



The Global Language of Business

# GS1 US EPCIS Recommendations for FSMA 204 Critical Tracking Events

*Release 1.0, March 12 2024*



# Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>4</b>
1.1	How to Use This Document.....	5
1.2	Concepts in Example EPCIS Data .....	6
<b>2</b>	<b>Harvest CTE .....</b>	<b>8</b>
<b>3</b>	<b>Cooling CTE.....</b>	<b>12</b>
<b>4</b>	<b>Initial Packing CTE.....</b>	<b>18</b>
<b>5</b>	<b>Transformation CTE .....</b>	<b>27</b>
<b>6</b>	<b>Shipping CTE.....</b>	<b>31</b>
<b>7</b>	<b>Receiving CTE .....</b>	<b>36</b>
<b>8</b>	<b>First Land-Based Receiver CTE.....</b>	<b>41</b>
<b>9</b>	<b>Alternative EPCIS Data Formats .....</b>	<b>45</b>
<b>10</b>	<b>Additional Resources.....</b>	<b>46</b>



## 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 help 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 (EPC®)-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®).

## About Foodservice GS1 US Standards Initiative

The Foodservice GS1 US Standards Initiative serves as a strategic effort in which industry trade associations and individual companies may choose to join on a voluntary basis to assist with their company's adoption and implementation of GS1 Standards. Nothing herein should be construed as constituting or implying an agreement among foodservice companies to adopt or implement GS1 Standards. Nothing herein should be construed as constituting or implying an agreement regarding any company's prices, output, markets, or dealings with customers and suppliers. Nothing herein is inconsistent with the proposition that each participating company must and will exercise its independent business judgment on all standards adoption.

## Document Summary

Document Item	Current Value
<b>Document Title</b>	EPCIS Recommendations for FSMA 204 Critical Tracking Events
<b>Date Last Modified</b>	March 12, 2024
<b>Document Description</b>	This document supplements the Retail Grocery and Foodservice Application of GS1 System of Standards to Support FSMA 204 Guideline and seeks to show how the EPCIS standard could be leveraged to capture certain supply chain events and what information from those events can be used to supplement the needed data for FSMA 204 CTEs (Critical Tracking Events) and KDEs (Key Data Elements).

# 1 Introduction

In July 2020, the FDA announced its 10-year plan to improve food safety, [The New Era of Smarter Food Safety](https://www.fda.gov/food/new-era-smarter-food-safety). This is a framework to “respond more rapidly to outbreaks, address new business models, reduce contamination of food, and foster the development of food safety cultures.” It encourages the use of technology, improved traceability, and establishes a food safety culture throughout all members of the supply chain. For more information go to: <https://www.fda.gov/food/new-era-smarter-food-safety>.

On November 21, 2022, the United States Food and Drug Administration (FDA) published a Final Rule titled, Requirements for Additional Traceability Records for Certain Foods, which is a key component of the FDA’s New Era of Smarter Food Safety Blueprint and implements Section 204(d) of the FDA Food Safety Modernization Act (FSMA), which was signed into law in 2011. This rule is commonly referred to as “FSMA 204”. Throughout the remainder of this document, ‘Final Rule’ and FSMA 204 will be used interchangeably as shorthand for referring to this regulation.

EPCIS (Electronic Product Code Information Services) is the flagship data capture and sharing standard from GS1 specifically developed for enabling full supply chain visibility both inside organizations and between trading partners. It does so by providing a framework to model events that occur in supply chains as they truly happen, including “what” supply chain objects are involved, “where” and “when” the events take place, and “why” the events occurred, such as the business process, related transaction documents, and more.

This document seeks to show how the EPCIS standard could be leveraged to capture certain supply chain events and what information from those events can be used to supplement the needed data for FSMA 204 CTEs (Critical Tracking Events) and KDEs (Key Data Elements). Each of the FSMA 204 CTEs are represented in this document with links to accompanying EPCIS example data. The FSMA 204 CTEs are the following:

- Harvest
- Cooling
- Initial Packing
- Transformation
- Shipping
- Receiving
- First Land-Based Receiver

## 1.1 How to Use This Document

When reviewing sections of this document that are directly related to providing example EPCIS event data, these specific sections contain the following information:

- Which FSMA 204 CTE the section covers
- A description of the provided event data and how it models data that can be used to provide the necessary KDEs each CTE requires.
- EPCIS 2.0 JSON format event data examples that represent captured supply chain events related to FSMA 204 CTEs and KDEs

Mapping tables describing each FSMA 204 KDE for each CTE and corresponding EPCIS event fields and field value types.

## 1.2 Concepts in Example EPCIS Data

The EPCIS standard is designed to capture when and where supply chain objects are involved in many different processes, including when they are created and when they are transferred between trading partners and locations. When reviewing data requirements for FSMA 204 CTEs and KDEs in the context of EPCIS, it is important to understand what KDEs might be captured in a single EPCIS event rather than two or more EPCIS events.

Depending on the CTE, the full list of KDEs required could be associated with multiple supply chain processes, and therefore would best be captured with multiple EPCIS events.

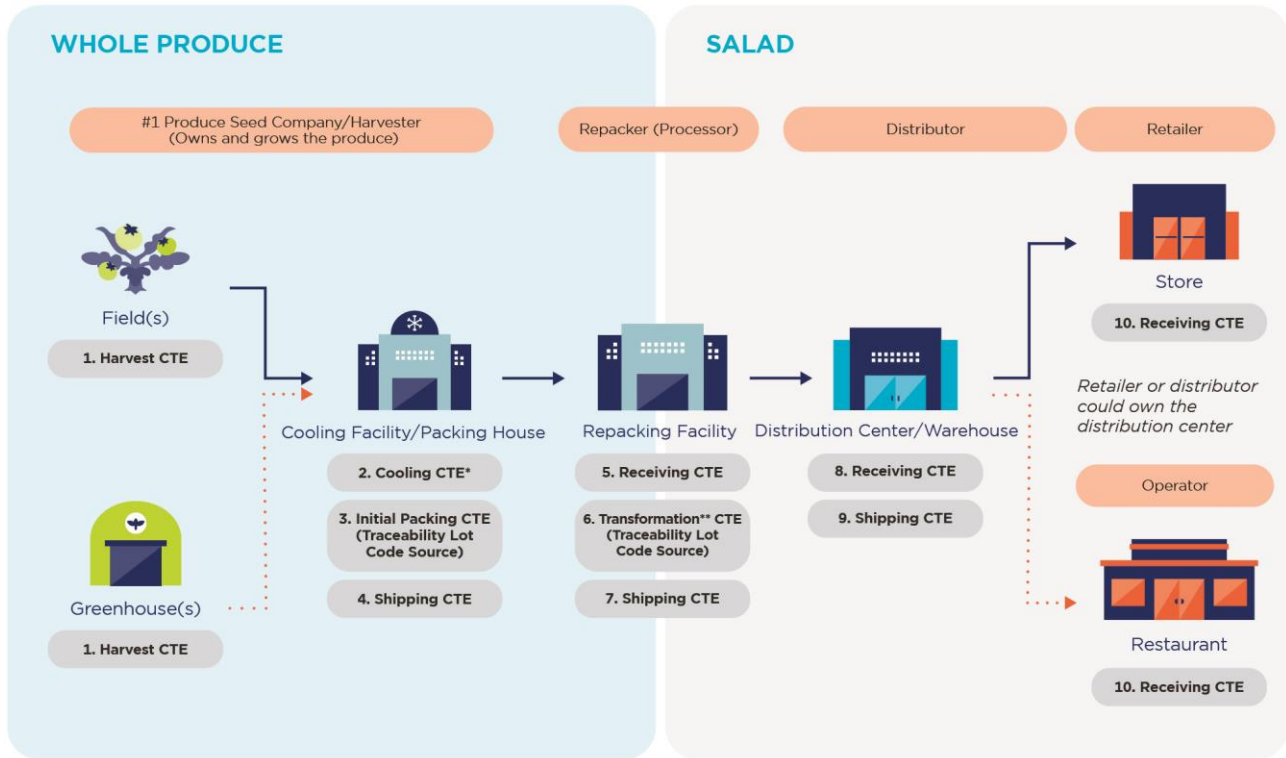
One example of this concept that will be shown here will be the EPCIS example that could support the data requirements for a Harvest CTE. As outlined in the [Final Rule Subpart S – Additional Traceability Records for Certain Foods](#), for the Harvest CTE, the following Key Data Elements must be captured:

- Commodity and, if applicable, variety of the food
- Quantity and unit of measure of the food
- Location description for the farm where the food was harvested
- For produce:
  - Name of the field or other growing area from which the food was harvested (must correspond to the name used by the grower), or
  - Other information identifying the harvest location at least as precisely as field or growing area name
- For aquacultured food:
  - Name of the container (e.g., pond, pool, tank, cage) from which the food was harvested (must correspond to the container name used by the aquaculture farmer), or
  - Other information identifying the harvest location at least as precisely as the container name
- Date of harvesting
- Reference document type and reference document number
- Location description for the immediate subsequent recipient (other than a transporter) of the food

Most of this required information will be captured during the harvesting of new food that will be introduced into the supply chain. However, the final KDE in the list above for detailing the capturing of the next recipient of the food implies a post-harvest transfer of the food to this location. In EPCIS, this would translate to representing this data with one EPCIS event documenting the harvesting of the food, and an immediate follow-up EPCIS event detailing the transfer of the food to the next recipient per the rule.

In the graphic below showing the flow of whole produce from the harvesting of the produce to final receiving at a retailer, the Harvest CTE encompasses the harvest itself at the field and/or greenhouse locations, as well as the solid/dotted lines indicating a transfer of the newly harvested produce to the immediate subsequent recipient, which would be a cooling/packing location.

To summarize, the EPCIS examples shown in this document illustrate a concept of gathering EPCIS event data captured during processes where supply chain objects are either created or transferred to a new location and assembling them together for data needed in a FSMA 204 CTE.



\*\*Transformation could occur over 1 or more steps

## 2 Harvest CTE

The EPCIS JSON document below provides example EPCIS visibility event data that could be captured in support of a FSMA 204 Harvest CTE for raw agricultural commodities not obtained from a fishing vessel.

The document is constructed with two EPCIS events that provide the traceability data outlined in the Harvest CTE description.

The first of these events describes the harvest process KDEs required by the FSMA 204 rule, such as the location of the harvest, harvest date, reference documents, and commodity identifier, and is indicated by the business step value of `'creating_class_instance'`.

The second of these events describes a capturing of the newly harvested food being transferred from the harvest location to an immediate subsequent recipient, which is another KDE required by the U.S. FDA for the Harvest CTE. This is indicated in the event with the business step value of `'transporting'`.

All mappings of KDEs required to be gathered for the Harvest CTE to EPCIS event fields are described in the mapping table following the JSON example.



**Note:** In the EPCIS example for this CTE, the identifiers for the harvested commodities are of a GTIN + Batch/Lot canonical Digital Link. It is noted that the Harvest CTE per FSMA 204 only requires commodity and, if applicable, variety level identification of food in this CTE, but this guidance recommends using an identifier with a trade item and a batch/lot back to the harvest whenever possible to ensure that during a traceability request, food that is initially packed can more thoroughly be associated to a harvest from a particular date and location.



```
{
  "@context": [
    "https://ref.gs1.org/standards/epcis/2.0.0/epcis-context.jsonld"
  ],
  "type": "EPCISDocument",
  "schemaVersion": "2.0",
  "creationDate": "2023-10-25T17:02:27.452Z",
  "epcisBody": {
    "eventList": [
      { //EPCIS event capturing the harvesting of the food
        "type": "ObjectEvent",
        "eventTime": "2023-10-24T00:00:00-04:00",
        "recordTime": "2023-10-24T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:32e4e2a2-5794-4315-9962-9b05979ad01f",
        "action": "ADD",
        "bizStep": "creating_class_instance",
        "disposition": "active",
        "readPoint": {
          "id": "https://id.gs1.org/414/9521234560005"
        },
        "bizLocation": {
          "id": "https://id.gs1.org/414/9521234560005"
        },
        "bizTransactionList": [
          {
            "type": "prodorder",
            "bizTransaction": "urn:epcglobal:cbv:bt:9521234560005:5555"
          }
        ],
        "quantityList": [
          {
            "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
            "quantity": 1000,
            "uom": "LBR"
          }
        ]
      },
      { //EPCIS event capturing the transferring of the food to immediate subsequent recipient
        "type": "ObjectEvent",
        "eventTime": "2023-10-25T00:00:00-04:00",
        "recordTime": "2023-10-25T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:3e131a0f-e919-4615-b0dc-e7441c0cc3f3",
      }
    ]
  }
}
```

```
"action": "OBSERVE",
"bizStep": "transporting",
"disposition": "in_transit",
"readPoint": {
  "id": "https://id.gs1.org/414/9521234560005"
},
"quantityList": [
  {
    "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
    "quantity": 1000,
    "uom": "LBR"
  }
],
"sourceList": [
  {
    "type": "owning_party",
    "source": "https://id.gs1.org/417/9521234572220"
  }
],
"destinationList": [
  {
    "type": "location",
    "destination": "https://id.gs1.org/414/9521234560111"
  }
]
}
]
}
}
```

**Harvest KDE Mapping Table**

FSMA 204 Harvest KDE	EPCIS Event Business Step	EPCIS Event Field	EPCIS Event Field Value Type
Location description for the farm where the food was harvested	creating_class_instance	readPoint	Location GLN*
Commodity and, if applicable, variety of the food	creating_class_instance	quantityList, epcClass	GTIN**
Quantity of the food	creating_class_instance	quantityList, quantity	xsd:double
Unit of Measure	creating_class_instance	quantityList, uom	UOM
Date of harvesting	creating_class_instance	eventTime	xsd:dateTimeStamp
Reference document type	creating_class_instance	bizTransactionList, type	BusinessTransactionTypeID
Reference document number	creating_class_instance	bizTransactionList, bizTransaction	BusinessTransactionID
Location description for the immediate subsequent recipient (other than a transporter) of the food	transporting	destinationList, destination, type = location	Location GLN*
Business Name, Phone Number	transporting	sourceList, source, type = owning_party	Party GLN*

\* The location and party GLNs serve as the location and party identifiers for EPCIS event data. Specific location and party details would be considered master data of these identifiers and exchanged outside the EPCIS event data.

\*\* The GTIN serves as the commodity identifier for EPCIS event data. For the Commodity KDE, this guidance recommends utilizing the importClassificationTypeCode and importClassificationValue attributes supplemented by the functionalName attribute. This set of attributes can be further augmented by the gpcCategoryCode which is an attribute for expressing the GS1 Global Product Classification (GPC) code value, a product classification scheme already required by GDSN and GDM. These attributes would be considered the master data of the EPCIS identifier.

### 3 Cooling CTE

The EPCIS JSON document below provides example EPCIS visibility event data that could be captured in support of a FSMA 204 Cooling CTE for raw agricultural commodities not obtained from a fishing vessel.

The document is constructed with four EPCIS events that provide the traceability data outlined in the Cooling CTE description.

The first event describes the harvested food being received at the cooling facility and the farm from which the food came from. This is indicated in the event by the business step value of 'receiving'.

The second and third events describe the cooling process KDEs required by the FSMA 204 rule, including when the previously harvested commodity, quantity and UOM of such, enter and exit the cooling location within the cooling facility. The business step of 'arriving' is used to indicate that the food is entering the specific cooling location in the cooling facility, and the business step of 'departing' is used to indicate that the food is being removed from the specific cooling location in the cooling facility. With EPCIS 2.0, optional sensor-based temperature information could also be provided in these events to detail the temperature of the cooling location at the start and end of the cooling process.

The fourth of these events describes a capturing of the cooled food being transferred from the cooling location to an immediate subsequent recipient. This is indicated in the event with a business step of 'transporting'.

All mappings of KDEs required to be gathered for the Cooling CTE to EPCIS event fields are described in the mapping table following the JSON example.

```
{
  "@context": [
    "https://ref.gs1.org/standards/epcis/2.0.0/epcis-context.jsonld"
  ],
  "type": "EPCISDocument",
  "schemaVersion": "2.0",
  "creationDate": "2023-10-27T17:02:27.452Z",
  "epcisBody": {
    "eventList": [
      { //EPCIS event capturing food being received at cooling facility
        "type": "ObjectEvent",
        "eventTime": "2023-10-25T00:00:00-04:00",
        "recordTime": "2023-10-25T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:d5029150-5ce9-4ca2-a301-df6c786ddb6a",
        "action": "OBSERVE",
        "bizStep": "receiving",
        "disposition": "in_progress",
        "readPoint": {
          "id": "https://id.gs1.org/414/9521234560111"
        },
        "bizLocation": {
          "id": "https://id.gs1.org/414/9521234560111"
        },
        "bizTransactionList": [
          {
            "type": "recadv",
            "bizTransaction": "urn:epcglobal:cbv:bt:9521234560111:861-100037169"
          }
        ],
        "quantityList": [
          {
            "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
            "quantity": 1000,
            "uom": "LBR"
          }
        ],
        "sourceList": [
          {
            "type": "owning_party",
            "source": "https://id.gs1.org/417/9521234572220"
          },
          {
            "type": "location",

```

```
        "source": "https://id.gs1.org/414/9521234560005"
      }
    ],
    "destinationList": [
      {
        "type": "location",
        "destination": "https://id.gs1.org/414/9521234560005"
      }
    ]
  },
  { //EPCIS event capturing food entering cooling location in facility
    "type": "ObjectEvent",
    "eventTime": "2023-10-26T00:00:00-04:00",
    "recordTime": "2023-10-26T00:00:00-04:00",
    "eventTimeZoneOffset": "-04:00",
    "eventID": "urn:uuid:17f33eac-7abd-4a39-b64c-683746572a35",
    "action": "OBSERVE",
    "bizStep": "arriving",
    "disposition": "in_progress",
    "readPoint": {
      "id": "https://id.gs1.org/414/9521234560111/254/12345"
    },
    "bizLocation": {
      "id": "https://id.gs1.org/414/9521234560111"
    },
    "quantityList": [
      {
        "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
        "quantity": 1000,
        "uom": "LBR"
      }
    ]
  },
  { //EPCIS event capturing food exiting cooling location in facility
    "type": "ObjectEvent",
    "eventTime": "2023-10-27T00:00:00-04:00",
    "recordTime": "2023-10-27T00:00:00-04:00",
    "eventTimeZoneOffset": "-04:00",
    "eventID": "urn:uuid:8dff1b82-e7b6-4db6-ac1b-de1d87bbde69",
    "action": "OBSERVE",
    "bizStep": "departing",
    "disposition": "in_progress",
    "readPoint": {
      "id": "https://id.gs1.org/414/9521234560111/254/12345"
    }
  }
}
```

```
    },
    "bizLocation": {
      "id": "https://id.gs1.org/414/9521234560111"
    },
    "quantityList": [
      {
        "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
        "quantity": 1000,
        "uom": "LBR"
      }
    ]
  },
  { //EPCIS event capturing food being transferred to immediate subsequent recipient
    "type": "ObjectEvent",
    "eventTime": "2023-10-27T00:00:00-04:00",
    "recordTime": "2023-10-27T00:00:00-04:00",
    "eventTimeZoneOffset": "-04:00",
    "eventID": "urn:uuid:e43bfcf2-b383-4042-b82a-48e3748c612d",
    "action": "OBSERVE",
    "bizStep": "transporting",
    "disposition": "in_transit",
    "readPoint": {
      "id": "https://id.gs1.org/414/9521234560111"
    },
    "quantityList": [
      {
        "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
        "quantity": 1000,
        "uom": "LBR"
      }
    ],
    "sourcelist": [
      {
        "type": "location",
        "source": "https://id.gs1.org/414/9521234560111"
      }
    ],
    "destinationList": [
      {
        "type": "location",
        "destination": "https://id.gs1.org/414/9520244560128"
      }
    ]
  }
}
```

]
}
}



**Cooling KDE Mapping Table**

<b>FSMA 204 Cooling KDE</b>	<b>EPCIS Event Business Step</b>	<b>EPCIS Event Field</b>	<b>EPCIS Event Field Value Type</b>
Location description for the farm where the food was harvested	receiving	sourceList, source	Location GLN*
Commodity and, if applicable, variety of the food	receiving, arriving, departing, transporting	quantityList, epcClass	GTIN**
Quantity of the food	receiving, arriving, departing, transporting	quantityList, quantity	xsd:double
Unit of Measure	receiving, arriving, departing, transporting	quantityList, uom	UOM
Date of cooling	receiving, arriving, departing	eventTime	xsd:dateTimeStamp
Location description for where you cooled the food	receiving, arriving, departing, transporting	readPoint	Location GLN*
Reference document type	receiving	bizTransactionList, type	BusinessTransactionTypeID
Reference document number	receiving	bizTransactionList, bizTransaction	BusinessTransactionID
Location description for the immediate subsequent recipient (other than a transporter) of the food	transporting	destinationList, destination, type = location	Location GLN*

\* The location GLN serves as the location identifier for EPCIS event data. Specific location details would be considered master data of this identifier and exchanged outside the EPCIS event data.

\*\* The GTIN serves as the commodity identifier for EPCIS event data. For the Commodity KDE, this guidance recommends utilizing the importClassificationTypeCode and importClassificationValue attributes supplemented by the functionalName attribute. This set of attributes can be further augmented by the gpcCategoryCode which is an attribute for expressing the GS1 Global Product Classification (GPC) code value, a product classification scheme already required by GDSN and GDM. These attributes would be considered the master data of the EPCIS identifier.

## 4 Initial Packing CTE

The EPCIS JSON document below provides example EPCIS visibility event data that could be captured in support of a FSMA 204 Initial Packing CTE for raw agricultural commodities not obtained from a fishing vessel.

The document is constructed with all EPCIS events previously described for harvesting and cooling (FSMA 204 requires this data to be provided to the initial packer except for reference documents), as well as a receiving EPCIS event detailing the date the food was received by the initial packer, indicated by the business step value of 'receiving', and a Transformation type event modelling the packing of the raw commodity and the assignment of a Traceability Lot Code, indicated by the business step value of 'creating\_class\_instance'.

All mappings of KDEs required to be gathered for the Initial Packing CTE to EPCIS event fields are described in the mapping table following the JSON example.

```
{
  "@context": [
    "https://ref.gs1.org/standards/epcis/2.0.0/epcis-context.jsonld"
  ],
  "type": "EPCISDocument",
  "schemaVersion": "2.0",
  "creationDate": "2023-10-29T17:02:27.452Z",
  "epcisBody": {
    "eventList": [
      { //Start of previously provided Harvest CTE events
        "type": "ObjectEvent",
        "eventTime": "2023-10-24T00:00:00-04:00",
        "recordTime": "2023-10-24T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:32e4e2a2-5794-4315-9962-9b05979ad01f",
        "action": "ADD",
        "bizStep": "creating_class_instance",
        "disposition": "active",
        "readPoint": {
          "id": "https://id.gs1.org/414/9521234560005"
        },
        "bizLocation": {
          "id": "https://id.gs1.org/414/9521234560005"
        },
        "quantityList": [
          {
            "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
            "quantity": 1000,
            "uom": "LBR"
          }
        ]
      },
      {
        "type": "ObjectEvent",
        "eventTime": "2023-10-25T00:00:00-04:00",
        "recordTime": "2023-10-25T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:3e131a0f-e919-4615-b0dc-e7441c0cc3f3",
        "action": "OBSERVE",
        "bizStep": "transporting",
        "disposition": "in_transit",
        "readPoint": {
          "id": "https://id.gs1.org/414/9521234560005"
        }
      },

```

```
"quantityList": [  
  {  
    "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",  
    "quantity": 1000,  
    "uom": "LBR"  
  }  
],  
"sourcelist": [  
  {  
    "type": "owning_party",  
    "source": "https://id.gs1.org/417/9521234572220"  
  },  
  {  
    "type": "location",  
    "source": "https://id.gs1.org/414/9521234560005"  
  }  
],  
"destinationList": [  
  {  
    "type": "location",  
    "destination": "https://id.gs1.org/414/9521234560111"  
  }  
]  
},  
{ //Start of previously provided Cooling CTE events  
  "type": "ObjectEvent",  
  "eventTime": "2023-10-25T00:00:00-04:00",  
  "recordTime": "2023-10-25T00:00:00-04:00",  
  "eventTimeZoneOffset": "-04:00",  
  "eventID": "urn:uuid:d5029150-5ce9-4ca2-a301-df6c786ddb6a",  
  "action": "OBSERVE",  
  "bizStep": "receiving",  
  "disposition": "in_progress",  
  "readPoint": {  
    "id": "https://id.gs1.org/414/9521234560111"  
  },  
  "bizLocation": {  
    "id": "https://id.gs1.org/414/9521234560111"  
  },  
  "quantityList": [  
    {  
      "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",  
      "quantity": 1000,  
      "uom": "LBR"  
    }  
  ]  
}
```

```
    }
  ],
  "sourceList": [
    {
      "type": "owning_party",
      "source": "https://id.gs1.org/417/9521234572220"
    },
    {
      "type": "location",
      "source": "https://id.gs1.org/414/9521234560005"
    }
  ],
  "destinationList": [
    {
      "type": "location",
      "destination": "https://id.gs1.org/414/9521234560111"
    }
  ]
},
{
  "type": "ObjectEvent",
  "eventTime": "2023-10-26T00:00:00-04:00",
  "recordTime": "2023-10-26T00:00:00-04:00",
  "eventTimeZoneOffset": "-04:00",
  "eventID": "urn:uuid:17f33eac-7abd-4a39-b64c-683746572a35",
  "action": "OBSERVE",
  "bizStep": "arriving",
  "disposition": "in_progress",
  "readPoint": {
    "id": "https://id.gs1.org/414/9521234560111/254/12345"
  },
  "bizLocation": {
    "id": "https://id.gs1.org/414/9521234560111"
  },
  "quantityList": [
    {
      "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
      "quantity": 1000,
      "uom": "LBR"
    }
  ]
},
{
  "type": "ObjectEvent",
```

```
"eventTime": "2023-10-27T00:00:00-04:00",
"recordTime": "2023-10-27T00:00:00-04:00",
"eventTimeZoneOffset": "-04:00",
"eventID": "urn:uuid:8dff1b82-e7b6-4db6-ac1b-de1d87bbde69",
"action": "OBSERVE",
"bizStep": "departing",
"disposition": "in_progress",
"readPoint": {
  "id": "https://id.gs1.org/414/9521234560111/12345"
},
"bizLocation": {
  "id": "https://id.gs1.org/414/9521234560111"
},
"quantityList": [
  {
    "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
    "quantity": 1000,
    "uom": "LBR"
  }
]
},
{
  "type": "ObjectEvent",
  "eventTime": "2023-10-27T00:00:00-04:00",
  "recordTime": "2023-10-27T00:00:00-04:00",
  "eventTimeZoneOffset": "-04:00",
  "eventID": "urn:uuid:e43bfcf2-b383-4042-b82a-48e3748c612d",
  "action": "OBSERVE",
  "bizStep": "transporting",
  "disposition": "in_transit",
  "readPoint": {
    "id": "https://id.gs1.org/414/9521234560111"
  },
  "quantityList": [
    {
      "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
      "quantity": 1000,
      "uom": "LBR"
    }
  ],
  "sourceList": [
    {
      "type": "location",
      "source": "https://id.gs1.org/414/9521234560111"
    }
  ]
}
```

```
    }
  ],
  "destinationList": [
    {
      "type": "location",
      "destination": "https://id.gs1.org/414/9520244560128"
    }
  ]
},
{ //EPCIS event capturing the receiving of food at packing location
  "type": "ObjectEvent",
  "eventTime": "2023-10-28T00:00:00-04:00",
  "recordTime": "2023-10-28T00:00:00-04:00",
  "eventTimeZoneOffset": "-04:00",
  "eventID": "urn:uuid:9e646956-f352-499a-a3c5-1fb46833fa02",
  "action": "OBSERVE",
  "bizStep": "receiving",
  "disposition": "in_progress",
  "readPoint": {
    "id": "https://id.gs1.org/414/9520244560128"
  },
  "bizLocation": {
    "id": "https://id.gs1.org/414/9520244560128"
  },
  "quantityList": [
    {
      "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
      "quantity": 1000,
      "uom": "LBR"
    }
  ],
  "sourcelist": [
    {
      "type": "location",
      "source": "https://id.gs1.org/414/9521234560111"
    }
  ],
  "destinationList": [
    {
      "type": "location",
      "destination": "https://id.gs1.org/414/9520244560128"
    }
  ]
},
```

```
{ //EPCIS event capturing creation of Traceability Lot Code
  "type": "TransformationEvent",
  "eventTime": "2023-10-29T00:00:00-04:00",
  "recordTime": "2023-10-29T00:00:00-04:00",
  "eventTimeZoneOffset": "-04:00",
  "eventID": "urn:uuid:3ca7044a-7e8f-4136-b4f2-cbfed5c797bc",
  "inputQuantityList": [
    {
      "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
      "quantity": 1000,
      "uom": "LBR"
    }
  ],
  "outputQuantityList": [
    {
      "epcClass": "https://id.gs1.org/01/19522224560224/10/abc1234",
      "quantity": 500,
      "uom": "CS"
    }
  ],
  "bizStep": "creating_class_instance",
  "disposition": "active",
  "readPoint": {
    "id": "https://id.gs1.org/414/9520244560128"
  },
  "bizLocation": {
    "id": "https://id.gs1.org/414/9520244560128"
  },
  "bizTransactionList": [
    {
      "type": "prodorder",
      "bizTransaction": "urn:epcglobal:cbv:bt:9520244560128:55555"
    }
  ]
}
```



**Initial Packing KDE Mapping Table**

<b>FSMA 204 Initial Packing KDE</b>	<b>EPCIS Event Business Step</b>	<b>EPCIS Event Field</b>	<b>EPCIS Event Field Value Type</b>
Harvesting KDEs	See Harvest CTE	See Harvest CTE	See Harvest CTE
Cooling KDEs	See Cooling CTE	See Cooling CTE	See Cooling CTE
Date you received the food	receiving	eventTime	xsd:dateTimeStamp
Quantity of food received	receiving	quantityList, quantity	xsd:double
Unit of Measure of food received	receiving	quantityList, uom	UOM
Quantity of the packed food	creating_class_instance	inputQuantityList, quantity	xsd:double
Unit of Measure of the packed food	creating_class_instance	inputQuantityList, uom	UOM
Date of initial packing	creating_class_instance	eventTime	xsd:dateTimeStamp
Location description for where you initially packed the food (i.e., traceability lot code source), and (if applicable), the traceability lot code source reference	creating_class_instance	readPoint	Location GLN*
Commodity and, if applicable, variety of the food received	receiving	quantityList, epcClass	GTIN**
Traceability lot code you assigned	creating_class_instance	outputQuantityList, epcClass	GTIN + Batch/Lot**
Product Description of the packed food	creating_class_instance	outputQuantityList, epcClass	GTIN**

FSMA 204 Initial Packing KDE	EPCIS Event Business Step	EPCIS Event Field	EPCIS Event Field Value Type
Reference document type	creating_class_instance	bizTransactionList, type	BusinessTransactionTypeID
Reference document number	creating_class_instance	bizTransactionList, bizTransaction	BusinessTransactionID

\* The location GLN serves as the location identifier for EPCIS event data. Specific location details would be considered master data of this identifier and exchanged outside the EPCIS event data.

\*\* The GTIN and GTIN + Batch/Lot serve as the commodity identifier and Traceability Lot Code identifier of packed food for EPCIS event data. For the Commodity KDE, this guidance recommends utilizing the importClassificationTypeCode and importClassificationValue attributes supplemented by the functionalName attribute. This set of attributes can be further augmented by the gpcCategoryCode which is an attribute for expressing the GS1 Global Product Classification (GPC) code value, a product classification scheme already required by GDSN and GDM. The product description of the packed food can be accessed by a lookup of the GTIN component of the GTIN + Batch/Lot identifier used for the Traceability Lot Code.

## 5 Transformation CTE

The EPCIS document below provides example EPCIS visibility event data that could be captured in support of a FSMA 204 Transformation CTE.

The document models the transformation of food used as ingredients into newly produced food from those ingredients. It is comprised of a single EPCIS event, which details the date and location of the transformation, the traceability lot codes of each of the ingredient foods, the traceability lot code of the new food, and the quantities and unit of measures of all ingredients and the new food.

All mappings of KDEs required to be gathered for the Transformation CTE to EPCIS event fields are described in the mapping table following the JSON example.

```
{
  "@context": [
    "https://ref.gs1.org/standards/epcis/2.0.0/epcis-context.jsonld",
    {
      "gs1:bestBeforeDate": {"@type": "xsd:date"}
    }
  ],
  "type": "EPCISDocument",
  "schemaVersion": "2.0",
  "creationDate": "2023-09-14T11:30:47.022Z",
  "epcisBody": {
    "eventList": [
      { //Event for transforming ingredient food into new food
        "type": "TransformationEvent",
        "eventTime": "2023-10-31T00:00:00-04:00",
        "recordTime": "2023-10-31T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "inputQuantityList": [ //Foods used as ingredients
          {
            "epcClass": "https://id.gs1.org/01/19522224560224/10/abc1234",
            "quantity": 100,
            "uom": "CS"
          },
          {
            "epcClass": "https://id.gs1.org/01/19522224560323/10/abc1234",
            "quantity": 100,
            "uom": "CS"
          },
          {
            "epcClass": "https://id.gs1.org/01/19522224560422/10/abc1234",
            "quantity": 100,
            "uom": "CS"
          }
        ],
        "outputQuantityList": [ //New food produced
          {
            "epcClass": "https://id.gs1.org/01/19522224512353/10/abc1234",
            "quantity": 100,
            "uom": "CS"
          }
        ],
        "bizStep": "creating_class_instance",
        "disposition": "active",
        "readPoint": {
```

```
    "id": "https://id.gs1.org/414/9522224512356"
  },
  "bizLocation": {
    "id": "https://id.gs1.org/414/9522224512356"
  },
  "bizTransactionList": [
    {
      "type": "prodorder",
      "bizTransaction": "urn:epcglobal:cbv:bt:9520244560128:55555"
    }
  ],
  "ilmd": {
    "gs1:bestBeforeDate": "2023-09-10"
  }
}
]
```

**Transformation KDE Mapping Table**

<b>FSMA 204 Transformation KDE</b>	<b>EPCIS Event Business Step</b>	<b>EPCIS Event Field</b>	<b>EPCIS Event Field Value Type</b>
<b>KDEs for food used as ingredients</b>			
Traceability lot code for the food	creating_class_instance	inputQuantityList, epcClass	GTIN + Batch/Lot**
Product description for the food to which the traceability lot code applies	creating_class_instance	inputQuantityList, epcClass	GTIN**
For each traceability lot used, the quantity and unit of measure of the food used from that lot	creating_class_instance	quantityList, quantity, uom	xsd:double, UOM
<b>KDEs for new food produced</b>			
New traceability lot code for the food	creating_class_instance	outputQuantityList, epcClass	GTIN + Batch/Lot**
Location description for where you transformed the food (i.e., the traceability lot code source), and (if applicable) the traceability lot code source reference	creating_class_instance	readPoint	Location GLN*
Date transformation was completed	creating_class_instance	eventTime	xsd:dateTimeStamp
Product description for the food	creating_class_instance	outputQuantityList, epcClass	GTIN + Batch/Lot**
Quantity and unit of measure of the food	creating_class_instance	outputQuantityList, quantity, uom	xsd:double, UOM
Reference document type	creating_class_instance	bizTransactionList, type	BusinessTransactionTypeID
Reference document number	creating_class_instance	bizTransactionList, bizTransaction	BusinessTransactionID

\* The location GLN serves as the location identifier for EPCIS event data. Specific location details would be considered master data of this identifier and exchanged outside the EPCIS event data.

\*\* The GTIN + Batch/Lot serves as the Traceability Lot Code identifier of ingredient and transformed foods for EPCIS event data. The product description of the food can be accessed by a lookup of the GTIN component of the GTIN + Batch/Lot identifier used for the Traceability Lot Code. By utilizing the GTIN as a part of the *Traceability Lot Code* KDE, companies can link to the other channels they are already utilizing for exchanging attributes with trading partners which describe food products. The GTIN can act as the bridge between the two different data sets when pulling together for an U.S. FDA request under the Final Rule.

## 6 Shipping CTE

The EPCIS document below provides example EPCIS visibility event data that could be captured in support of a FSMA 204 Shipping CTE.

The document models the shipping of three distinct Traceability Lot Codes to a downstream recipient. It consists of two chronologically ordered EPCIS events.

The first EPCIS event provides previously captured details of the origins of one of three shipped Traceability Lot Codes, covering the requirement of including the Traceability Lot Code Source Reference for the Shipping CTE. This event data can be a version of the initial packing event with any sensitive information redacted that is not required by the FSMA 204 to be included in the Shipping CTE. For brevity, only one of the three Traceability Lot Code creation events is included.

The second EPCIS event models the shipping of a specified amount of the three Traceability Lot Codes to a downstream location. Two of the Traceability Lot Codes are of the same GTIN, but different Batch/Lots, and the third is of a different GTIN and Batch/Lot than the first two. This event also references an SSCC that the Traceability Lot Codes are said to be contained in for transport, such as a pallet, and this example assumes and expects that a previous aggregation step has established the parent-child relationship of the SSCC and the Traceability Lot Codes.

All mappings of KDEs required to be gathered for the Shipping CTE to EPCIS event fields are described in the mapping table following the JSON example.

```
{
  "@context": [
    "https://ref.gs1.org/standards/epcis/2.0.0/epcis-context.jsonld"
  ],
  "type": "EPCISDocument",
  "schemaVersion": "2.0",
  "creationDate": "2023-11-02T20:36:49.005Z",
  "epcisBody": {
    "eventList": [
      { //EPCIS event including TLC Source Reference of a shipped TLC
        "type": "TransformationEvent",
        "eventTime": "2023-11-01T00:00:00-04:00",
        "recordTime": "2023-11-01T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:4898a223-216a-4f46-9e18-338ccf6fa3ba",
        "inputQuantityList": [
          {
            "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
            "quantity": 250,
            "uom": "LBR"
          }
        ],
        "outputQuantityList": [
          {
            "epcClass": "https://id.gs1.org/01/19522224560224/10/abc1234",
            "quantity": 25,
            "uom": "CS"
          }
        ],
        "bizStep": "creating_class_instance",
        "disposition": "active",
        "readPoint": {
          "id": "https://id.gs1.org/414/9520244560128"
        },
        "bizLocation": {
          "id": "https://id.gs1.org/414/9520244560128"
        }
      },
      { //EPCIS event capturing the shipping of three TLCs
        "type": "AggregationEvent",
        "eventTime": "2023-11-02T00:00:00-04:00",
        "recordTime": "2023-11-02T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:49afe832-5171-432d-99c4-6dc003255ee1",
      }
    ]
  }
}
```



```
"parentID": "https://id.gs1.org/00/095202445601288457",
"action": "OBSERVE",
"bizStep": "shipping",
"disposition": "in_transit",
"readPoint": {
  "id": "https://id.gs1.org/414/9520244564515"
},
"bizTransactionList": [
  {
    "type": "desadv",
    "bizTransaction": "urn:epcglobal:cbv:bt:9520244560128:861-100037169"
  },
  {
    "type": "bol",
    "bizTransaction": "urn:epcglobal:cbv:bt:9520244560128:861-101037170"
  }
],
"childQuantityList": [
  {
    "epcClass": "https://id.gs1.org/01/19522224560224/10/abc1234",
    "quantity": 25,
    "uom": "CS"
  },
  {
    "epcClass": "https://id.gs1.org/01/19522224560224/10/abc5678",
    "quantity": 25,
    "uom": "CS"
  },
  {
    "epcClass": "https://id.gs1.org/01/19522224555558/10/abc1234",
    "quantity": 25,
    "uom": "CS"
  }
],
"sourceList": [
  {
    "type": "location",
    "source": "https://id.gs1.org/414/9520244560128"
  }
],
"destinationList": [
  {
    "type": "location",
    "destination": "https://id.gs1.org/414/9523344564515"
```

```
}  
 ]  
 }  
 ]  
 }  
 }
```

### Shipping KDE Mapping Table

FSMA 204 Shipping KDE	EPCIS Event Business Step	EPCIS Event Field	EPCIS Event Field Value Type
Location description for the location from which you shipped the food	shipping	readPoint	Location GLN*
Traceability lot code for the food	shipping	childQuantityList, epcClass	GTIN + Batch/Lot**
Quantity and unit of measure of the food	shipping	childQuantityList, quantity, uom	xsd:double, UOM
Product description for the food	shipping	childQuantityList, epcClass	GTIN + Batch/Lot**
Location description for the immediate subsequent recipient (other than a transporter) of the food	shipping	destinationList, destination, type = location	Location GLN*
Date you shipped the food	shipping	eventTime	xsd:dateTimeStamp
Location description for the traceability lot code source or the traceability lot code source reference	creating_class_instance	readPoint	Location GLN*
Reference document type	shipping	bizTransactionList, type	BusinessTransactionTypeID
Reference document number	shipping	bizTransactionList, bizTransaction	BusinessTransactionID

\* The location GLN serves as the location identifier for EPCIS event data. Specific location details would be considered master data of these identifiers and exchanged outside the EPCIS event data.

\*\* The GTIN + Batch/Lot serves as the Traceability Lot Code identifier of packed food for EPCIS event data. The product description of the packed food can be accessed by a lookup of the GTIN component of the GTIN + Batch/Lot identifier used for the Traceability Lot Code. By utilizing the GTIN as a part of the *Traceability Lot Code* KDE, companies can link to the other channels they are already utilizing for exchanging attributes with trading partners which describe food products. The GTIN can act as the bridge between the two different data sets when pulling together for an U.S. FDA request under the Final Rule.

## 7 Receiving CTE

The EPCIS JSON document below provides example EPCIS visibility event data that could be captured in support of a FSMA 204 Receiving CTE.

The document models the receiving of three distinct Traceability Lot Codes by a downstream recipient. It consists of two chronologically ordered EPCIS events.

The first EPCIS event provides previously captured details of the origins of one of three received Traceability Lot Codes, covering the requirement of including the Traceability Lot Code Source Reference for the Receiving CTE. This event data can be a version of the initial packing event with any sensitive information redacted that is not required by the FSMA 204 to be included in the Receiving CTE. For brevity, only one of the three Traceability Lot Code creation events is included.

The second EPCIS event models the receiving of a specified amount of the three Traceability Lot Codes by a downstream location. Two of the Traceability Lot Codes are of the same GTIN, but different Batch/Lots, and the third is of a different GTIN and Batch/Lot than the first two. This event also references an SSCC that the Traceability Lot Codes are said to be contained in for transport, such as a pallet, and this example assumes and expects that a previous aggregation step upstream has established the parent-child relationship of the SSCC and the Traceability Lot Codes.

All mappings of KDEs required to be gathered for the Receiving CTE to EPCIS event fields are described in the mapping table following the JSON example.

```
{
  "@context": [
    "https://ref.gs1.org/standards/epcis/2.0.0/epcis-context.jsonld"
  ],
  "type": "EPCISDocument",
  "schemaVersion": "2.0",
  "creationDate": "2023-11-02T20:36:49.005Z",
  "epcisBody": {
    "eventList": [
      { //EPCIS event including TLC Source Reference of a received TLC
        "type": "TransformationEvent",
        "eventTime": "2023-11-01T00:00:00-04:00",
        "recordTime": "2023-11-01T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:4898a223-216a-4f46-9e18-338ccf6fa3ba",
        "inputQuantityList": [
          {
            "epcClass": "https://id.gs1.org/01/99521234561111/10/abc1234",
            "quantity": 250,
            "uom": "LBR"
          }
        ],
        "outputQuantityList": [
          {
            "epcClass": "https://id.gs1.org/01/19522224560224/10/abc1234",
            "quantity": 25,
            "uom": "CS"
          }
        ],
        "bizStep": "creating_class_instance",
        "disposition": "active",
        "readPoint": {
          "id": "https://id.gs1.org/414/9520244560128"
        },
        "bizLocation": {
          "id": "https://id.gs1.org/414/9520244560128"
        }
      },
      { //EPCIS event capturing the receiving of three TLCs
        "type": "AggregationEvent",
        "eventTime": "2023-11-02T00:00:00-04:00",
        "recordTime": "2023-11-02T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "eventID": "urn:uuid:49afe832-5171-432d-99c4-6dc003255ee1",
      }
    ]
  }
}
```

```
"parentID": "https://id.gs1.org/00/095202445601288457",
"action": "OBSERVE",
"bizStep": "receiving",
"disposition": "in_progress",
"readPoint": {
  "id": "https://id.gs1.org/414/9523344564515"
},
"bizLocation": {
  "id": "https://id.gs1.org/414/9523344564515"
},
"bizTransactionList": [
  {
    "type": "recadv",
    "bizTransaction": "urn:epcglobal:cbv:bt:9523344564515:861-100037169"
  }
],
"childQuantityList": [
  {
    "epcClass": "https://id.gs1.org/01/19522224560224/10/abc1234",
    "quantity": 25,
    "uom": "CS"
  },
  {
    "epcClass": "https://id.gs1.org/01/19522224560224/10/abc5678",
    "quantity": 25,
    "uom": "CS"
  },
  {
    "epcClass": "https://id.gs1.org/01/19522224555558/10/abc1234",
    "quantity": 25,
    "uom": "CS"
  }
],
"sourceList": [
  {
    "type": "location",
    "source": "https://id.gs1.org/414/9520244560128"
  }
],
"destinationList": [
  {
    "type": "location",
    "destination": "https://id.gs1.org/414/9523344564515"
  }
]
```

```
]
}
]
}
}
```

**Receiving KDE Mapping Table**

<b>FSMA 204 Receiving KDE</b>	<b>EPCIS Event Business Step</b>	<b>EPCIS Event Field</b>	<b>EPCIS Event Field Value Type</b>
Location description for where the food was received	receiving	readPoint	Location GLN*
Date you received the food	receiving	eventTime	xsd:dateTimeStamp
Location description for the immediate previous source (other than a transporter) for the food	receiving	sourceList, source, type = location	Location GLN*
Traceability lot code for the food	receiving	childQuantityList, epcClass	GTIN + Batch/Lot**
Quantity and unit of measure of the food	receiving	childQuantityList, quantity, uom	xsd:double, UOM
Product description for the food	receiving	childQuantityList, epcClass	GTIN + Batch/Lot**
Location description for the traceability lot code source or the traceability lot code source reference	creating_class_instance	readPoint	Location GLN*
Reference document type	receiving	bizTransactionList, type	BusinessTransactionTypeID
Reference document number	receiving	bizTransactionList, bizTransaction	BusinessTransactionID

\* The location GLN serves as the location identifier for EPCIS event data. Specific location details would be considered master data of these identifiers and exchanged outside the EPCIS event data.

\*\* The GTIN + Batch/Lot serves as the Traceability Lot Code identifier of packed food for EPCIS event data. The product description of the packed food can be accessed by a lookup of the GTIN component of the GTIN + Batch/Lot identifier used for the Traceability Lot Code. By utilizing the GTIN as a part of the *Traceability Lot Code* KDE, companies can link to the other channels they are already utilizing for exchanging attributes with trading partners which describe food products. The GTIN can act as the bridge between the two different data sets when pulling together for an U.S. FDA request under the Final Rule.



---

## 8 First Land-Based Receiver CTE

The EPCIS JSON document below provides example EPCIS visibility event data that could be captured in support of a FSMA 204 First Land-Based Receiver CTE.

The document models the assigning of a Traceability Lot Code of food by a first land-based receiver. It consists of a single EPCIS event, and for the Traceability Lot Code assigned, it details required data for the FSMA 204 rule, including the date range of the food harvest and the Food and Agriculture Organization of the United Nations defined area where the food was caught.

All mappings of KDEs required to be gathered for the First Land-Based Receiver CTE to EPCIS event fields are described in the mapping table following the JSON example.

```
{
  "@context": [
    "https://ref.gs1.org/standards/epcis/2.0.0/epcis-context.jsonld",
    {
      "gs1:harvestDateStart": {"@type": "xsd:date"},
      "gs1:harvestDateEnd": {"@type": "xsd:date"}
    }
  ],
  "type": "EPCISDocument",
  "schemaVersion": "2.0",
  "creationDate": "2023-09-20T18:46:56.887Z",
  "epcisBody": {
    "eventList": [
      {
        "type": "ObjectEvent",
        "eventTime": "2023-09-20T00:00:00-04:00",
        "recordTime": "2023-09-20T00:00:00-04:00",
        "eventTimeZoneOffset": "-04:00",
        "action": "ADD",
        "bizStep": "creating_class_instance",
        "disposition": "active",
        "readPoint": {
          "id": "https://id.gs1.org/414/9521234560005"
        },
        "bizLocation": {
          "id": "https://id.gs1.org/414/9521234560005"
        },
        "bizTransactionList": [
          {
            "type": "recadv",
            "bizTransaction": "urn:epcglobal:cbv:bt:9521234560005:861-100037169"
          },
          {
            "type": "po",
            "bizTransaction": "urn:epcglobal:cbv:bt:9521234560005:861-100037170"
          },
          {
            "type": "cert",
            "bizTransaction": "urn:epcglobal:cbv:bt:9521234560005:861-100037171"
          }
        ],
        "quantityList": [
          {
            "epcClass": "https://id.gs1.org/01/99521234500028/10/abc1234",

```

```
    "quantity": 1000,  
    "uom": "LBR"  
  }  
],  
"ilmd": {  
  "cbvmda:vesselCatchInformationList": {  
    "cbvmda:vesselCatchInformation": {  
      "cbvmda:catchArea": "21.4R"  
    }  
  },  
  "gs1:harvestDateEnd": "2023-09-20",  
  "gs1:harvestDateStart": "2023-09-18"  
}  
}  
]  
}  
}
```

**First Land-Based Receiver KDE Mapping Table**

<b>FSMA 204 First Land-Based Receiver KDE</b>	<b>EPCIS Event Business Step</b>	<b>EPCIS Event Field</b>	<b>EPCIS Event Field Value Type</b>
Location description for the first land-based receiver (i.e., traceability lot code source), and (if applicable) traceability lot code source reference	creating_class_instance	readPoint	Location GLN*
Locations for the trip during which the food was caught	creating_class_instance	ilmd, catchArea	FAO Code, other
Harvest date range	creating_class_instance	ilmd, harvestDateStart, harvestDateEnd	xsd:date
Date the food was landed	creating_class_instance	eventTime	xsd:dateTimeStamp
Quantity and unit of measure of the food	creating_class_instance	childQuantityList, quantity, uom	xsd:double, UOM
Traceability lot code you assigned	creating_class_instance	childQuantityList, epcClass	GTIN + Batch/Lot**
Species and/or acceptable market name for unpackaged food, or the product description for packaged food	creating_class_instance	childQuantityList, epcClass	GTIN**
Reference document type	creating_class_instance	bizTransactionList, type	BusinessTransactionTypeID
Reference document number	creating_class_instance	bizTransactionList, bizTransaction	BusinessTransactionID

\* The location GLN serves as the location identifier for EPCIS event data. Specific location details would be considered master data of these identifiers and exchanged outside the EPCIS event data.

\*\* The GTIN + Batch/Lot serves as the Traceability Lot Code identifier assigned by the first land-based receiver in EPCIS event data. The product description of the food can be accessed by a lookup of the GTIN component of the GTIN + Batch/Lot identifier used for the Traceability Lot Code. By utilizing the GTIN as a part of the *Traceability Lot Code* KDE, companies can link to the other channels they are already utilizing for exchanging attributes with trading partners which describe food products. The GTIN can act as the bridge between the two different data sets when pulling together for an U.S. FDA request under the Final Rule.

## 9 Alternative EPCIS Data Formats

The EPCIS document examples provided in sections 2 through 8 are constructed in the JSON data format and conform to EPCIS 2.0. Support for JSON/JSON-LD is a significant addition to the EPCIS standard and was added to provide a more lightweight data format more familiar to the current generation of software development professionals as well as to enable easier integration of EPCIS data with data from other systems. EPCIS 2.0 also provides additional standard fields to include sensor-based information in a new 'How' dimension, such as temperature data that can be included in cold storage applications.

It is noted that existing implementations of EPCIS may currently use the XML data format as well as EPCIS 1.2 for use cases such as capturing data related to the DSCSA (Drug Supply Chain Security Act). All EPCIS examples listed above can be represented in XML rather than JSON. Additionally, all object and location/party identifiers in these examples leverage GS1 Digital Link URIs that are natively interoperable with GS1 element strings in barcodes. These can be used in place of traditional EPC URNs in EPCIS 2.0 format events.

The GS1 EPCIS Sandbox online utility can be used to convert example EPCIS data between versions and data formats, as well as build EPCIS event examples in a user interface. This resource is reachable in this link: [EPCIS Sandbox | Home \(gs1.org\)](https://gs1.org/EPCIS-Sandbox)

## 10 Additional Resources

- EPCIS and CBV Standards - <https://www.gs1.org/standards/epcis>
  - The EPCIS Standard in its entirety can be found here, as well as the accompanying CBV standard, containing all information and vocabulary for populating/formatting EPCIS fields.
- Additional EPCIS Examples - <https://ref.gs1.org/docs/epcis/examples>
  - Additional general EPCIS examples can be found here, in JSON format as well as XML format.
- EPCIS and CBV Implementation Guideline - <https://ref.gs1.org/guidelines/epcis-cbv/2.0.0/>
  - Guideline on all concepts of implementing the EPCIS and CBV standards, including EPCIS event modelling considerations, querying EPCIS event data, and sharing EPCIS event data between trading partners.
- EPCIS Sandbox - <https://ref.gs1.org/tools/epcis-sandbox/>
  - The EPCIS Sandbox is a tool that can be used to generate example EPCIS 2.0 JSON or XML event data from field values entered in an intuitive user interface, as well as a format converter to take EPCIS 1.2 or 2.0 in JSON or XML and convert between combinations of those standard versions and data structures.
- EPCIS Example JSON Files from this Document
  - The example JSON data in the sections above has been lightly annotated for additional clarity. [Click here](#) to download a zip file containing individual JSON files for each CTE without annotations.



## 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

Improvements 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.

GS1 US shall not be liable for any consequential, special, indirect, incidental, liquidated, exemplary, or punitive damages of any kind or nature whatsoever, or any lost income or profits, under any theory of liability, arising out of the use of this publication or any content herein, even if advised of the possibility of such loss or damage or if such loss or damage could have been reasonably foreseen.

GS1 US HEREBY DISCLAIMS, AND YOU HEREBY EXPRESSLY RELEASE GS1 US FROM, ANY AND ALL LIABILITY RELATING TO YOUR COMPLIANCE WITH REGULATORY STANDARDS AND LAWS, INCLUDING ALL RULES AND REGULATIONS PROMULGATED THEREUNDER. GS1 US MAKES NO WARRANTIES OF ANY KIND RELATING TO THE SUITABILITY OF THE GS1 STANDARDS AND THE SPECIFIC DOCUMENTS WITHIN THIS PUBLICATION TO COMPLY WITH ANY REGULATORY STANDARDS, LAWS, RULES, AND REGULATIONS. ALL INFORMATION AND SERVICES ARE PROVIDED "AS IS."

\*GS1 US employees are not representatives or agents of the U.S. FDA, and the content of this publication has not been reviewed, approved, or authorized by the U.S. FDA. The following information contained herein is for informational purposes only as a convenience and is not legal advice or a substitute for legal counsel. GS1 US Inc. assumes no liability for the use or interpretation of the information contained herein.

## 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 "UPC" 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 the Uniform Plumbing Code as authorized by IAPMO.

\*If applicable

---

**GS1 US Corporate Headquarters**

Princeton South Corporate Center, 300 Charles Ewing Boulevard  
Ewing, NJ 08628 USA

**T** +1 937.435.3870 | **E** info@gs1us.org

[www.gs1us.org](http://www.gs1us.org)

**Connect With Us**

