion events whenever possible; however, if not feasible, Batch/Lot Relevant date or Activity ID must be provided.						
* Batch/lot/serial numbers should be reported by Suppliers for Shipping events.						

Figure 6. Use of Key Data Elements in Critical Tracking Events

As indicated, some key data elements are more essential than others for understanding the event. Required KDEs are consistently essential when reporting an event, such as event owner, location, and date and time, while other elements are best practice or conditional KDEs, depending on event circumstances or if data values are available for capture. Each of the key data elements is reviewed below in greater detail.

6.2 EVENT TYPE

DEFINED: The Event Type is the value that indicates the nature of the event being reported. Six different event types are defined and one value would be established for each: Transformation Input (T1), Transformational Output (T2), Consumption (C), Depletion (D), Shipping (S), and Receiving (R).

STATUS: Required for each event.

DATA SOURCE: The event type is a static value for each type of event and all companies would use the same Event Type value to designate similar events.

6.3 EVENT OWNER

DEFINED: The Event Owner is the identification of the party that observed and is reporting the event and the party that should be consulted if trading partners or government authorities need more information about the event. The preferred identification is the GS1 Global Location Number (GLN) for that party's corporate or regional office location.

STATUS: Required for each event.

DATA SOURCE: The event owner is a static value for all events reported by a supply chain company. Typically, the value should indicate the organizational unit that should be contacted for additional information about the event, and may be the headquarters or regional office of a large company.

NOTE: A company can be an event owner without being the product owner. For example, a distributor may ship product that belongs to another company, but it is the distributor that causes the shipment to occur and is the only party that has full knowledge of the event and product information that needs to be captured to document the shipping CTE, as the product owner is not on-site at the distributor's shipping location.

6.4 EVENT DATE AND TIME

DEFINED: The Event Date is the calendar day at the event location (formatted as an ISO standard YYYYMMDD) and Event Time is the time formatted in Greenwich Mean Time when an event is completed. When an event activity is performed over an extended period, the ending time should be reported for transformation type events, and the starting time should be reported for depletion type events. Transportation type events should be the approximate time the transportation unit departed or arrived. In the event of a product transformation, it is the date and time when the input product identified is last added to the transformation event or the date and time when the output product identified is last produced.

STATUS: Required for each event.

DATA SOURCE: The Date and Time as observed and reported by the event owner.

6.5 EVENT LOCATION

DEFINED: The Event Location is the facility, plant, warehouse, building, production line, or loading dock door where the event occurs. The preferred identification is the GLN.

STATUS: Required for each event.

DATA SOURCE: The recommended value is the GLN assigned to the location where the event occurs. The same GLN should be consistently used for events that occur in the same location and context, that is, use the same product line GLN for all product transformation events that involve that same product line. Avoid using a plant GLN for some products and the product line GLN for other products when both are produced on the same line.

NOTE: The Event Location GLN (or address) is typically NOT the same as the Event Owner GLN (or address): The event location is typically a production facility or warehouse where the event is observed, and the event owner location is the corporate headquarters or regional office of the party reporting the event.

6.6 ITEM IDENTIFICATION

DEFINED: The Product Item Identification is the reference value that identifies the traceable product's essential product and packaging characteristics (product specification, type of meat cut, level of processing, level of cooking, and packaging, etc.). The preferred identification is the GTIN, but the supplier stock-keeping unit (SKU) may also be used (as indicated by the Item ID Type). For all events, the use of the GTIN as the item identifier is *strongly encouraged*, as it is globally unique and denotes both the supplier and product. The supplier SKU is not globally unique, but provides acceptable utility if the Supplier Identity is populated for the event. The Item Identification reference essentially denotes the product "model" and when used in conjunction with the Batch/Lot/Serial number provides an effective and efficient designation of a traceable product production unit moving through the supply chain. The type of Item is indicated by the Item Type element, and values include:

- Global Trade Item Number (GTIN);
- Universal Product Code (U.P.C.);
- Supplier Stock Keeping Unit (SKU); or
- Supplier Reference (Text value such as "ANIMAL LOT")

STATUS: Required for all events.

DATA SOURCE: Typically the GTIN is present on case-end labels, packaging, and shipping documents as human readable text and is normally encoded in the GS1-128 barcodes printed on case-end labels. If the GTIN is not present, the supplier's Stock Keeping Unit (SKU) or other marking that best identifies that product can be captured. When using an item type other than a GTIN or U.P.C., the Supplier Identity data element should be used to identify the supplier.

NOTE: The retailer SKU is NOT an acceptable Item Identification value, as it does not denote a specific supplier, since retailer SKUs can be interchangeably sourced from different suppliers.

6.7 BATCH/LOT/SERIAL NUMBER

DEFINED: A unique coded identifier assigned by the product supplier that unites products that have undergone combination, transformation, packaging, or manipulation under a common set of circumstances such as time, production crew, or ingredient lot. If more than one batch, lot (the terms batch and lot as defined here are used interchangeably), or serial number is involved in the event, a separate event is reported for each along with the quantity of product marked with each batch/lot or serial number. The Batch/Lot/Serial Number has value only when used in conjunction with the Item Identification element value.

STATUS: Required for transformation type events, supplier shipping events, and best practice for all other event types.

DATA SOURCE: This marking is typically printed on case-end labels packaging, and shipping documents in human readable text and may be encoded in the GS1-128 barcodes printed on a case-end labels. If the item is a private label item supplied from multiple sources, the private-label brand owner needs to ensure that items sourced from different suppliers can be distinguished by the batch/lot/serial number.

6.8 QUANTITY

DEFINED: The Quantity is a numeric value that indicates the amount of product involved in the event.

STATUS: Required for all events and has relevance only when used in conjunction with the Unit of Measure element value.

DATA SOURCE: This value is the summary of all product that shares the event being reported and is computed by the event owner. A Unit of Measure should always be used in conjunction with the quantity reported.

6.9 UNIT OF MEASURE

DEFINED: The Unit of Measure is the designation that indicates the measurement unit (e.g., pallet, cases, inner packs, consumer items) associated with the Quantity reported for the event.

STATUS: Required for all events and has value only when used in conjunction with the Quantity element value.

DATA SOURCE: This value is the unit of measure for the summary quantity of all product reported for that event by the event owner. The unit of measure only has value when reported in conjunction with the Quantity value.

NOTE: When the item is identified by GTIN, the unit of measure should be level of the product hierarchy associated with that GTIN (e.g., if the Item ID is a GTIN from a case-end label, the unit of measure is a case).

6.10 ACTIVITY ID

DEFINED: The Activity ID is used to uniquely identify a segment of production for a transformation event or a set of products shipped for a transportation event. For example, in a transformation event, the Activity ID ties the identity of the input products with the corresponding output products. For transportation activities, the Activity ID may be a purchase order number or a bill of lading number that as a reference number identifies the set of products shipped and received. The type of Activity ID number is indicated by the Activity ID Type element, and for transformation events values may be the:

- Production Order number;
- Process Order number
- Batch/Lot Relevant Date; or
- Work Order number.

For Transportation events, the Activity Type may be the:

- Purchase Order number;
- Invoice number;
- Sales Order number;
- Bill of Lading number;
- Export Certificate number;
- Import Certificate number;
- UPS Tracking number;
- FedEx Tracking number; or
- USPS Tracking number.

STATUS: Required for transformation type events and Conditional for transportation type events. However, for transportation events, when batch/lot/serial numbers are not captured, the Activity ID should be captured.

DATA SOURCE: This value must be determined by the event owner using relevant records.

6.11 BATCH/LOT RELEVANT DATE

DEFINED: The Batch/Lot Relevant Date is the lot control date (sell-by date, expiration date, production date) used by the product supplier to identify consumer-level items.

STATUS: Best Practice for consumption events involving consumer-level items sold at retail or used in foodservice operations that are not marked with a batch/lot number. Otherwise, Conditional depending on event circumstances, although Suppliers should always report the Relevant Date at time of shipping and for all Transformation Output events to associate that date with each Batch/Lot number for that Item ID.

DATA SOURCE: This value must be determined by the event owner using production records or from human readable text on case-level or consumer-item level packaging. These dates will be typically labeled “Use By,” “Sell By,” or “Produced On.”

6.12 SUPPLIER IDENTITY

DEFINED: Supplier Identity is the identifier that indicates the party that supplied the input product used to create a traceable product. The Supplier Identity data element should be used to identify the supplier, that is, the grower/producer or brand owner of the product, when the item type is not a GTIN or U.P.C. The Supplier Identity value is typically the name of the company as a text value.

STATUS: Conditional for Transformation Input events and used typically when the input item is marked with an Item ID other than a GTIN, such as supplier's stock-keeping unit (SKU) number.

DATA SOURCE: The Supplier Identity is reported by the event owner as determined by input product labels and on-site knowledge of those reporting the event.

6.13 TRADING PARTNER LOCATION

DEFINED: The Trading Partner Location is the location (e.g., the plant, warehouse, building, or loading dock door) of the trading partner involved in the transportation event. For Shipping events, the Trading Partner Location is the location where the product will be received, and for Receiving events, the Trading Partner Location is the location from which the product was shipped. The purpose of the Trading Partner Location is to link each transportation event to its counterpart event, so that both the shipping and receiving locations are linked for every transportation event. The preferred identification is the GLN.

STATUS: Required for shipping and receiving events

DATA SOURCE: The Trading Partner Location is reported by the event owner as determined by shipping documentation and on-site knowledge of those reporting the event.

7 GS1 STANDARDS AS A SOURCE OF KEY DATA ELEMENTS

GS1 Standards are the “common language of business” and provide the global framework needed to support the traceability business process. GS1® is a not-for-profit global standards organization with member affiliates in over 110 countries. Together with national meat and poultry trade associations, GS1 provides important resources that are available to help supply chain companies understand the most effective way to implement traceability processes and systems within their organizations.

The GS1 identification numbers were developed by industry and define the globally-accepted method for uniquely identifying:

- Trading partners (suppliers, customers, and transportation carriers identified by GLNs);
- Trading locations (any physical location such as a warehouse, packing line, storage facility, receiving dock or store identified by GLNs);
- The product items used or created by a company (identified by GTINs);
- The logistics units received or shipped by a company [identified by Serial Shipping Container Codes (SSCC)]; and
- Inbound and outbound shipments [identified by Global Shipment Identification Numbers (GSIN)].

With GS1 Standards providing globally unique party, location, and product identifiers that are in wide use by the meat and poultry supply chain in the US and abroad, they have special utility as values for KDEs. This section reviews their use as values for specific KDEs.

Some identification values used in the meat and poultry industry are not currently supported by GS1 Standards. An example would be animal identification, where GTINs are not assigned to live animals. In such cases, the animal or animal lot identifiers commonly used by industry would then be used as the value for the Item ID Key Data Element. To be clear, KDE values do not require GS1 Identifiers, but when available, GS1 Identifiers are particularly effective as KDE values because of their supply chain-wide usage and globally unique reference characteristic.

Additionally, GS1 has defined a Global Traceability Standard that defines essential information that should be collected, recorded and shared to ensure “one step up, one step down” traceability. This GS1 traceability standard was developed before the CTE concept emerged, but is complementary and can be applied to companies of all sizes and geography.

While the use of CTEs and GS1 Identifiers may be implemented independently of any specific technology, best business practices recommend the adoption of barcoding on cases, consumer items, and pallets to assist with information capture at the time of an event. Trading partners are further encouraged to adopt electronic messaging and event management information systems to exchange essential business information.

NOTE: GS1 does not presently support the electronic synchronization of GLNs as a service of the Global Data Synchronization Network™ (GDSN®), which presently allows trading partner information management systems to only synchronize product item information. GS1 could facilitate the global adoption of the GLN as a party identifier in supply chain traceability systems by adding support for GLN synchronization to the GDSN.

7.1 GLOBAL TRADE ITEM NUMBER AS AN ITEM ID REFERENCE

Use the 14-digit, case-level GTIN for the product item key data element when a GTIN has been assigned to the traceable product. This number is typically printed on each case label or is embedded in the GS1 barcode as shown in the figure below. The GTIN is preceded by the “(01)” identifier in each barcode.



Figure 7. Example of a GS1-128 Case-Level Barcode

If the case-level GTIN is not available, the 12-digit, consumer-level Universal Product Code (U.P.C.) as shown in the figure below can be captured for a fixed weight product.



Figure 8. Example of a GS1 Universal Product Code

7.1.1 HOW DOES MY COMPANY ASSIGN GTINS

GS1 publishes general guidance on GTIN allocation. The meat and poultry supply chain has product characteristics that are different from general grocery items, so additional GTIN allocation guidance is provided in the GS1 Trade Item Implementation Guide “Fresh Foods” section. In addition to the general allocation guidelines, meat and poultry suppliers and brand owners should also allocate GTINs in accordance with the following rules:

- Assign separate GTINs for each different packaging type such as case-ready, tray-ready, and store-processed product.
- Assign separate GTINs for each primary refrigeration state in which a product is continuously marketed (e.g., if product is normally marketed in both a chilled and frozen state, assign different GTINs to each refrigeration state).
- Assign separate GTINs to products that have different marketing claims or production methods when such characteristics are an important marketing feature to buyers (e.g., free-range versus conventional poultry).
- Assign separate GTINs for each different pallet and case configuration as recommended by the GS1 GTIN allocation rules.
- The brand owner must use their GS1 Company Prefix number to create the GTIN for each item that carries their brand name. The brand owner may be the producer or the retailer. In the case of a private-label grocery retailer brand, the retailer’s GS1 Company Prefix would be used regardless of the supplier that provides the product.

To learn more about GTIN and the GTIN allocation rules visit www.gs1us.org.

7.1.2 WHAT DOES THE GTIN PACKAGING INDICATOR DESIGNATE?

The first position of the 14-digit GTIN is used to indicate the product’s packaging hierarchy level. The GTIN indicator value for consumer item items is always 0, and the packaging indicator for a variable-weight case is always be 9. Otherwise, the indicator may be any value between 1 and 8 for identification of the product hierarchy when packaging levels for a product are traded in the supply chain.

To learn more about GTINs and GTIN packaging indicator rules visit www.gs1.org.

7.2 GS1 APPLICATION IDENTIFIERS AS A BATCH/LOT/CASE SERIAL NUMBER REFERENCE

Parties that report CTEs should capture the supplier’s batch or lot number from the product packaging whenever available. The batch or lot number is typically printed on each case label or corrugate and can be embedded in the GS1-128 barcode after the “(10)” application identifier for batch/lot number as in Figure 11 above.

For variable-weight products, the supplier may mark each case with a unique case serial number instead of using a batch/lot number. In these products, the case serial number is printed on each case label and is embedded in the GS1-128 barcode after the “(21)” application identifier.

NOTE: Because each case serial number tracks only the product within that single case, each case of product should be individually reported throughout the supply chain. This could necessitate a separate event to be captured and reported for each case involved in that event, whereas all cases with the same batch/lot number can be reported with one event. For example, if 3 pallets, each with 45 cases, all are marked with the same batch/lot number, the shipment of these cases to the same location can be reported as one event, whereas if these cases are marked with individual case serial numbers, 135 “events” would need to be reported, one for each case serial number. Event owners should be aware that the use of case serial numbers will increase the level of reporting detail by the supplier and potentially by down-stream trading partners compared to the option of using batch/lot numbers to identify that same production unit.

7.2.1 HOW DOES MY COMPANY IDENTIFY PRODUCT BATCHES OR LOTS IN THE SUPPLY CHAIN?

All suppliers should assign Batch/Lot Numbers (the terms batch and lot as defined here are used interchangeably) or Case Serial Numbers to case-level products they create. The content, syntax, and format of the batch/lot number itself typically varies from one company to another, depending on company practice and the precision desired.

For example, a lot can represent all product produced in a day at one facility or the product produced in one hour from an individual packing line or it could represent a unique recipe run. It is important to remember that the range of product assigned to a single batch/lot number also defines the minimum amount of product that may need to be removed from the supply chain in the event of a recall. This needs to be considered when defining a company’s standard practice for setting the scope of each batch/lot number for each type of product that it produces.

In addition to the batch/lot number, some suppliers also assign a unique serial number to each variable-weight case and record the beginning and ending case serial numbers for each batch or lot. Case serial numbers are assigned to each case at the time of packing by the supplier. The format of the serial number may include a code representing the production facility and production date and time followed by a unique sequential number. Serial numbers may also be generated without any intelligent prefix (e.g., a simple sequential number without any production facility or production date and time reference). It is the responsibility of the supplier to ensure the uniqueness of the batch/lot or serial numbers when paired with the product GTIN for all products in the supply chain and to be able to associate all case serial numbers to a production facility and date and time. Measures should be taken to prevent the re-use of batch/lot or serial numbers before all existing product in the supply chain has been depleted.

Regardless of whether a batch/lot number or a case serial number is used, the number should be clearly identified and marked on the package in a human readable format. Human readable numbers should be clearly labeled such as by placing the text “Lot Number” next to the batch/lot number value (e.g., “Lot No: F-310063”). Item ID and Batch/Lot/Serial number information should also be encoded into a GS1-128 barcode format using the appropriate application identifiers, which for a batch/lot number is “(10)” as shown in Figure 11. Application Identifiers (AIs) are GS1 identifiers that enable additional information about the product to be provided within the barcode so that when scanned the information can be electronically captured. A list of common AIs used for meat and poultry are included in the Glossary in [Appendix A](#).

Human readable numbers located below each GS1 barcode are not considered adequate to meet the human readable requirement because they are not clearly labeled data elements. Even though logistics supply chain operators may be able to interpret application identifier code numbers (such as “(10)” for the Batch/Lot number), the application identifier is not a substitute for a clearly labeled data element.

7.2.2 DETERMINING TRACE GRANULARITY

The granularity of the production unit, or amount of product identified with the same production unit markings, varies as shown in the figure below. Suppliers should decide what level of granularity is best for each of their products considering the value of the product should a withdrawal or recall occur, and the level of effort needed to report traceability events throughout the supply chain. Effective traceability will generally entail the use of a product item number (i.e., a GTIN or SKU that indicates the product style) and a batch/ lot designation for each production unit.

Trace Granularity

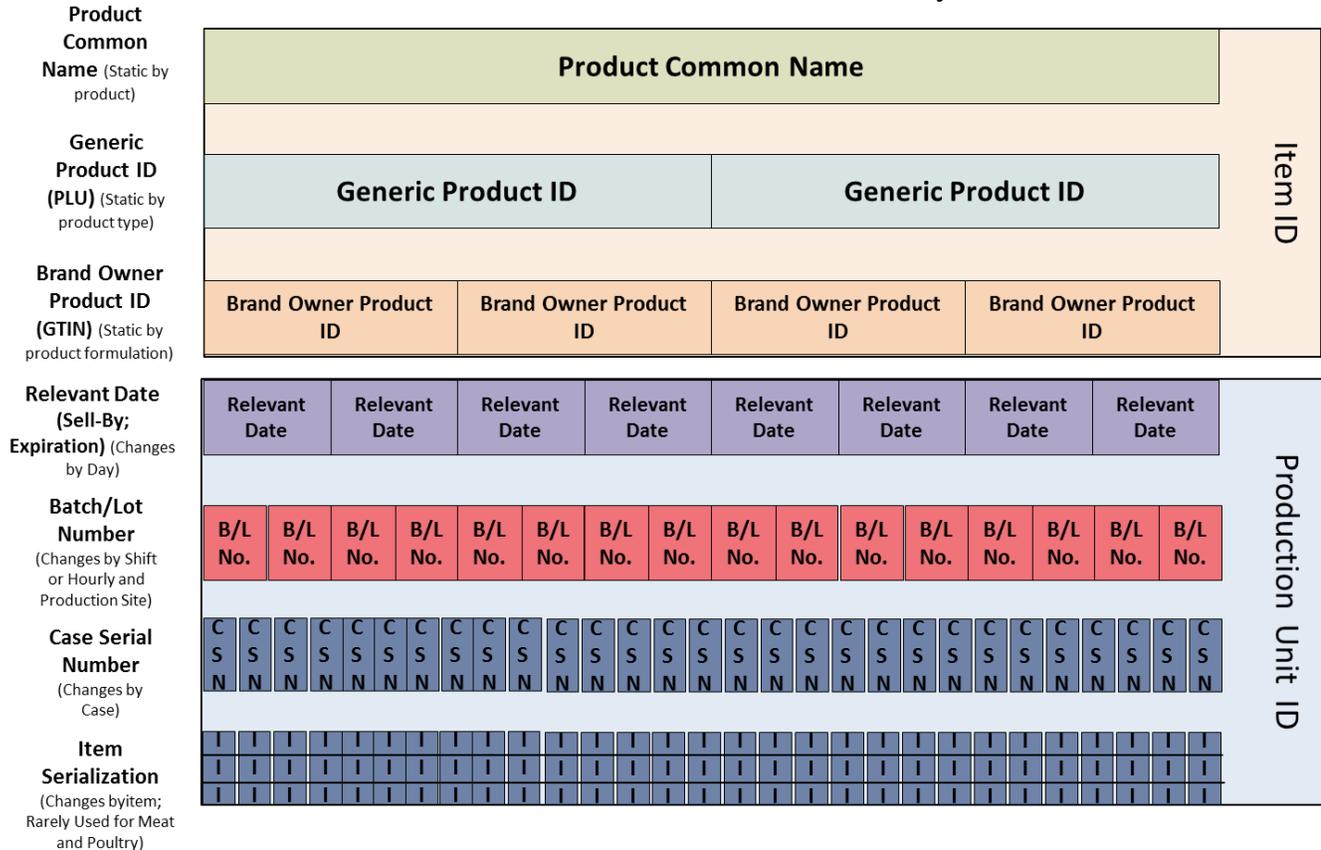


Figure 9. Relative Trace Granularity of Different Product Unit Identifiers

7.3 GLOBAL LOCATION NUMBERS AS AN EVENT OWNER, EVENT LOCATION, AND SHIP TO/FROM LOCATION REFERENCE

A Global Location Number (GLN) is a unique location identification number for a physical or legal entity. A GLN is a 13 digit, globally unique number comprised of the GS1 Company Prefix and a Location Reference that is assigned by the owner of the physical or legal entity.

The GLN may be assigned at a very high level to represent an entire corporation or can also be assigned to a granular level to represent a specific warehouse receiving door. It is recommended that trading partners in the meat and poultry industry at least assign GLNs to all of their physical production and storage locations to provide globally unique location identification for their traceability processes. To learn more about GLN assignment visit www.gs1us.org.

8 EXAMPLES OF CRITICAL TRACKING EVENTS MANAGED IN THE MEAT AND POULTRY SUPPLY CHAIN

Although each supply chain segment and company will encounter unique challenges in capturing KDE data depending on the level of automation and the volume of product handled, a basic set of generic examples can be used to show the basic flow of events. Examples of the data to be captured and the source of that data for each key data element are shown in the following CTE examples.

Those elements designated “Core Event” or “Core Product” elements in the figures are consistently required and present in all messages. Other non-core elements may provide essential context for certain messages (e.g., the Batch/Lot/Serial Number), but are not consistently present in every event message.

Examples of CTE events for the meat and poultry supply chain are shown in the sections that follow. The common source of each KDE is categorized as being either:



From Static Sources (readily captured or observed at the time of the event, such as date and time);



From Operator (determined or verified by a human operator at the time of the event);



From Documents (present as human readable text on documents available at the time of the event);



From Barcodes (values encoded in barcodes on product packaging or logistics documents);
or



From IT System (information commonly available from company information system databases).

8.1 MANAGEMENT OF THE TRANSFORMATION INPUT EVENT (T1)

Companies use traceable products as an input to the transformation process whenever they create new traceable product that they will place into the supply chain. Two common input scenarios are the use of products marked with a GTIN, and the use of products that are not marked with a GTIN.

8.1.1 TRANSFORMATION INPUT OF TRACEABLE PRODUCT MARKED WITH GTINS

Ideally, all traceable input products will be marked with a GTIN and a batch/lot number. When processing products such as these, the supplier would populate the KDEs for the T1 event as follows:

ACTION	CAPTURES
<p>OPERATOR OR THE IT SYSTEM RECORDS DATA AT THE TIME THE PRODUCT IS INTRODUCED INTO THE TRANSFORMATION PROCESS</p>	<p>Event Type (<i>Transformation Input T1</i>) Event Owner Date of Event Time of Event Event Location</p>
<p>OPERATOR READS OR SCANS THE PRODUCT IDENTIFICATION AND BATCH/LOT INFORMATION AND DETERMINES THE QUANTITY OF PRODUCT USED</p>	<p>Item ID Type (<i>GTIN</i>) Item ID Batch/Lot Number or case serial number Quantity (<i>operator calculates based on quantity of product used in that event</i>) Unit of Measure Activity ID (<i>e.g. Production order</i>)</p>

Table E. Actions to Capture KDEs When Transforming Input Products Marked with GTINs

NOTE: Whenever the GTIN item type is referred to in event reporting, parties may still choose to use internal company product ID types such as the SKU for internal company tracking. However, internal company product references should be converted to the GTIN when events are reported to other supply chain partners or government health authorities.

The source of each KDE for a supplier documenting a T1 event of a product with a GTIN is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	TRNSFRM INPUT T1	R
		Event Owner	1111100000019	R
		Date	121210	R
		Time	16:25:00	R
		Event Location	1111100005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	10122330016239	R
		Quantity	1.25	R
		Unit of Measure	CASES	R
		Batch/Lot No.	F-310063	R
		Activity Type	Production Order	R
		Activity ID	130123-06	R



Figure 10. Capture of KDEs When Transforming Input Products Marked with GTIN

8.1.2 TRANSFORMATION INPUT OF TRACEABLE PRODUCT NOT MARKED WITH GTINS

Although traceable products should always be marked with a GTIN as a best practice, the nature of some products, such as live animals, is such that a GTIN is not typically used for product identification. When processing products such as these, companies can populate the KDEs for the T1 event as follows:

ACTION	CAPTURES
<p>OPERATOR OR THE IT SYSTEM RECORDS DATA AT THE TIME THE INPUT PRODUCT IS INTRODUCED TO THE PRODUCTION PROCESS</p>	<p>Event Type (<i>Transformation Input T1</i>) Event Owner Date of Event Time of Event Event Location</p>
<p>OPERATOR READS OR SCANS THE PRODUCT IDENTIFICATION INFORMATION FROM THE PACKAGE MARKINGS OR A RELATED PRODUCT DOCUMENT</p>	<p>Item ID Type (<i>Supplier SKU or ANIMAL LOT</i>) Item ID Batch/Lot Number Quantity (<i>Operator calculates based on amount of product used for that event</i>) Unit of Measure Activity ID Supplier Identity (<i>Text value used to identify the product supplier because the Item ID is not a globally unique product identifier</i>)</p>

Table F. Actions to Capture KDEs When Transforming Input Products not marked with GTINs

The source of each KDE for a supplier documenting a T1 event of a product without a GTIN is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	TRNSFRM INPUT T1	R
		Event Owner	1111100000019	R
		Date (YYMMDD)	121210	R
		Time	16:25:00	R
		Event Location	1111100005559	R
CORE PRODUCT		Item ID Type	ANIMAL LOT	R
		Item ID	LIVE CHICKENS	R
		Quantity	34180	R
		Unit of Measure	LBS	R
		Batch/Lot/Serial No.	0423491	R
		Supplier Identity	0018345-01	C
		Activity Type	Production Order	R
		Activity ID	130123-06	R

American Producers, Inc.

LIVE RECEIVING REPORT
12/10/2012 10:35 AM

TRUCK No: 0012578	GROWER No: 0018345
TRAILER No: 0003982	HOUSE No: 0018345-01
	FLOCK No: 0423491
LOADED Weight: 68,060 LBS	WEATHER: Sunny
EMPTY Weight: 33,880 LBS	
TOTAL Weight: 34,180 LBS	DRIVER On: Yes
	TARP On: No

Figure 11. Capture of KDEs for Input Products Not Marked with GTIN

8.2 MANAGEMENT OF THE OUTPUT PRODUCT TRANSFORMATION EVENT (T2)

T2 Product Transformation events are the result of taking one or more inputs and creating a new product to enter the supply chain, for example, taking a chicken breast and adding marinade and breading and cooking to produce a full-cooked, lemon-marinated, breaded chicken breast fritter. The lemon marinated, breaded chicken breast fritter is the output product of the T2 event created from the various T1 input events.

Companies that transform products should always use GTINs to identify traceable products to be placed into the supply chain and either a batch/lot number or serial case numbers to identify the production unit of that product. In-store product transformations such as when a retail grocer cuts primal meat to produce consumer retail units use the relevant date (Sell By Date) in place of a batch/lot number for production unit identification, since there is no case (and therefore no case serial number or batch/lot number) assigned to these items.

Information used by companies to populate the KDEs for traceable output products is captured through the following actions:

ACTION	CAPTURES
<p>THE OPERATOR OR SYSTEM RECORDS DATE, TIME, OWNER AND LOCATION DATA AT THE TIME OF THE EVENT</p>	<p>Event Type (<i>Transformation Output T2</i>) Event Owner (GLN) Date of Event Time of Event Event Location (GLN)</p>
<p>OPERATOR RECORDS SCANS CASE LABELS OF PRODUCT AS PRODUCT IS CONFIGURED ONTO PALLETS AND CONSULTS PRODUCTION RECORDS FOR FINAL PRODUCT TOTALS FOR EACH GTIN AND PRODUCTION UNIT. A PRODUCTION ORDER NUMBER IS CAPTURED AS AN ACTIVITY ID NUMBER TO LINK THIS OUTPUT EVENT TO RELATED INPUT EVENTS.</p> <p><i>Note: Fixed weight product may have only human readable batch/lot information and operator counts of cases may be manual and not through case label scanning.</i></p>	<p>Item ID Type (<i>GTIN</i>) Item ID Batch/Lot/Serial Number Quantity Unit of Measure (<i>Cases</i>) Relevant Date Activity Type Activity ID</p>

Table G. Actions to Capture KDEs for Transformation Output Events

NOTE: Variable weight cases will typically use serial numbers (AI 21) to identify cases, and fixed weight products will use batch/lot numbers (AI 10).

NOTE: When reporting product dates on case labels, the AI 15, Best By Date, is typically preferred by grocery retail customers, and AI 17, Expiration Date, by foodservice customers.

The source of each KDE for a supplier documenting a transformation output event is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	TRNSFRM OUTPUT T2	R
		Event Owner	1111100000019	R
		Date	121211	R
		Time	10:25:00	R
		Event Location	1111100005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008889	R
		Quantity	1	R
		Unit of Measure	CASES	R
		Serial Number	1234567890	R
		Relevant Date	130123	C^
		Activity Type	Production Order	R
		Activity ID	130123-06	R

GOLDEN POULTRY COMPANY, INC.
6941 Central Ave; Colesville, AR, 23021

00888
Serial No: 1234567890
SELL BY: JAN 23 2013
NET WT:41.5 Lbs

**RTC BBQ Chicken Breast, Skin-On
Case-Ready Bubble-Pack**



(01)90111110008889(15)130123(3201)000415(21)1234567890

Figure 12. Capture of KDEs to Document Transformation Output Events

8.3 MANAGEMENT OF THE CONSUMPTION EVENT

The Consumption Event is the event where product is made available to the consumer either by placing bulk product into a service case or by selling a consumer packaged product to a customer. Careful documentation of these events is critical, as they designate which product items and production lots were consumed by humans and would be events of immediate interest when illness outbreaks occur.

When companies sell traceable product to a consumer, the product will either be in individual consumer-ready packages marked with consumer information that includes a barcode for point-of-sale use, or as bulk product placed into a full-service display case such as delicatessen meat loafs. For full-service display cases, the consumption event is captured when product cases such as those containing delicatessen loafs are opened and the product is available for consumer purchase and consumption. For consumer-ready packaged product, the consumption event is captured at the time of sale, and involves consumer-ready packages marked with a GS1 U.P.C. Prefix 2, a GS1 DataBar, or a fixed weight U.P.C. Grocery retailers will capture the sale of consumer products transactionally at the point of sale along with the store location, date, and time of day. Additionally, when a shopper loyalty card is used, the transaction will also be associated with an individual consumer, which has high value to health authorities when investigating a food illness outbreak.

8.3.1 CONSUMPTION EVENT WHEN A CONSUMER PURCHASES A PACKAGED PRODUCT MARKED WITH A U.P.C.-PREFIX 2

Both suppliers and grocery retailers can create consumer-ready packages of meat and poultry that consumers select from self-service display cases. These consumer-ready packages are marked with product labels that allow product-related key data elements to be captured when the consumer purchases the package at the point-of-sale register. Information used to populate the KDEs of the consumption event for a consumer-ready package marked with U.P.C.-Prefix 2 is as follows:

ACTION	CAPTURES
<p>POINT OF SALE SYSTEM SCANS THE U.P.C. - PREFIX 2 CODE ON THE PACKAGE AND RECORDS DATE, TIME, OWNER AND LOCATION DATA AT THE TIME OF THE EVENT</p>	<ul style="list-style-type: none"> Event Type (<i>Consumption</i>) Event Owner (<i>HQ GLN of retailer</i>) Date of Event Time of Event Event Location (<i>GLN of retail store</i>) Item ID Type (<i>Item reference such as the PLU</i>) Item ID (<i>PLU value</i>) Quantity (<i>1</i>) Unit of Measure (<i>Consumer Package</i>)

Table H. Actions to Capture KDEs for Consumption Event of a Consumer-Ready Package Marked with a U.P.C.-Prefix 2

NOTE: For supplier-provided, case-ready consumer packages, capture the supplier U.P.C Prefix and four-digit PLU from each U.P.C. Prefix 2 scanned at point of sale. Although the supplier U.P.C Prefix is a proprietary number set by the retailer, it assists the retailer in determining the supplier’s identity for that item. For in-store transformed product, the retailer should have Transformation Input and Output events that will match the four-digit PLU scanned at the time of the point-of-sale transaction. Although the relevant date for the product will not be captured at the point of sale using the U.P.C. Prefix 2 barcode, the date of sale can be used to review retailer transformation events for that PLU on the day of sale as well as the past several days before the date of sale to determine the input ingredients.

The source of each KDE for a grocery retailer documenting a point-of-sale purchase of a consumer-ready package marked with a U.P.C.-Prefix 2 is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	CONSUMPTION	R
		Event Owner	4444400000019	R
		Date	121214	R
		Time	16:25:00	R
		Event Location	4444400005559	R
CORE PRODUCT		Item ID Type	PLU	R
		Item ID	37024	R
		Quantity	1	R
		Unit of Measure	PACKAGE	R



Retail Store Point-of-Sale System generates Event Location (Store), Item ID, and quantity after scanning the Type-2 U.P.C. code

Figure 13. Capture of KDEs for Consumer-Ready Package Marked with a U.P.C.-Prefix 2

NOTE: The consumption data captured for the sale of a fixed-weight consumer product marked with a normal U.P.C. would be the same as above, except that the Item ID Type would be "U.P.C." and the Item ID would be the scanned 12-digit U.P.C. code.

8.4 CONSUMPTION EVENT WHEN A CONSUMER PURCHASES A PACKAGED PRODUCT MARKED WITH A GS1 DATABAR

Information used to populate the KDEs of the consumption event for a consumer-ready package marked with a GS1 DataBar is as follows:

ACTION	CAPTURES
<p>POINT OF SALE SYSTEM SCANS THE GS1 DATABAR CODE ON THE PACKAGE AND RECORDS DATE, TIME, OWNER AND LOCATION DATA AT THE TIME OF THE EVENT</p>	<ul style="list-style-type: none"> Event Type (<i>Consumption</i>) Event Owner (<i>HQ GLN of retailer</i>) Date of Event Time of Event Event Location (<i>GLN of retail store</i>) Item ID Type (<i>GTIN</i>) Item ID (<i>GTIN value</i>) Quantity (<i>Number of packages or weight of package</i>) Unit of Measure (<i>Consumer Package, LBs, or KGs</i>) Relevant Date (<i>Sell By or Use By Date</i>)

Table I. Actions to Capture KDEs for Consumption Event of a Consumer-Ready Package Marked with a GS1 DataBar

NOTE: The use of the GS1 DataBar is a best practice for point-of-sale consumption event reporting, as it captures the traceable product's GTIN, batch/lot number, and Relevant Date to precisely designate the product item ID and production unit that was consumed. The U.P.C. Prefix 2, in comparison, only captures the product's PLU, a high-level product ID with less granularity than the GTIN, and does not capture a production unit (batch/lot or relevant date) value.

The source of each KDE for a grocery retailer documenting a purchase of a consumer-ready package marked with a GS1 DataBar is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	CONSUMPTION	R
		Event Owner	4444400000019	R
		Date	121214	R
		Time	16:25:00	R
		Event Location	4444400005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	00444440076249	R
		Quantity	1	R
		Unit of Measure	PACKAGE	R
		Relevant Date	130123	C

Retail Store Point-of-Sale System generates Event Location (Store), Item ID, and quantity after scanning the DataBar code



Figure 14. Capture of KDEs for Consumption Event of Consumer-Ready Package Marked with GS1 DataBar

8.4.1 CONSUMPTION EVENT WHEN A TRACEABLE CASE-LEVEL PRODUCT IS PLACED INTO A FULL SERVICE DISPLAY CASE

When a supply chain company first opens a sealed container or a case of product to place that product where it can be sold to consumers without further transformation (other than slicing and point-of-sale packaging), such as when a grocery retailer opens a case of bulk chicken breasts to create value-added stuffed chicken breasts for sale in a full-service case, that action should be documented as the Consumption Event. Capture of the product item ID and production unit information is critical for rapid response to reported foodborne illness events.

Information used to populate the KDEs of the consumption event when the product is first opened for preparing foodservice items is as follows:

ACTION	CAPTURES
<p>THE OPERATOR OR SYSTEM RECORDS DATE, TIME, OWNER AND LOCATION DATA AT THE TIME OF THE EVENT</p>	<p>Event Type (<i>Consumption</i>) Event Owner (<i>HQ GLN of retailer</i>) Date of Event Time of Event Event Location (<i>GLN of retail store</i>)</p>
<p>OPERATOR SCANS THE GS1 BARCODE ON THE CASE LABEL PACKAGE AND RECORDS THE TOTAL QUANTITY OF PRODUCT IN THAT OPENED CASE WITH THAT BATCH/LOT/SERIAL NUMBER</p>	<p>Item ID Type Item ID (<i>GTIN or U.P.C.</i>) Quantity (<i>Assumed to be total contents of container</i>) Unit of Measure Batch/Lot/Serial Number</p>

Table J. Actions to Capture KDEs for Consumption Event When Case-Level Product Becomes Available to Consumers

NOTE: The key difference between a consumption event and a transformation event is that after a transformation event, the product is placed into the supply chain for transfer to another trading partner. After a consumption event, the product is transferred to or becomes immediately available to the consumer by the event owner of the consumption event. See [Section 11](#) for further discussion of how to determine whether an event is a consumption event or a product transformation event.

The source of each KDE for a foodservice operator or grocery retailer documenting the consumption of case-level traceable product when it first becomes available to consumers is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	CONSUMPTION	R
		Event Owner	3333300000019	R
		Date	121216	R
		Time	16:25:00	R
		Event Location	3333300005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008659	R
		Quantity	1	R
		Unit of Measure	CASES	R
		Batch/Lot/Serial	123456677	BP

GOLDEN POULTRY COMPANY, INC.
6941 Central Ave; Colesville, AR, 23021

00865
Serial No: 123456677
SELL BY: JAN 23 2013
NET WT:41.5 Lbs

RTC Chicken Breasts With Rib Meat



(01)90111110008659(15)130123(3201)000415(21)123456677

Figure 15. Capture of KDEs for Consumption Event of Case-Level Product

8.5 MANAGEMENT OF THE SHIPPING EVENT

KDEs should be captured for all products shipped between supply chain trading partners and optionally for product shipped between processing locations of the same company.

8.5.1 SHIPPING EVENT USING THE ADVANCE SHIP NOTICE

As a best practice, any company that ships a traceable product to another trading partner should capture and report the supplier's product item ID and the batch/lot or case serial number as marked on the product packaging. Additionally, product suppliers, that is, the company responsible for last transforming the product, should always capture and report the product item ID and batch/lot or case serial number as core data elements when shipping traceable product to a supply chain partner. Capturing the item ID and batch/lot/serial number allows the supplier to know when and to whom each lot of traceable product has been shipped.

Suppliers typically scan the case end labels of variable-weight product cases as they are produced and placed onto pallets. Although this scanning is necessary for the capture of product weight, it also allows the supplier to automate the capture of batch/lot/serial number information and support the generation of an electronic Advance Ship Notice (ASN) message for product recipients. Although fixed weight product case labels are not typically scanned at time of production, case counts by batch/lot number are maintained and are associated with each configured pallet. Companies other than original suppliers do not typically scan product case labels upon shipping or delivery, and therefore activity numbers such as a purchase order number are captured to allow related paper records to be reviewed should batch/lot or serial number information be needed at a later time.

Shipping information from the ASN can be used as a best practice to populate the KDEs of the shipping event as follows:

ACTION	CAPTURES
<p>THE OPERATOR OR SYSTEM RECORDS DATE, TIME, OWNER AND LOCATION DATA AT THE TIME OF THE EVENT.</p>	<p>Event Type (<i>Shipping</i>) Event Owner Date of Event Time of Event Event Location</p>
<p>OPERATOR RECORDS NUMBER OF FIXED-WEIGHT CASES BY ITEM AND BATCH/LOT NUMBER AS PRODUCT IS CONFIGURED ONTO PALLETS AT TIME OF PRODUCTION OR SCANS CASE LABELS OF VARIABLE-WEIGHT PRODUCT AS PRODUCT IS CONFIGURED ONTO PALLETS. OPERATOR THEN CONSULTS PRODUCTION RECORDS AT TIME OF SHIPMENT OR SCANS THE PALLET SERIAL SHIPPING CONTAINER NUMBER AT TIME OF SHIPMENT.</p>	<p>Item ID Type Item ID Batch/Lot/Serial Number Quantity Unit of Measure Relevant Date</p>
<p>OPERATOR INPUTS THE TRADING PARTNER LOCATION FROM SHIPPING DOCUMENTS.</p>	<p>Trading Partner Location (<i>GLN preferred</i>)</p>

Table K. Best Practice Actions to Capture KDEs for Shipping Events

The source of each KDE for a supplier documenting a shipping event using case scanning to produce an ASN is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	SHIPPING	R
		Event Owner	1111100000019	R
		Date	121213	R
		Time	13:25:00	R
		Event Location	1111100005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008889	R
		Quantity	1	R
		Unit of Measure	CASES	R
		Batch/Lot/Serial	1234567890	BP*
		Relevant Date	130123	C
		Trading Partner Location	2222200005559	R

GOLDEN POULTRY COMPANY, INC.
6941 Central Ave; Colesville, AR, 23021

00888
Serial No: 1234567890
SELL BY: JAN 23 2013
NET WT:41.5 Lbs

RTC BBQ Chicken Breast, Skin-On
Case-Ready Bubble-Pack



(01)90111110008889(15)130123(3201)000415(21)1234567890

Figure 16. Best Practice Capture of KDEs When Shipping Products

NOTE: In some transportation events, the buyer picks the product up at the buyer's location. In these cases, the shipping event should designate the Trading Partner Location to be the same as the Event Location. Ultimately, the transportation thread will be maintained by the buyer creating a Product Received event where they show the Trading Partner Location as the pick-up location and the Event Location as the product received location.

8.5.2 SHIPPING EVENT USING SHIPPING DOCUMENTS

A core set of KDE's should always be captured for every shipping event. When ASNs are not used to ship products to receivers, those receivers typically do not have production unit information about products on each pallet unless they scan each incoming case.

When receivers later ship this product to their down-stream supply chain partners, in most cases they only know the quantity of cases for each Item ID. To associate this shipped product back to hard-copy documentation that would contain expiration dates or batch/lot/serial number information, shippers can report the Purchase Order Number or some other reference that uniquely identifies each shipment as the Activity Number. In the event of a later recall, these shippers can use the Activity Number reference to determine which customers could have possibly received product with a suspect expiration date and then contact all these customers with the recall request.

Shipping information from shipping documents can be used to populate the KDEs of the shipping event is as follows:

ACTION	CAPTURES
<p>THE OPERATOR OR SYSTEM RECORDS DATE, TIME, OWNER AND LOCATION DATA AT THE TIME OF THE EVENT</p>	<p>Event Type (<i>Shipping</i>) Event Owner Date of Event Time of Event Event Location</p>
<p>OPERATOR RECORDS THE ITEM ID, CASE QUANTITY, AND PURCHASE ORDER NUMBER TO IDENTIFY SHIPPING DOCUMENTS WITH PRODUCTION UNIT INFORMATION FOR REVIEW IF A RECALL OR WITHDRAWAL REQUEST IS LATER RECEIVED.</p>	<p>Item ID Type Item ID Quantity Unit of Measure Activity Type (<i>Purchase Order</i>)</p>
<p>OPERATOR INPUTS THE TRADING PARTNER LOCATION FROM SHIPPING DOCUMENTS.</p>	<p>Trading Partner Location (<i>GLN as a best practice</i>)</p>

Table L. Minimally Acceptable Actions to Capture KDEs for Shipping Events

The source of each KDE for a distributor using shipping documents to document a shipping event is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	SHIPPING	R
		Event Owner	2222200000019	R
		Date	121208	R
		Time	10:25:00	R
		Event Location	2222200005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008889	R
		Quantity	800	R
		Unit of Measure	CASES	R
		Trading Partner Location	3333300005559	R
		Activity Type	Purchase Order No	C
		Activity Number	PO-2255-3	C

GOLDEN POULTRY COMPANY, INC.
6941 Central Ave; Colesville, AR, 23021

00888
Serial No: 1234567890
SELL BY: JAN 23 2013
NET WT:41.5 Lbs

RTC BBQ Chicken Breast, Skin-On
Case-Ready Bubble-Pack



(01)90111110008889(15)130123(3201)000415(21)1234567890

Operator records the Item ID, case quantity, and purchase order number to identify shipping documents with production unit information for later review.

Figure 17. Minimally Acceptable Capture of KDEs When Shipping Products

8.6 MANAGEMENT OF THE RECEIVING EVENT

Companies receive traceable products that they place into inventory and then ship to partners downstream or use as input products in product transformations. In the meat and poultry supply chain, products are most commonly received using shipping documents, but can also be received using an electronic ASN. Additionally, suppliers can deliver traceable product directly to stores using a process known as Direct Store Delivery (DSD).

8.6.1 RECEIVING EVENT USING THE ADVANCE SHIP NOTICE

In the meat and poultry supply chain, a best practice is to send an electronic ASN message when shipping traceable product to provide the receiver with detailed traceability and inventory management data for all products in the shipment. The detailed product in the electronic message can be used by the receiver to populate the KDEs of the receiving event as follows:

ACTION	CAPTURES
ASN RECEIVED FROM PRODUCT SUPPLIER	For each SSCC, the ASN includes the quantity of each GTIN marked item by batch/lot number or case serial number; the product expiration date; and may also include the Ship-From location as a GLN.
OPERATOR OR THE IT SYSTEM RECORDS DATA AT THE TIME OF THE EVENT	Event Type (<i>Receiving</i>) Event Owner (<i>Receiver of the product</i>) Date of Event Time of Event Event Location
OPERATOR SCANS SSCC ON EACH PALLET RECEIVED	SSCC
IT SYSTEM USES SSCC TO FIND THE RELATED KDE DATA IN THE ASN MESSAGE	Item ID Type Item ID Batch/Lot or Case Serial Number Quantity Unit of Measure Relevant Date

Table M. Actions to Capture KDEs for Receiving Event Using an ASN

The source of each KDE for a distributor using an ASN to document a receiving event is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	RECEIVING	R
		Event Owner	2222200000019	R
		Date	121214	R
		Time	16:25:00	R
		Event Location	2222200005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008889	R
		Quantity	1	R
		Unit of Measure	CASES	R
		Batch/Lot/Serial	1234567890	BP
		Relevant Date	130123	C
		Trading Partner Location	1111100005559	C



Calculated from IT System by using scanned SSCC to find KDE information contained in the ASN message

Figure 18. Capture of KDEs for a Receiving Event Using an ASN

8.6.2 RECEIVING EVENT USING SHIPPING DOCUMENTS

The information on the shipping documents can be used to populate the KDEs of the receiving event as follows:

ACTION	CAPTURES
<p>OPERATOR RECORDS DATA AT THE TIME OF THE EVENT</p>	<p>Event Type (<i>Receiving</i>) Event Owner (<i>Receiver of the product</i>) Date of Event Time of Event Event Location</p>
<p>OPERATOR READS SHIPPING DOCUMENTS RECEIVED AND SCANS A CASE LABEL OF AN ITEM ON EACH PALLET THAT IS LISTED ON THE PO. THE OPERATOR THEN ENTERS THE APPROXIMATE NUMBER OF CASES ON THAT PALLET THAT HAVE THE SAME EXPIRATION DATE AS THE CASE SCANNED. THIS PROCESS IS REPEATED UNTIL ALL EXPIRATION DATES FOR THAT ITEM ON THAT PALLET ARE ACCOUNTED FOR.</p>	<p>Item ID Type Item ID Quantity Unit of Measure Activity ID (<i>typically a PO number and/or product expiration date</i>)</p>
<p>OPERATOR INPUTS THE TRADING PARTNER LOCATION FROM SHIPPING DOCUMENTS.</p>	<p>Trading Partner Location (<i>GLN preferred</i>)</p>

Table N. Actions to Capture KDEs for Receiving Event Using Shipping Documents

When distributors receive traceable product from another trading partner, the most common method used to capture product information is to use the shipping documents and case markings. The distributor identifies each product from the GTIN or SKU number marked on the case or by scanning a case barcode and verifies that the item is on the purchase order. The distributor then records the quantity of the item on the pallet by expiration date. The process is repeated until all products on all pallets have been recorded. While some distributors may have the capability to scan the case barcode of each case in a delivery to capture the batch/lot number, this activity is both time-consuming and labor-intensive. In most cases, batch/lot numbers will not be recorded when data is captured from case labels and/or shipping documents.

However, some distributors may scan the case labels of all cases in a delivery, which would allow the batch/lot number to be captured. But because case scanning is so labor intensive, distributors typically cannot report receipt by batch/lot numbers when using shipping documents to receive product.

The source of each KDE for a distributor using shipping documents to document a receiving event is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	RECEIVING	R
		Event Owner	2222200000019	R
		Date	121214	R
		Time	16:25:00	R
		Event Location	2222200005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008889	R
		Quantity	800	R
		Unit of Measure	CASES	R
		Trading Partner Location	1111100005559	R
		Relevant Date	130123	C
		Activity Type	Purchase Order No	C
		Activity Number	PO-2255-3	C

Operator counts number of cases on each pallet with same GTIN and Sell By Date as case scanned and enters that number as the case quantity

GOLDEN POULTRY COMPANY, INC.
6941 Central Ave; Colesville, AR, 23021

00888
Serial No: 1234567890
SELL BY: JAN 23 2013
NET WT: 41.5 Lbs

**RTC BBQ Chicken Breast, Skin-On
Case-Ready Bubble-Pack**



(01)90111110008889(15)130123(3201)000415(21)1234567890

Figure 19. Capture of KDEs for a Receiving Event Using Shipping Documents

8.6.3 RECEIVING EVENT USING DIRECT STORE DELIVERY

Traceable product can be delivered by the product supplier directly to the grocery retail store or foodservice restaurant, a process known as Drop-Ship or Direct Store Delivery (DSD). DSD can include supplier delivery of product to the store cooler or stock room or placement into the consumer display case. When a product supplier delivers product directly to the store, the supplier becomes the owner of the receiving event. This ownership typically allows the product supplier to report both the product item and production unit information for the receiving event. The information on the supplier’s shipping documents can be used to populate the KDEs of the receiving event as follows:

ACTION	CAPTURES
<p>SUPPLIER RECORDS DATA AT THE TIME OF THE EVENT</p>	<p>Event Type (<i>Receiving</i>) Event Owner (<i>Supplier of the product</i>) Date of Event Time of Event Event Location (<i>GLN of the Store</i>)</p>
<p>SUPPLIER MAY REPORT TOTAL CASES DELIVERED BY ITEM ID OR BY ITEM ID AND RELEVANT DATE OR BY ITEM ID AND CASE BATCH/LOT/SERIAL NUMBERS USING PRODUCTION OR SHIPPING RECORDS. RECEIVERS MAY CONFIRM CASE COUNT BY ITEM ID.</p>	<p>Item ID Type Item ID Batch/Lot/Serial Number (<i>As best practice</i>) Quantity Unit of Measure Relevant Date (<i>typically a product sell-by date for retailers or an expiration date for foodservice operators</i>)</p>
<p>SUPPLIER INPUTS THE TRADING PARTNER LOCATION FROM SHIPPING DOCUMENTS.</p>	<p>Trading Partner Location (<i>GLN of Supplier’s shipping location</i>)</p>

Table O. Actions to Capture KDEs for Receiving Event Using Direct Store Delivery

NOTE: Supplier ownership of both the shipping and receiving event creates an additional efficiency in event reporting. Because the same party owns the shipping and the receiving event, the shipping event does not need to be reported, as it would be the same party reporting the same information in the shipping event that is reported for the receiving event. Therefore, when using DSD, the supplier only needs to capture and report the receiving event to document that the traceable product was shipped and received at the specified receiving location.

Cross Docking is a delivery practice where pallets with one or more products are configured for delivery to each store by a product supplier, but are delivered first to the distribution center and then transported to the store without further pallet configuration. Unlike DSD where the receiving event is owned by the supplier, the cross-docking receiving event is owned by the receiving party and both the shipping and receiving events should be captured for cross-docked deliveries and reported as typical shipping and receiving events. Note that stores do not normally have the same level of staff dedicated to supporting product receipt as do distribution centers, so data capture at stores is limited to at best a case count by item ID.

The source of each KDE for a supplier documenting a DSD receiving event at a grocery retailer store with production records is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	RECEIVING	R
		Event Owner	1111100000019	R
		Date	121215	R
		Time	11:15:00	R
		Event Location	3333300007779	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008889	R
		Quantity	27	R
		Unit of Measure	CASES	R
		Trading Partner Location	1111100005559	R
		Relevant Date	130123	C

GOLDEN POULTRY COMPANY, INC.
6941 Central Ave; Colesville, AR, 23021

00888
Serial No: 1234567890
SELL BY: JAN 23 2013
NET WT:41.5 Lbs

**RTC BBQ Chicken Breast, Skin-On
Case-Ready Bubble-Pack**



(01) 90111110008889 (15) 130123 (3201) 000415 (21) 1234567890

Supplier may report total cases delivered by item ID OR by item ID and relevant date OR by item ID and case batch/lot/serial numbers using production or shipping records.

Figure 20. Capture of KDEs for a Receiving Event Using Direct Store Delivery

8.7 MANAGEMENT OF THE DISPOSAL EVENT

The disposal event is the event where product is either destroyed, or modified to make it unfit for consumption. This event marks the removal of traceable product from the supply chain and is the last event captured for disposed product.

8.7.1 DISPOSAL EVENT FOR TRACEABLE PRODUCT

When companies determine that traceable product should be removed from the supply chain because the product has insufficient economic value or is suspect for any reason, data needs to be captured as a Disposal Event to document the removal of the product from the supply chain in the event of a later recall. Capture of the item ID is essential, and the capture of batch/lot/serial number is highly encouraged as a best practice. Typically, the disposal event will entail manually recording the item and batch/lot information from each case to be disposed or scanning the case or pallet labels to obtain the same information. Since the volume of product disposed at one time and place is typically limited, the event owner will be able to typically capture of the item ID and batch/lot/serial number for each case disposed.

Information used to populate the KDEs of the disposal event is as follows:

ACTION	CAPTURES
<p>THE OPERATOR OR SYSTEM RECORDS DATE, TIME, OWNER AND LOCATION DATA AT THE TIME OF THE EVENT</p>	<p>Event Type (<i>Disposal</i>) Event Owner Date of Event Time of Event Event Location</p>
<p>OPERATOR RECORDS THE ITEM ID AND BATCH/LOT OR SERIAL NUMBER INFORMATION OR SCANS THE CASE LABELS OF PRODUCT BEING DESTROYED.</p>	<p>Item ID Type Item ID Batch/Lot/Serial Number Quantity Unit of Measure</p>

Table P. Actions to Capture KDEs for Disposal Event

The source of each KDE for a grocery retailer documenting a disposal event is summarized below:

	SOURCE	KDES	VALUES	USE
CORE EVENT		Event Type	DISPOSAL	R
		Event Owner	4444400000019	R
		Date	130129	R
		Time	15:35:00	R
		Event Location	4444400005559	R
CORE PRODUCT		Item ID Type	GTIN	R
		Item ID	90111110008219	R
		Quantity	1	R
		Unit of Measure	CASES	R
		Serial Number	12345455	BP

GOLDEN POULTRY COMPANY, INC.
6941 Central Ave; Colesville, AR, 23021

00821
Serial No: 12345455
SELL BY: JAN 23 2013
NET WT:41.5 Lbs

RTC Whole Chicken With Giblets



(01)90111110008219(15)130123(3201)000415(21)12345455

Figure 21. Capture of KDEs When Disposing of Traceable Product

9 IMPLEMENTATION FACTORS FOR DISTRIBUTORS

Distributors of meat and poultry products principally manage transportation and disposal events. Although distributors receive pallets of product, they typically reassemble products to fill orders onto different pallets before shipping products out, so distributors routinely manage products at the case level and ship pallets with a mixture of products.

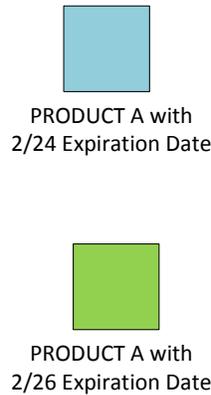
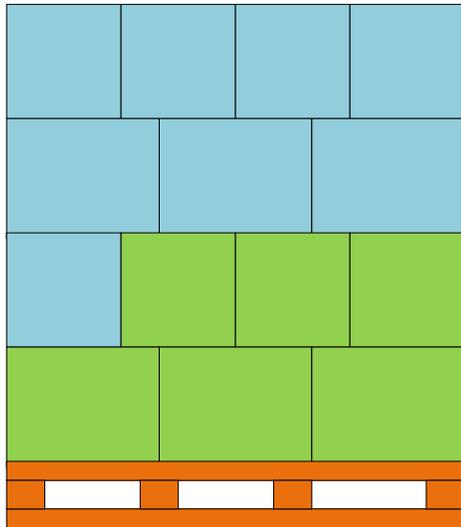
When shipping a traceable product to a food service operator or a grocery retailer distribution center or store location, distributors “pick” product to be shipped from pallets received from suppliers. A key implementation factor that impacts distributors is whether they ship from stored product that has been segregated by expiration date or from stored products that has not been segregated by expiration date.

Stored Product Not Segregated by Expiration Date: Typically, distributors do not segregate stored products by expiration date and can only report the item ID for the shipping event without any production unit information. In situations where product is picked from pallets with more than one expiration date, distributors do not know with certainty how many cases of each expiration date were shipped. However, they do know the two or more expiration dates that could have been part of that shipment.

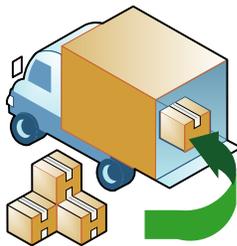
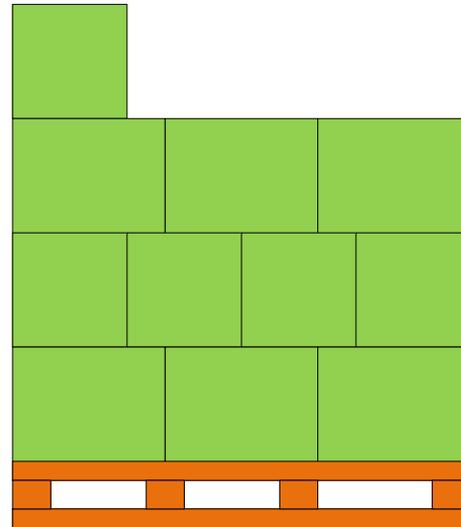
NOTE: If the critical tracking event data model could accommodate multiple values for a relevant date, distributors could report all expiration dates that may have been present in a shipping event when stored product is not segregated by expiration date.

Stored Product Segregated by Expiration Date: Some distributors may, as a best practice, segregate meat and poultry products received by item ID (either a GTIN or a SKU) and expiration date onto separate pallets. These distributors are therefore able to report shipping events by item ID *and an expiration date* when picking product. Shipping product that has been segregated by expiration date will provide better production unit reporting for the shipping CTE than shipping product that has not been segregated by expiration date.

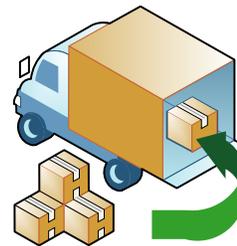
WHEN STORED PRODUCT NOT SEGREGATED BY EXPIRATION DATE



WHEN STORED PRODUCT SEGREGATED BY EXPIRATION DATE



SHIPPING EVENTS CAN REPORT ONLY PRODUCT ID



SHIPPING EVENTS CAN REPORT PRODUCT ID AND RELEVANT DATE

Figure 22. CTE Reporting for Product that is Segregated and Not Segregated by Expiration Date

NOTE: In discussing how to improve shipping traceability, distributors considered that the following process, not in present practice, could be used to provide exact knowledge of which item by batch/lot or case serial number was delivered to each location. Distributors generally affix proprietary stickers (with invoice number, expiration date, PO line) onto each case of an outbound order. If suppliers were to consistently place GS1-128 labels onto product cases (including fixed weight product cases), distributors could scan those supplier labels at the time they place their proprietary sticker onto the case and associate the supplier's item number, batch/lot or case serial number, and expiration date with the proprietary case label. When distributors deliver product to the destination, distributors typically scan the distributor's proprietary label on each case to ensure complete delivery. The distributor would then know through association with the supplier's item number, batch/lot, and expiration date, the exact quantity by item number and batch lot delivered to each location. If this process is feasible, it could be implemented as a preferred best practice.

10 IMPLEMENTATION FACTORS FOR FOODSERVICE OPERATORS

Foodservice operators that use meat and poultry products will typically manage transportation, consumption, and disposal events. In some cases, when products are further processed by the foodservice operator and packaged into consumer packages labeled for consumer sale, operators will also need to manage product transformation events.

Case-Level Consumption: Since prepared foodservice menu items are either not packaged or not sold in packaging with traceability data that can be scanned at the time of purchase, a foodservice store operator will report the opening of product at the case-level as the consumption event. For example, when a store operator first opens a case of ready-to-cook product to prepare a foodservice item, that entire case of product is considered to be consumed and the case opening is documented as the Consumption Event. Capture of both the product item ID and production unit information such as a batch/lot/serial number or a sell-by date is critical for rapid response to reported foodborne illness events, should menu items prepared using product from that case later be implicated.

NOTE: One government reviewer suggested that case-level consumption be tracked to capture a last-item used date and time as well as a first-item used (case opened) date and time. Although this would add additional complexity to the event model, it could provide useful precision to health authorities interested in determining consumer "exposure" to production units in full service display cases and in foodservice restaurants. If the last-item-used date and time is not captured, event owners will use their knowledge of product consumption patterns at that location to conservatively calculate the latest date and time that product from that case could still have been available to consumers.

Item-Level Consumption: Some foodservice ingredients may be used at the item, inner pack, or container level, such as frying oil or spices. Because these items may not have been shipped in case-level quantities or the case they were shipped in may not be available, they should be documented as consumed when the item, inner pack, or container is first opened, even if the contents of the container may not be completely consumed for a period of time. Containers from cases that were documented as consumed when first opened do not need to be reported as consumed for a second time at the item or container level.

"Retail" Take-Home Items: Foodservice operators may transform products at a store or a central processing site and package them into consumer packages labeled for consumer sale. Labeling would include a foodservice operator-managed product item ID number and an operator-assigned production unit reference such as a Sell-By, Use By, or Production Date. Foodservice operators that have valid transformation events to manage should follow the appropriate examples for capturing transformation input and output events.

Figure 39 summarizes when a traceable product that is processed at either a foodservice operator store or a grocery retailer store is considered to be transformed or consumed. Because the production of consumer packaged product happens over a defined, short period of time compared to the stocking and restocking of a service case, and the consumer product can be marked to note the supplier of the input products (the supplier code of the U.P.C. Prefix 2 or the GTIN of the DataBar). Therefore, the production of consumer-packaged product is reported as a product transformation, whereas product placed into a full-service display case or used to prepare food service menu items is considered consumed at the time the case is first opened and product used.

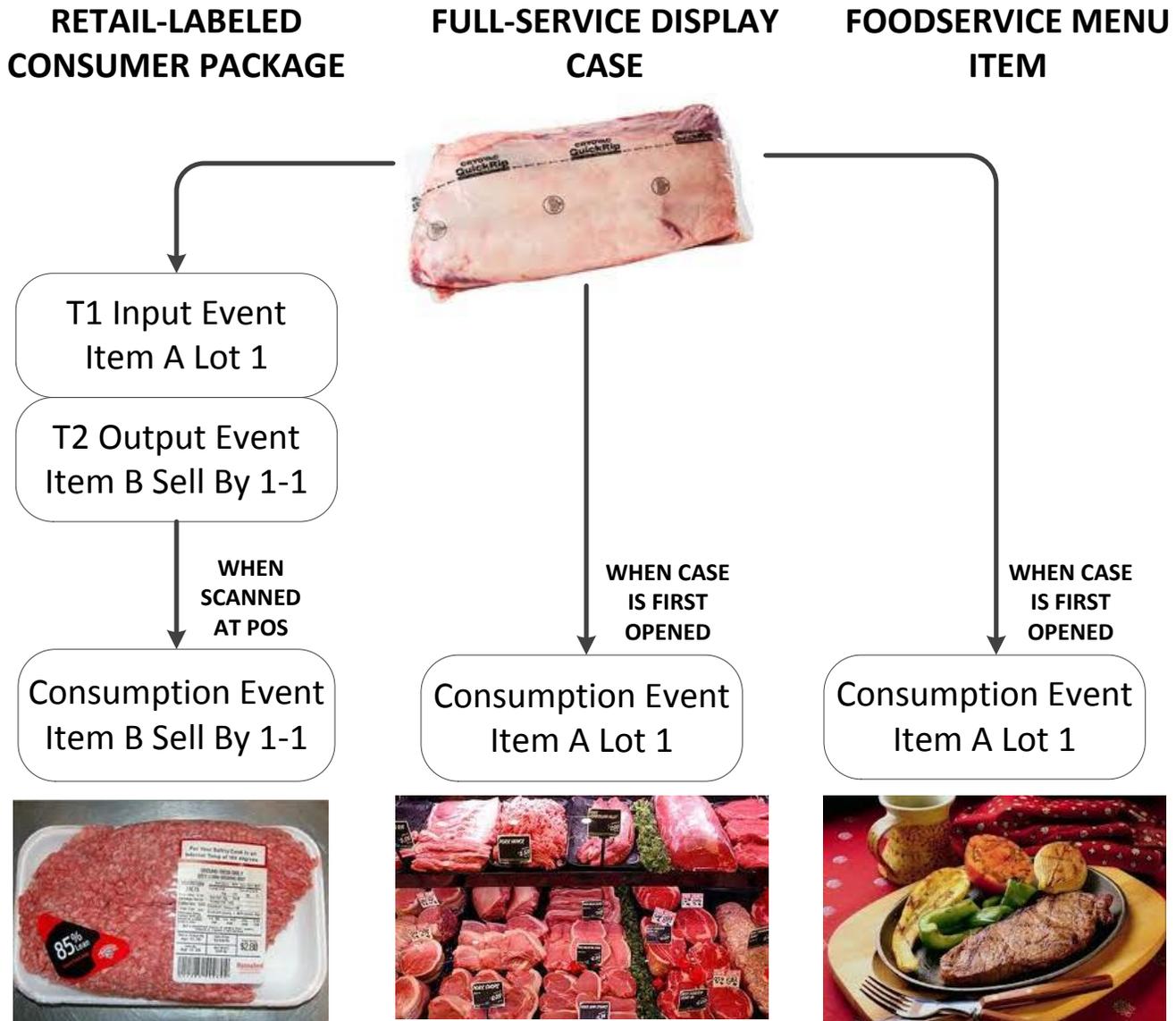


Figure 23. Understanding When Store-Processed Product is Transformed or Consumed

NOTE: A key difference between an event where a product used as an ingredient for a foodservice menu item and an event where a product is used as an ingredient for a consumer-packaged retail product is that in the foodservice menu item is not a labeled, packaged traceable product entering the supply chain. Therefore, traceable product used to prepare a foodservice menu item should be reported as consumed when the product case is first opened, whereas the traceable product used to create a consumer-packaged retail product is captured as a Product Transformation T1 Event and the consumption event is the final sale of the consumer-packaged product.

11 IMPLEMENTATION FACTORS FOR GROCERY RETAILERS

Grocery retailers of meat and poultry products commonly manage receiving, consumption, and disposal events. In some cases, grocery retailers also process bulk or primal-type meat and poultry products at a distribution center or retail stores into consumer-sized portions or repackaging products for consumer sale. For such product transformations, the product should be identified by a grocery retailer-managed product item or reference number and a retailer-assigned production unit reference such as a Sell-By, Use By, or Production Date.

Store-Transformation Event Management: The three common output transformation scenarios for grocery retailers are the production of retailer-packaged product with package labels that are marked with a:

- 1) GS1 U.P.C.-Prefix 2 barcode when product items have a variable weight and price;
- 2) GS1 U.P.C. when product items have a fixed weight and price; or
- 3) GS1 DataBar for variable and fixed weight items (present level of adoption is minimal, but use would strengthen event traceability for meat and poultry products).

NOTE: Product weighed and packaged by retailer staff on demand for consumers, such as luncheon meat sold at a delicatessen counter, are NOT product transformations, but handled as Consumption events when the product case is first opened.

Linking Transformation Events for U.P.C.-Prefix 2-Marked Products: Transformation Output T2 events always have to be associated by an Activity Number to corresponding Transformation Input T1 events. In the case where the output product will be marked with U.P.C.-Prefix 2, the item reference code (PLU) is used as the Activity ID to identify the related input and output products.

Linking Transformation Events for U.P.C. or DataBar-Marked Products: In the case where the output product will be marked with a fixed weight U.P.C. or GS1 DataBar, the U.P.C. or GTIN in the DataBar is used as the Activity ID in the T2 event to identify the related output product. The same output product code will be used as the Activity ID in the corresponding T1 event for that store location, and the three key data elements together - Activity ID, Event Date and Event Location – will distinguish the production unit of the product. The output event should also include the sell-by date of the product as well, which becomes the production unit designator for all product of that Item ID produced at that store for that day.

NOTE: When an input product is used to create output products with different PLU or GTINs, a separate input event is needed for each output product that is created from that input product.

RETAIL STORE PROCESSING INPUT EVENT

KDES	VALUES	USE
Event Type	TRNSFRM INPUT T1	R
Event Owner	4444400000019	R
Date	121211	R
Time	16:25:00	R
Event Location	4444400005559	R
Item ID Type	GTIN	R
Item ID	90111110008889	R
Quantity	2	R
Unit of Measure	CASES	R
Batch/Lot No.	1234567890	R
Activity Type	PLU	R
Activity ID	7034	R

RETAIL STORE PROCESSING OUTPUT EVENT

KDES	VALUES	USE
Event Type	TRNSFRM OUTPUT T2	R
Event Owner	4444400000019	R
Date	121211	R
Time	16:25:00	R
Event Location	4444400005559	R
Item ID Type	PLU	R
Item ID	7034	R
Quantity	25	R
Unit of Measure	CONSUMER PACKAGE	R
Activity Type ID	PLU	R
Activity ID	7034	R
Relevant Date	130120	C

ACTIVITY ID OF RELATED INPUT AND OUTPUT EVENTS ARE SET TO THE ITEM ID OF THE OUTPUT PRODUCT;

THEN EVENT DATE, LOCATION, AND ACTIVITY ID WILL LINK ALL INPUT AND OUTPUT EVENTS FOR ALL PRODUCT WITH THE SAME EXPIRATION DATE.

Figure 24. Activity ID for Store Processed Product to be Marked with U.P.C. Prefix 2 Barcodes

12 POTENTIAL USE OF EDI MESSAGES FOR REPORTING CRITICAL TRACKING EVENT DATA

EDI is commonly used by supply chain companies to share business information, and is neutral in terms of technology platform. The ASC X12 Electronic Data Interchange (EDI) 105 Business Entity Filings transaction set may be used to carry the key data elements of each critical tracking event. This EDI message could be adopted as one acceptable means of reporting CTE data to health authorities or sharing CTE data with trusted trading partners.

A summary example of how an EDI 105 Business Entity Filings transaction message could transmit CTE data is shown in Figure 41.

NOTE: This message needs to be officially established before it can be used to transmit CTE data.

BUSINESS EXAMPLE:

Acme Meat Company produces chili-cheese flavored hot dogs. On January 3, 2013, along with the hot dog meat (T1), containers of cheddar cheese (T1) that had not been properly refrigerated were put into the meat mixture to create the hot dogs (T2) at the Harvard Avenue facility. The chili-cheese flavored hot dogs then went into cold storage.

There were 105 cases produced, with serial numbers CCD20130300001 through CCD20130300105.

Forty cases of the product were shipped (S) to Jonson Supermarkets on February 22nd.

The cheese problem was caught by a clear-eyed shift supervisor reviewing various facility and production records on February 28th. The company immediately put a hold on any further product shipments and also created an electronic commerce record of the event, which was transmitted to the Jonson Supermarkets as well as to requesting regulatory agencies.

T1 – denotes a Transformation Input Event

T2 – denotes a Transformation Output Event

S – denotes a Shipment Event

Within the context of electronic commerce, the X12 EDI 105 Business Entity Filing transaction set may be used to report the critical tracking event/key data element information to a trading partner, interested third party or regulatory agency. Also, to recall a product, the X12 EDI 143 Product Service Notification transaction set may be used. What follows is an example of the EDI data that would be sent in support of this business example.

Implementation guidelines for these and other business processes are available from GS1 US.



EDI EXAMPLE:

EDI DATA FOLLOWS BELOW IN THIS COLUMN	EXPLANATION OF THE EDI DATA IS IN THIS COLUMN
EDI SEGMENT ST*105*000010~ BGN*02*REPORT 127*20130203*1155**IM~ NM1*O2*4*ACME MEAT CO*****UL*0061414001003~	EDI SEGMENT COMMENTS 105 Transaction set start, with unique ID 000010 A new Report 127 dated 3/23/2013 at 11:55 AM, A Critical Tracking Event report Acme Meat Co. is the originating company, with a GLN of 0061414001003.
Detail Information follows - -----	
HL*1**EV~ EF1*00~ HL*2*1*BE~ NM1*HA*4*ACME MEAT CO*****UL*0061414001003~ PER*IC*DAVID JONES*TE*3153259832*EM*DJ@ACME.COM~	Report Level of the transaction Non-classified company report Business entity/event owner/event reporter Party reporting the event is Acme Meat Company Contact is David Jones, with phone & email
HL*3*2*41~	PRODUCT LEVEL
NM1*ALO*4*ACME MEAT PROCESSING PLANT #4~ N3*1427 E. HARVARD AVENUE~ N4*Humboldt*UT*31523~ DTM*AAH*20130103~ LM*FD~ NM1*ST*4*JONSON WHSE 33*****UL*0061414102124~	Event/activity location is Acme Meat Processing Plant 4 Located on Harvard Avenue Located in Humboldt, UT Event date occurred was January 3, 2013 Code source values provided by GS1 US Ship to location was Jonson Supermarkets warehouse
<i>Product input #1</i>	
LQ**T1 ~ LIN*UK*00641414100002*SK*8MP389383~ DTM*710*20130103~ QTY*01*25*CT~ REF*BT*F-310063~ REF*7R*130123-06*Production Order	T1- Transformation Input Event Hot dog meat product GTIN and SKU Relevant date of product 25 cartons of meat used Input batch ID Production order 130123-06
<i>Product input #2</i>	
LQ**T1~ LIN*UK*00641414100014*SK*8XP38B36~ DTM*710*20130103~ QTY*01*10*CT~ REF*BT*59023AKA~ REF*7R*130123-06*Production Order	T1- Transformation Input Event Chili cheese product GTIN and SKU Relevant date of product 10 cartons of chili cheese used Input batch ID Production order 130123-06

Continued on next page...

<i>Product Output</i>	
LQ**T2~ LIN*UK*00641414100113~ DTM*710*20130103~ QTY*01*105*CT~ REF*BG*CCD201303000001**EG^CCD20130300105~ REF*CAI*130123-06*PRODUCTION ORDER~	T2- Transformation Output Event Chili cheese hot dog GTIN Relevant date of product 105 cartons of product produced Serial number range of product produced Production order 130123-06
<i>Shipped Product</i>	
LQ**S~ LIN*UK*00641414100113*SK*8ZP38C30~ DTM*011*20130222~ QTY*01*40*CT~ REF*BG*CCD201303000001**EG^CCD20130300040~	S- Shipping Event Chili cheese hot dog GTIN and SKU Ship date of product 40 cartons shipped Serial number range of product shipped
Summary Level follows	Transaction set close-out
SE*39*000010~	39 segments were transmitted for this transaction

Figure 25. Example EDI 105 Message Capable of Transmitting CTE Data to Health Officials or Trusted Trading Partners

13 ADDITIONAL RESOURCES

Global Traceability Standard

http://www.gs1.org/docs/qsmp/traceability/GS1_Global_Traceability_Standard_i1.pdf

Traceability for Meat & Poultry - U.S. Implementation Guide

<http://www.gs1us.org/industries/fresh-foods/meat-and-poultry>

Implementation Guide for GDSN Data Alignment of Meat and Poultry Trade Items

<http://www.gs1us.org/industries/fresh-foods/meat-and-poultry>

Produce Traceability Guidance Documents

<http://www.producetraceability.org>

Building the Fresh Foods Supply Chain of the Future

http://www.fmi.org/forms/uploadFiles/28DBC0000008.toc.RoadmapFinal_exec.pdf

GS1 DataBar

<http://www.gs1.org/barcodes/databar>

14 APPENDIX A: GLOSSARY

TERM	DESCRIPTION
ACTIVITY NUMBER	Identification reference number for an order that can be used to associate all elements of a Critical Tracking Event together. For instance a Purchase Order Number may be used for a shipment, a Sales Order Number may be used to process a customer sale, and a Processing Order Number may be used for a Transformation.
ACTOR	An actor is a role that a user plays with respect to a system.
APPLICATION IDENTIFIER (AI)	The field of two or more digits at the beginning of an element string that uniquely identifies its format and meaning within the GS1 System.
BATCH/LOT NUMBER	A batch number is a unique coded identifier that unites products/items that have undergone combination, transformation, or manipulation of one or more products Batch and Lot are considered synonyms. The Lot number is an identifier that corresponds to a specific grouping/composition of the product.
BILL OF LADING NUMBER (BOL)	A coded identifier to reference the goods included in a shipment between two trading partners.
CARRIER ID	A number used to identify the company or individual responsible for conveyance of goods from one party to another.
CONSUMER ITEM	The trade item intended to be sold to the end customer.
CRITICAL TRACKING EVENT (CTE)	Any occurrence involving an item within the supply chain at a specific location and time that is associated with collection and storage of data useful for associating an item or related items to the specific occurrence at a later time and is determined to be necessary for identifying the actual path of an item through the supply chain.
DEPLETION	A Critical Tracking Event that involves the transfer of custody of a product to the final point in the supply chain. [This could be the sale of an item at retail, the consumption of an item for a finished plate in food service, the move of samples to the final party, or the donation of goods.]
DISPOSAL	A Critical Tracking Event to denote the destruction of an item and removal from the supply chain in a manner making it unfit for consumption.
EVENT	Is an occurrence of a process in a specific time or a period of time?
ELECTRONIC DATA INTERCHANGE (EDI)	The structured transmission of data between organizations by electronic means, which is used to transfer standardized electronic documents or business data from one computer system to another computer system.
EVENT LOCATION GLN	The location that at which a CTE occurred.
EXTERNAL TRACEABILITY	External traceability takes place when instances of a traceable item are physically handed over from one trading partner (traceable item source to another (traceable item recipient).
EVENT TYPE	This will be a code to represent the Type of event that is being reported by the event owner, and is either a Transformation Input, Transformation Output, Shipping, Receiving, Consumption, or Disposal event.
GLN (GLOBAL LOCATION NUMBER)	The globally unique GS1 System identification number for legal entities, functional entities, and physical locations. The GLN is 13 digits, which comprise a GS1 Company Prefix, Location Reference, and Check Digit.
GRAI (GLOBAL RETURNABLE ASSET IDENTIFIER)	The globally unique GS1 System identification number for a reusable package or transport equipment of a certain value, such as a beer keg, gas cylinder, pallet, or crate. The GRAI comprises a mandatory part: the Asset Identification Number (GS1 Company Prefix, Asset Type, and Check Digit) and an optional part: the Serial Number.
GS1 SYSTEM	The specifications, standards, and guidelines administered by GS1. GS1, through the Global Standards Management Process, manages the GS1 System to maintain the most implemented standards in the world.
GSIN (GLOBAL SHIPMENT IDENTIFICATION NUMBER)	The GS1 Identification Key comprising a GS1 Company Prefix, Shipment Reference, and Check Digit used to identify unique shipments.
GTIN (GLOBAL TRADE ITEM NUMBER)	The globally unique GS1 System identification number for products and services. A Global Trade Item Number may be 8, 12, 13, or 14 digits in length, represented as GTIN-8, GTIN-12, GTIN-13, and GTIN-14 respectively.
IDENTIFICATION	The identity assigned to an item or party that is needed to access other relevant information about the item or party.

TERM	DESCRIPTION
IDENTIFICATION CARRIER	Mark/tag/label/accompanying document sometimes called “passport” or “identity card” in some industry sectors.
INTERNAL PROCESS	A series of actions, changes or function(s) within a company or organization that brings about a result.
INTERNAL TRACEABILITY	Internal traceability takes place when a trading partner receives one or several instances of traceable items as inputs that are subjected to internal processes, before one or several instances of traceable items are output.
KEY DATA ELEMENTS (KDEs)	The essential data values captured for a CTE to identify and maintain a chain of custody for an item as it is transformed through the supply chain.
LINK	Recording the information necessary to establish the relationship to other relevant information.
LOCATION	A place where a traceable item was, is, or could now be located [ISO/CD 22519]. A place of production, handling, storage and/or sale. (See also Premises)
LOGISTIC UNIT	An item of any composition established for transport and/or storage that needs to be managed through the supply chain.
LOT/BATCH RELEVANT DATE	A date that is associated with a specific group of products/items that have undergone the same transformation processes. This date may be used in managing the product and could include production dates, use by dates or best by dates.
MASTER DATA	Master Data describes each item and party involved in supply chain processes. Master data is defined as data having the following characteristics:
PARTY	Business entity or specific shipping/receiving location at the discretion of the reporting business entity.
PRICE LOOK UP NUMBER (PLU)	Price Look Up numbers are 4- to 5-digit values that are used to identify a specific product so that the correct unit price and product identification can be associated with that product at time of sale. Although PLU codes are assigned and managed by each retailer, general blocks of PLU numbers are reserved for the different fresh food sectors such as produce, meat, seafood, and dairy.
PREMISES	A parcel of land defined by a legal land description or, in its absence, by geo-referenced coordinates, on which or on any part of which animals, plants or food are grown, kept, assembled, or disposed of.
PROCESS	A series of actions or steps towards achieving a particular end. Examples of common processes include Production, Transformation, Quality Control, Storage, Transportation, Movement, Recycle, Return, Packing, Receiving, Traceability . . .
PRODUCT DESCRIPTION	GS1 Global definition: A piece of information reflecting a characteristic related to an identification number [e.g., an expiration date or a product description related to a GTIN®].
PRODUCTION TRACKING NUMBER	A reference number used to link the items as inputs to a transformation process with the end product that is created during a production cycle.
PRODUCTION UNIT	A set of product that was produced under similar circumstances such as a specified period of time at a specific location or using a specific set of input ingredients. The batch, lot, or case serial number are the most common examples of a product unit.
PURCHASE ORDER NUMBER	A reference number issued by the buyer to reference a transaction to purchase goods from a supplier.
QUANTITY	A precise number of articles, pieces or units. Used in conjunction with Unit of Measure.
RECEIPT DATE	Date/time upon which the goods were received by a given party.
RECEIVING	The act of accepting a shipment of a trading good from another trading partner.
RECORD	Act of creating a permanent piece of information constituting an account of something that has occurred.
SERIAL NUMBER	A unique identifier used to identify an individual case of product.
SGTIN (SERIALIZED GLOBAL TRADE IDENTIFICATION NUMBER)	SGTIN is a method of identifying unique items at the unit or retail level as well as at the case and carton levels. It is composed of a GTIN combined with a Serial Number. Where UCC/EAN barcodes have traditionally been used, the SGTIN specification combined with an RFID tag can give visibility beyond the Item Reference right down to the exact Serial Number of the item.
SHARE	Act of exchanging information about an entity or traceable item with another Trading Partner.

TERM	DESCRIPTION
SHIP DATE	Date on which goods were shipped or dispatched by the Supplier.
SHIP FROM LOCATION	Identification of the party from whom goods will be or have been shipped.
SHIP TO LOCATION	Identification of the party to whom goods will be or have been shipped.
SHIPMENT	An item or group of items delivered to one party's location at one moment in time that have undergone the same dispatch and receipt processes.
SHIPMENT REFERENCE NUMBER	GS1 Global definition: The reference number assigned to a shipment.
SHIPPING	The act of releasing a shipment from one trade partner to go to another.
SSCC (SERIAL SHIPPING CONTAINER CODE)	The globally unique GS1 System identification number for logistic units. The SSCC is an 18-digit number comprising (from left to right) an extension digit, GS1 Company Prefix, Serial Reference, and Check Digit.
SUPPLIER	The party that is responsible for the product transformation events of a traceable item in the supply chain.
TRACE REQUEST	A formal inquiry about the history, application or location of a traceable item. A request can trigger subsequent trace requests up or down the supply chain in order to fulfill the original request. The requesting party requires a response from the data source.
TRACEABILITY	The act of monitoring the elements of CTEs to follow the chain of custody of a product from harvest to depletion. Traceability is the ability to track forward the movement through specified stage(s) of the extended supply chain and trace backward the history, application or location of that which is under consideration.(GS1 Global Traceability Standard, issue 2)
TRACEABILITY DATA	Any information about the history, application or location of a traceable item. This may be either Master Data or Transactional Data.
TRACEABLE ITEM	A physical object where there may be a need to retrieve information about its history, application or location. The level at which the traceable item is defined within a product packaging or logistical hierarchy is dependent on the industry and degree of control required. Could be tracked, traced, recalled or withdrawn. Could exist in multiple locations at the same time (for example, if identified at the trade item and batch level).
TRACING (TRACING BACK)	The ability to identify the origin attributes, or history of a particular traceable item located within the supply chain by reference to records held.
TRACKING (TRACKING FORWARD)	The ability to follow the path of a traceable item through the supply chain as it moves between parties.
TRADE ITEM	Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain.
TRADING PARTNER	Any Supply Chain Partner that has a direct impact on the flow of goods through the supply chain. Examples include Third Party Logistics Provider, Manufacturer, Processors, Retailers, Wholesalers, Distributors, or Operators, and Grower.
TRADING PARTNER GLN	The location identification of the trading partner of the party recording a CTE. For instance in a shipping CTE it would be the location of the person that will receive the product being shipped.
TRAILER NUMBER	A number associated with a specific trailer used to transport goods from one trading partner to another.
TRANSFER NUMBER	A number that can be used to fully identify a shipment to both partners. For instance for a shipment by a carrier a Bill of Lading number may be used.
TRANSFER TYPE	A code to specify the type of Transfer Number included with the CTE such as Bill-of-Lading or Overnight Tracking Number
TRANSFORMATION	The act or result of changing the item such as combining ingredients to make a finished product or repackaging a product such as producing a tray-packed product for consumer sale from cased ingredients. Transformation can be production, aggregation, grouping, splitting, mixing, packing and repacking traceable items.
TRANSPORTER	The party that handles, conveys and/or temporarily stores the traceable item, solely for the sake of transportation from one point to another without transforming the item.

Table Q. Glossary

15 APPENDIX B: GS1 APPLICATION IDENTIFIERS RELEVANT FOR THE MEAT AND POULTRY SUPPLY CHAIN

Notes:

(*):	The first position indicates the length (number of digits) of the GS1 Application Identifier. The following value refers to the format of the data content.
(**):	If only year and month are available, DD must be filled with two zeroes.
(***):	The fourth digit of this GS1 Application Identifier indicates the implied decimal point position. Example: - 3100 Net weight in kg without a decimal point - 3102 Net weight in kg with two decimal points
(FNC1):	All GS1 Application Identifiers indicated with (FNC1) are defined as of variable length and must be limited by a Function 1 Symbol Character unless this Element String is the last one to be encoded in the symbol.

AI	DATA CONTENT	FORMAT*	FNC1 REQUIRED
00	Serial Shipping Container Code (SSCC)	n2+n18	
01	Global Trade Item Number (GTIN)	n2+n14	
10	Batch or Lot Number	n2+X..20	(FNC1)
11 (**)	Production Date (YYMMDD)	n2+n6	
13 (**)	Packaging Date (YYMMDD)	n2+n6	
15 (**)	Best Before Date (YYMMDD)	n2+n6	
17 (**)	Expiration Date (YYMMDD)	n2+n6	
21	Serial Number	n2+n20	(FNC1)
254	GLN Extension Component	n3+X..20	(FNC1)
30	Count of Items (Variable Measure Trade Item)	n2+n..8	(FNC1)
310 (***)	Net weight, kilograms (Variable Measure Trade Item)	n4+n6	
320 (***)	Net weight, pounds (Variable Measure Trade Item)	n4+n6	
330 (***)	Logistic weight, kilograms	n4+n6	
390 (***)	Applicable Amount Payable, local currency	n4+n..15	(FNC1)
391 (***)	Applicable Amount Payable with ISO Currency Code	n4+n..15	(FNC1)
392 (***)	Applicable Amount Payable, single monetary area (Variable Measure Trade Item)	n4+n..15	(FNC1)
393 (***)	Applicable Amount Payable with ISO Currency Code (Variable Measure Trade Item)	n4+n3+n..15	(FNC1)
410	Ship to - Deliver to Global Location Number (GLN)	n3+n13	
411	Bill to - Invoice to Global Location Number (GLN)	n3+n13	

AI	DATA CONTENT	FORMAT*	FNC1 REQUIRED
412	Purchased from Global Location Number (GLN)	n3+n13	
413	Ship for - Deliver for - Forward to Global Location Number (GLN)	n3+n13	
414	Identification of a Physical Location - Global Location Number (GLN)	n3+n13	
415	Global Location Number (GLN) of the Invoicing Party	n3+n13	
422	Country of Origin of a Trade Item	n3+n3	(FNC1)
423	Country of Initial Processing	n3+n3+n..12	(FNC1)
424	Country of Processing	n3+n3	(FNC1)
425	Country of Disassembly	n3+n3	(FNC1)
426	Country Covering full Process Chain	n3+n3	(FNC1)
7002	UN/ECE Meat Carcasses and Cuts Classification	n4+X..30	(FNC1)

Table R. GS1 Application Identifiers Relevant to Meat & Poultry

16 APPENDIX C: LIST OF TABLES AND FIGURES

Table A.	Document Summary.....	5
Table B.	Log of Changes.....	5
Table C.	Contributors.....	5
Table D.	Critical Tracking Event Definitions.....	7
Figure 1.	Common Critical Traceability Events by Segment in the Meat and Poultry Supply Chain.....	8
Figure 2.	Value of Global Item ID with Production Unit and Capture of Consumption and Transformation Events in Rapid Traceback Response.....	11
Figure 3.	Overview of Critical Tracking Events across the Supply Chain.....	12
Figure 4.	Consumption Events Implicate a Specific Supplier Item and Lot.....	13
Figure 5.	Consumption Events Implicate Ingredient Item and Lot.....	14
Figure 6.	Use of Key Data Elements in Critical Tracking Events.....	15
Figure 7.	Example of a GS1-128 Case-Level Barcode.....	21
Figure 8.	Example of a GS1 Universal Product Code.....	21
Figure 9.	Relative Trace Granularity of Different Product Unit Identifiers.....	24
Table E.	Actions to Capture KDEs When Transforming Input Products Marked with GTINs.....	26
Figure 10.	Capture of KDEs When Transforming Input Products Marked with GTIN.....	27
Table F.	Actions to Capture KDEs When Transforming Input Products not marked with GTINs.....	28
Figure 11.	Capture of KDEs for Input Products Not Marked with GTIN.....	29
Table G.	Actions to Capture KDEs for Transformation Output Events.....	30
Figure 12.	Capture of KDEs to Document Transformation Output Events.....	31
Table H.	Actions to Capture KDEs for Consumption Event of a Consumer-Ready Package Marked with a U.P.C.-Prefix 2.....	32
Figure 13.	Capture of KDEs for Consumer-Ready Package Marked with a U.P.C.-Prefix 2.....	33
Table I.	Actions to Capture KDEs for Consumption Event of a Consumer-Ready Package Marked with a GS1 DataBar.....	34
Figure 14.	Capture of KDEs for Consumption Event of Consumer-Ready Package Marked with GS1 DataBar.....	35
Table J.	Actions to Capture KDEs for Consumption Event When Case-Level Product Becomes Available to Consumers.....	36
Figure 15.	Capture of KDEs for Consumption Event of Case-Level Product.....	37
Table K.	Best Practice Actions to Capture KDEs for Shipping Events.....	38
Figure 16.	Best Practice Capture of KDEs When Shipping Products.....	39
Table L.	Minimally Acceptable Actions to Capture KDEs for Shipping Events.....	40
Figure 17.	Minimally Acceptable Capture of KDEs When Shipping Products.....	41
Table M.	Actions to Capture KDEs for Receiving Event Using an ASN.....	42
Figure 18.	Capture of KDEs for a Receiving Event Using an ASN.....	43



Table N.	Actions to Capture KDEs for Receiving Event Using Shipping Documents.....	44
Figure 19.	Capture of KDEs for a Receiving Event Using Shipping Documents	45
Table O.	Actions to Capture KDEs for Receiving Event Using Direct Store Delivery	46
Figure 20.	Capture of KDEs for a Receiving Event Using Direct Store Delivery.....	47
Table P.	Actions to Capture KDEs for Disposal Event	48
Figure 21.	Capture of KDEs When Disposing of Traceable Product.....	49
Figure 22.	CTE Reporting for Product that is Segregated and Not Segregated by Expiration Date	51
Figure 23.	Understanding When Store-Processed Product is Transformed or Consumed.....	53
Figure 24.	Activity ID for Store Processed Product to be Marked with U.P.C. Prefix 2 Barcodes	55
Figure 25.	Example EDI 105 Message Capable of Transmitting CTE Data to Health Officials or Trusted Trading Partners	58
Table Q.	Glossary.....	62
Table R.	GS1 Application Identifiers Relevant to Meat & Poultry	64



PROPRIETARY STATEMENT

This document contains proprietary information of GS1 US. Such proprietary information may not be changed for use with any other parties for any other purpose without the expressed written permission of GS1 US.

IMPROVEMENTS

Improvement and changes are periodically made to publications by GS1 US. All material is subject to change without notice. Please refer to GS1 US website for the most current publication available.

DISCLAIMER

Except as may be otherwise indicated in specific documents within this publication, you are authorized to view documents within this publication, subject to the following:

1. You agree to retain all copyright and other proprietary notices on every copy you make.
2. Some documents may contain other proprietary notices and copyright information relating to that document. You agree that GS1 US has not conferred by implication, estoppels or otherwise any license or right under any patent, trademark or copyright (except as expressly provided above) of GS1 US or of any third party.

This publication is provided "as is" without warranty of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. Any GS1 US publication may include technical inaccuracies or typographical errors. GS1 US assumes no responsibility for and disclaims all liability for any errors or omissions in this publication or in other documents which are referred to within or linked to this publication. Some jurisdictions do not allow the exclusion of implied warranties, so the above exclusion may not apply to you.

Several products and company names mentioned herein may be trademarks and/or registered trademarks of their respective companies. GS1 US does not, by promulgating this document on behalf of the parties involved in the creation of this document, represent that any methods, products, and/or systems discussed or recommended in the document do not violate the intellectual property rights of any third party. GS1 US has not performed a search to determine what intellectual property may be infringed by an implementation of any strategies or suggestions included in this document. GS1 US hereby disclaims any liability for any party's infringement of intellectual property rights that arise as a result of any implementation of strategies or suggestions included in this document.

This publication may be distributed internationally and may contain references to GS1 US products, programs and services that have not been announced in your country. These references do not imply that GS1 US intends to announce such products, programs or services in your country.

NO LIABILITY FOR CONSEQUENTIAL DAMAGE

In no event shall GS1 US or anyone else involved in the creation, production, or delivery of the accompanying documentation be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other loss) arising out of the use of or the results of use of or inability to use such documentation, even if GS1 US has been advised of the possibility of such damages.

IAPMO

In this publication, the letters "U.P.C." are used solely as an abbreviation for the "Universal Product Code" which is a product identification system. They do not refer to the UPC, which is a federally registered certification mark of the International Association of Plumbing and Mechanical Officials (IAPMO) to certify compliance with a Uniform Plumbing Code as authorized by IAPMO.



THE GLOBAL LANGUAGE
OF BUSINESS

CORPORATE HEADQUARTERS
Princeton Pike Corporate Center
1009 Lenox Drive, Suite 202, Lawrenceville, NJ 08648 USA
T +1 937.435.3870 E info@gs1us.org W www.gs1us.org

FOLLOW US:



© 2014 GS1 US ALL RIGHTS RESERVED