



The Global Language of Business

Traceability for Fresh Fruits and Vegetables Implementation Guide

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1 Introduction

1.1 Purpose and scope of this document

Traceability is a business process that enables trading partners to follow products as they move from field through to retail store or food service operator. Each Traceability Partner must be able to identify the direct source (supplier) and direct recipient (customer) of product.

The first priority of traceability is to protect the consumer through faster and more precise identification of implicated product. This is critical if the product must be withdrawn from the supply chain.

This document serves as a best practice guide to implementing traceability in the Fresh Fruit and Vegetable (Produce) Industry. The best practices recommended are based on GS1 global standards for supply chain management and product identification. These standards were developed by industry to optimize business practices across supply chains world-wide. More information about GS1 appears in Appendix [A](#).

What is the scope of this guideline?

- Applies to fresh fruit and vegetables for human consumption.
- Traceability practices from grower to retail store or foodservice operator (i.e. external traceability).
- Applies to all levels of product and shipping containers, including pallets, cases and consumer items.

1.2 How do I use the document?

Step 1: If traceability or GS1 standards are new to your company, read the section entitled “Getting Started” in section 6.1.

Step 2: Read section 1.3 to determine your company’s role(s) in the supply chain.

Step 3: Read section 1.4 to understand key traceability definitions and principles.

Step 4: Review guidelines specific for your role(s) as outlined in sections 2 through 5.

Step 5: Begin implementation using the reference documents/appendices as assistance. Users should ensure they understand specific government and/or industry requirements, or trading practices within the target markets they serve (e.g. document retention, origin/provenance, identification, e-commerce requirements).

1.3 Who can use this document?

This is a practical guide that is intended for those responsible for implementing traceability in their company’s operations and supply chain. The document provides a guide for fresh produce growers, packers, exporters/importers, and distributors as well as their customers and suppliers. Individual organisations may perform any combinations of these roles.

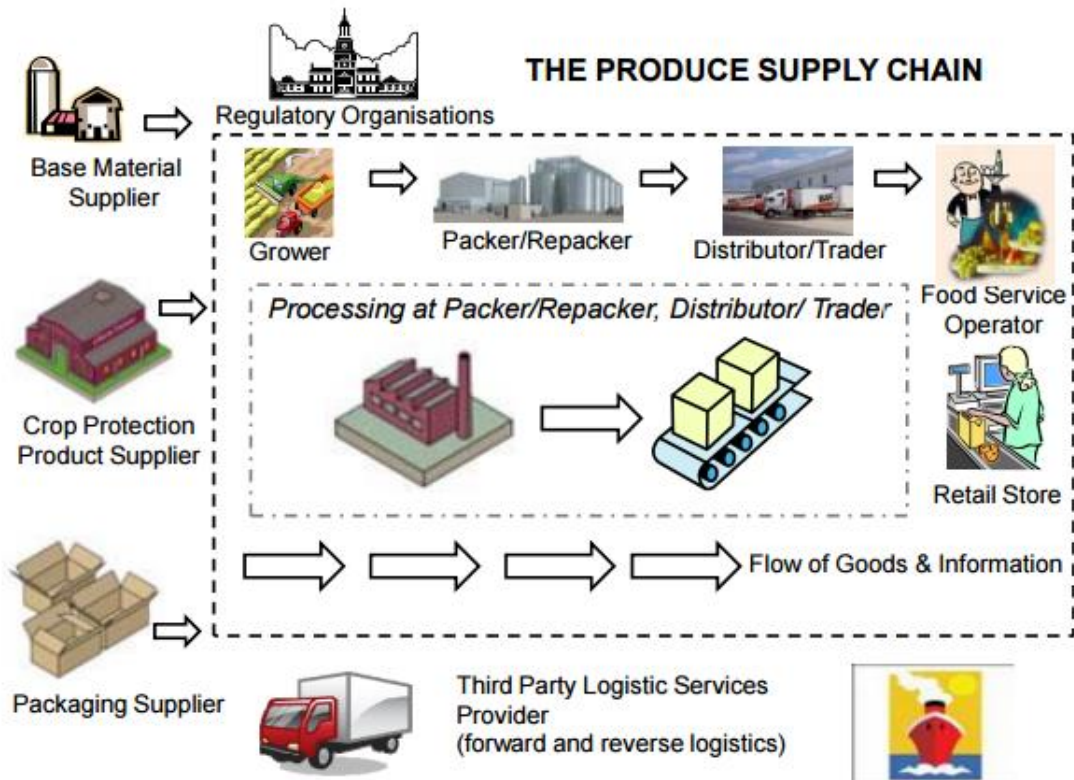
Figures 1-1 and 1-2 describe the typical roles performed in produce supply chains.

Figure 1-1 Typical Roles in the Produce supply chain

Role	Activities	Alias / Examples	Applicable Section
Primary Role (in scope)			
Grower	Grow, Harvest, Store, Sell, Ship		2
Packer/Re-packer	Aggregate, Pack, Sell, Ship	Agricultural Cooperative / Pack house	3

Role	Activities	Alias / Examples	Applicable Section
Distributor/Trader	Store, Sell, Ship	Retail or Foodservice Distribution Centre / Import and Export Warehouses / Wholesale / Terminal Markets / Auction / Broker	4
Retail Store	Store, sell to consumer		5
Food Service Operator	Store, prepare, sell to consumer		5
Secondary (out of scope)			
Third Party Logistics Service Provider	Transport, store	Truck / Rail / Ship / Air	
Supplier of packaging material		Suppliers of packing material (crates, bags, boxes, labels, bins, clamshells, etc.)	
Supplier of farm inputs		Suppliers of crop protection means, artificial manure, energy, etc.	
Supplier of seeds / plants		Supplier of seeds and plants	
Regulatory organisations		Customs, inspection agencies, etc.	

Figure 1-2 The Produce supply chain



1.4 Key traceability definitions and principles

1.4.1 Traceability definitions

- Traceability is the ability to trace the history, application or location of that which is under consideration. [ISO 9001: 2000]
- External Traceability is the business processes that occur between trading partners and the information/data exchanged to execute traceability.
- Internal Traceability is the proprietary data and business processes a company uses within its own span of operations to execute traceability.

1.4.2 GS1 traceability standard

GS1 standards are the common language of business and provide the framework required to support the traceability (business) process. This industry best practice implementation guideline is based on the GS1 Global Traceability Standard (GTS). Developed by industry, the standard defines the globally-accepted method for uniquely identifying:

- Trading parties (your suppliers, your own company, your customers, 3rd party carriers)
- Trading locations (can be any physical location such as a warehouse, packing line, storage facility, receiving dock or store)
- The products your company uses or creates
- The logistics units your company receives or ships
- Inbound and outbound shipments

The GS1 Global Traceability Standard also defines the essential pieces of information that have to be collected, recorded and shared to ensure one step up, one step down traceability. The standard is applicable to companies of all size and geography.

While the GS1 Global Traceability Standard may be implemented independently from any specific technology, best business practices require adoption of barcoding on cases and/or pallets. Businesses are further encouraged to adopt electronic messaging to exchange essential business information. These technologies will be explored in the sections that follow.

GS1 is a not-for-profit standards organisation with member affiliates in every country. Together with local/national produce trade associations they are important resources that are able to help your company understand the most effective way to implement traceability with your trading partners. They can also help your company to connect with technology providers that serve the produce industry.

Information on how to obtain a copy of the Global Traceability Standard appears in Appendix [A](#).

1.4.3 Traceability principles

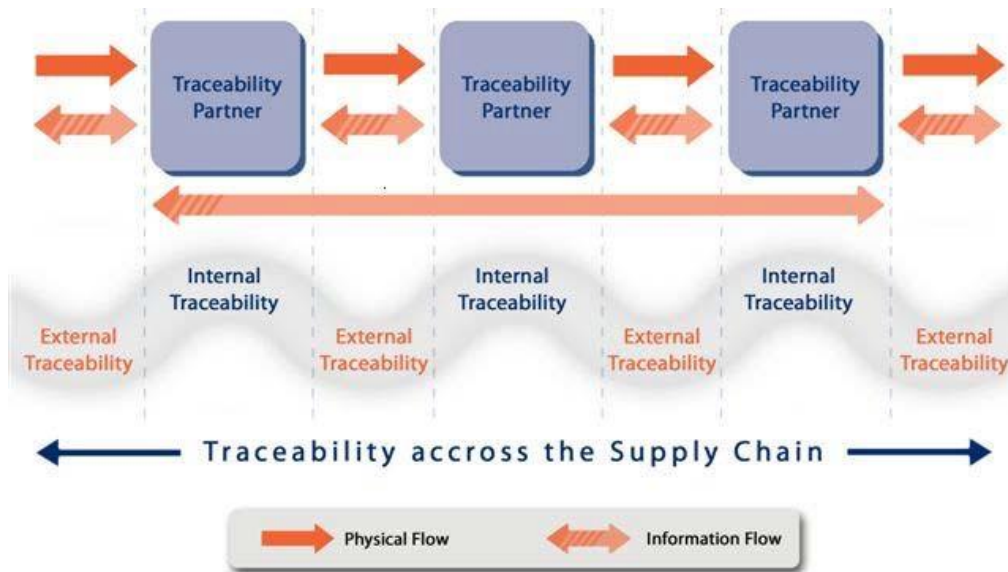
- A company must determine what needs to be traced. This is commonly referred to as the “traceable item.” A traceable item can be:
 - a product or traded item (e.g. case/carton, consumer item)
 - a Logistic Unit (e.g. bin, container)
 - a shipment or movement of a product or trade item

There must be agreement between trading partners on what the traceable item is. This ensures that both partners are tracking the same thing. Otherwise the chain will be broken. Each Trading Partner must define at least one level of traceable item for each shipment.

- All traceable items must be uniquely identified and this information is shared between all affected supply chain partners.
- At a minimum, the identification of products for the purpose of traceability requires:
 - The assignment of a unique GS1 Global Trade Item Number (GTIN)

- The assignment of a batch / lot.
- When a product is reconfigured and/or re-packed, the new product must be assigned a new unique product identification (i.e. GTIN). A linkage must be maintained between the new product and its original inputs.
- When a Logistic Unit is reconfigured, the new Logistic Unit must be assigned a new unique identification (i.e. SSCC). A linkage must be maintained between the new Logistic Unit and its original input.
- All supply chain parties must systematically link the physical flow of products with the flow of information about them. Traceable item identification numbers must be communicated on related business documents.

Figure 1-3 Traceability across the supply chain



- ✓ **Note:** A traceability partner can be a grower, packer/repacker, distributor/trader, retail store or foodservice operator.
- Each Traceability Partner (company) must be able to identify the direct source (supplier) and direct recipient (customer) of traceable items. This is the "one step up, one step down" principle. This requires that supply chain partners collect, record/store and share minimum pieces of information for traceability which are described in the sections which follow.
- All supply chain parties require both internal and external traceability. (Implementation of internal traceability must ensure that the necessary linkages between inputs and outputs are maintained.)
- Any asset (e.g. returnable pallet) which needs to be traced forward or traced back must be uniquely identified.
- Labels showing the traceable item identification number must remain on the packaging until the traceable item is consumed or destroyed (by the next trading partner). This principle applies even when the traceable item is part of a larger packaging hierarchy.

1.4.4 Recall preparedness

Any trading party may initiate a trace or recall request. Efficient trace or recall requests require that the suspect items are identified using their unique identification numbers.

To ensure preparedness in the event of an incident, every company should have a traceability team in place and practice/simulate recalls to test the traceability system in place.

2 Implementation guideline for growers

This section is intended for Growers who are **NOT** packing product (i.e. their only role is that of a primary producer). Growers who pack product should also refer to Section 3. If you only perform the grower role, the traceable item is always the Logistic Unit.

2.1 Capturing production inputs

To enable traceability, growers must maintain records of essential information related to the production of the product (e.g. crop protection materials including date of application, seed information, fertilizers, packaging material, harvesting crew, and water source). This information is critical to your company's body of internal traceability information.

2.2 How does my company uniquely identify logistics units and grower information?

Each Logistic Unit destined for a packing facility must be uniquely identified. Examples of logistics units include bins, totes, containers, trailers.

To uniquely identify logistics units or to participate in electronic commerce, the best practice is to use the GS1 Serialised Shipping Container Code number (SSCC). This number is based on your GS1 Company Prefix number (supplied to you through your local GS1 Member Organisation), thus ensuring global uniqueness.

Over time, your company will exhaust its pool of available GS1 SSCC numbers. It is important that you manage the re-use of SSCC numbers so as not to conflict with the logistics units already in the supply chain. An industry best practice is to restrict the use of SSCC numbers for a period of no less than one year.

Additional information about GS1 SSCC assignment appears in [Appendix A](#).

What additional grower/harvest information is required?

To assist packers in assigning batch / lot at the pack house, growers should include on their Logistic Unit tag/label, in human-readable format, all relevant grower/harvest information. The information included should enable the creation of a meaningful batch / lot and could include the harvest crew, field or plot of harvest, date of harvest, etc.

What information must appear on the Logistic Unit label?

Each logistics label should provide the following data in human-readable format:

- Unique Logistic Unit identification (e.g. SSCC)
- Commodity name and, where applicable, variety name
- Your company's unique identification (see section 2.3)
- Additional grower/harvest information

2.3 How is my company identified uniquely?

The best practice is to use the GS1 Global Location Number (GLN). GLN is a standard that can be used to uniquely identify your company and its premises. GLN's can be allocated either by a GS1 Member Organisation or by your company using your GS1 Company Prefix.

Additional information about GLN assignment appears in [Appendix A](#).

2.4 What traceability information does my company need to record and share?

To ensure that the traceability link is maintained, the following data must be recorded and shared. This represents the minimum data set required to ensure traceability between you and your trading partners.

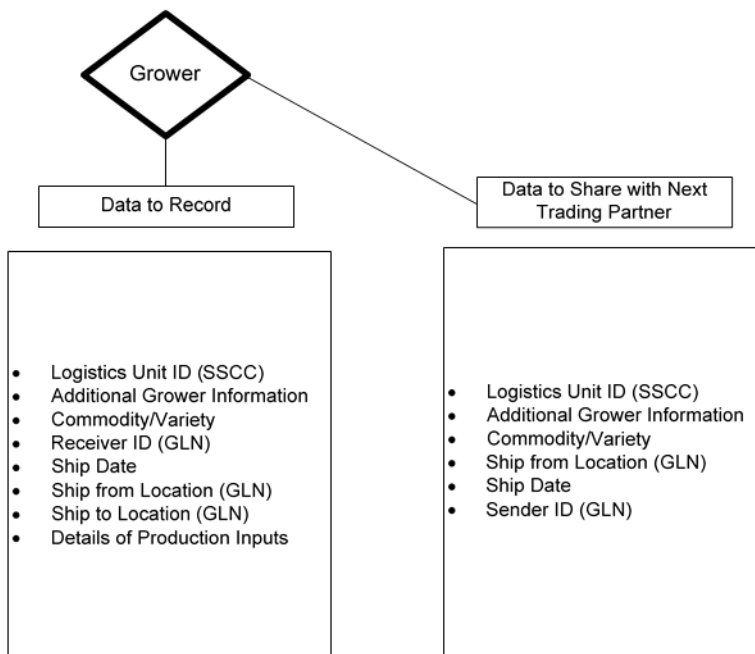
- Logistic Unit identification (SSCC)
- Commodity name and, where applicable, variety name
- Receiver Identification (GLN)
- Ship from location identification (i.e. GLN of shipping location)
- Ship to location identification (i.e. GLN of receiving location/trading partner)
- Ship Date
- Grower records details related to growing/production (e.g. field, seeds, details of production inputs)
- Additional grower information (e.g. harvest crew, date of harvest) to enable batch / lot assignment by the trading partner (packer)
- Sender Identification (GLN)

Data attribute definitions are provided in the Glossary (Appendix B).

The accompanying chart, Data Requirements for Growers, further illustrates the minimum data required to maintain traceability.

DATA REQUIREMENTS FOR GROWERS

Growers who are the **FIRST** participants in the supply chain (**NO** previous trading partners) will have **NO** data to collect from the previous trading partner.



2.5 Other traceability Best Practices for growers

1. Assign SSCC number to Logistic Unit
 - a. Affix labels bearing the SSCC number to corresponding Logistic Unit
 - b. The SSCC numbers are shown in barcode format using GS1-128 symbology
2. If transmitting product information electronically, use standard EDI EANCOM® messages to convey shipment details. Send EDI (EANCOM®) Despatch Advice to receiver:
 - a. Link Logistic Unit (SSCC) to packing reference information (this may be the purchase order, shipment, packing run number or harvest work order)

- a. Link packing reference to shipment

2.5.1 Data retention

All companies are expected to maintain records that will facilitate timely and accurate traceability and support any product recalls. It is recommended that your company establish your internal data retention policy based on the following considerations:

1. Government or market requirements
2. How long your product may exist (somewhere) in the supply chain
3. The need to retrieve data in the event of an epidemiological trace-back which may, or may not, implicate your product.

2.6 Business scenario for growers

2.6.1 Grower delivers bulk to pack house or cooperative

Who are the trading parties?

ABC Farms grows, harvests, and transports raw product to other companies (pack houses and/or cooperatives) which, in turn, receive, sort, grade and pack raw product received in bulk from ABC Farms into "finished product" configurations.

What needs to be traced?

ABC Farms is responsible for recording and maintaining information that will enable batch / lot assignment during the packing process. ABC Farms are also responsible for providing this information to its trading partners as product is delivered.

How do they accomplish this?

ABC Farms harvests their product and transports the raw product in bins or field boxes to their trading partners. As product is harvested, ABC records information related to each day's activity based on commodity, harvest date, field being harvested (i.e. Ranch/Plot, Unit/Block) and harvesting crew. A human-readable "field tag" is generally applied to the bin or field boxes as they are filled. The "field tag" generally includes information as outlined above. To enable greater granularity during the batch / lot assignment, additional information could include specifics on the actual truck load of raw product being transported to their trading partner.

ABC Farms is responsible for conveying the day's activity/harvest information, (as stipulated in section 2.2) along with the number of units (bins or field boxes), to the trading partner that will be receiving the product. Although this information is contained on "field tags" affixed to each bin or field box, it should also be conveyed via a "receiving" or "trip" ticket containing all the information and that is given to the driver of the vehicle transporting the raw product to ABC's trading partner.

3 Implementation Guideline for packers/repackers

3.1 Capturing Production inputs

Logistics units coming from growers:

Growers deliver product in bulk using various containers or logistics units for transport. Common examples of logistics units include totes, bins and trailers. Each Logistic Unit must be individually traceable. For this reason, each Logistic Unit carries a tag or label that shows a unique identification number. This is a GS1 Serial Shipping Container Code (SSCC) number and is assigned by the Grower. Use of the SSCC number ensures not only distinct identification from any of the Grower's other shipping containers but also guarantees uniqueness across all growing companies providing product. The tag or label provides other important information including:

- Commodity name and, where applicable, variety name
- Additional grower/harvest information
- The grower's unique company identification (GLN)

Product coming from packers:

Product sourced from other packers is identified using the GS1 Global Trade Item Number (GTIN). The assignment of GTINs for each product traded (i.e. all product configurations) is the responsibility of the brand owner and must be recorded in the re-packer's internal systems prior to being re-packed and traded. Use of the GS1 GTIN ensures unique product identification across all of the supplier's product configurations.

Traceability is accomplished by associating each GTIN with its batch / lot. GTIN and batch / lot information is shown on individual case labels.

Other sources of supply:

To enable traceability, packers/repackers must also maintain records of other product inputs (e.g. packaging material, packing line information, etc.). This information is equally critical to your company's body of internal traceability information.

3.2 How is my company identified uniquely?

The best business practice is to assign a GS1 Global Location Number (GLN) to your company and then share that number with suppliers and customers. GLNs can be allocated either by a GS1 Member Organisation or by your company using your GS1 Company Prefix.

Individual GLN's can be assigned to represent your company as well as any individual trading subsidiaries. GLN's can also be used to identify important production, storage, shipping or receiving locations in your company.

Additional information about GLN assignment appears in Appendix A.

3.3 How does my company identify products in the supply chain?

The best practice is to assign a GS1 Global Trade Item Number (GTIN) for each traded item.

What is a Global Trade Item Number?

A Global Trade Item Number (GTIN) is a standardised and globally unique way to identify items traded in the supply chain. Where there is a requirement to accurately order, invoice, price or receive your product, the GTIN is the basic enabler. The GTIN provides a common language to support multiple business practices, including traceability.

How is a GTIN assigned to the traded items my company produces?

Where product is sold under a brand name, the brand owner is responsible for assigning the GTIN. If the company is the brand owner, the first step is to approach your local GS1 Member Organization and apply for a GS1 Company Prefix. A brand owner typically owns the label for the product that is sold; this may also include non-branded packaging. The GS1 Company Prefix will be globally unique for each organisation and it will be used to create the GTINs assigned to the organisation's trade items. Your company then assigns a GTIN to each of your products and each product and packaging configuration.

If your company is not the brand owner, you must use the brand owner's GTIN.

Where can I learn more about GTIN assignment?

See Appendix A.

3.4 How does my company identify products that must be traced?

The best practice is to identify traceable products (packages/cases) by their GTIN and the associated production batch / lot. Where a package contains pre-packaged inner packages, each inner should be assigned and marked with a unique GTIN.

How does my company identify production batches/lots?

All packers/repackers must assign a batch / lotto products they create. The batch / lot itself can vary from one company to another, depending on the precision desired. For example, a batch / lot can represent a day's production or the product produced from an individual packing line. Packer/re-pack batch / lot must be internally linked to the original grower/harvest information.

It is important to remember that your batch / lot relates to the scope of products that may be implicated in a recall and needs to be considered during assignment.

3.5 How does my company uniquely identify logistics units?

For packers and repackers, outbound logistics units are typically pallets or containers. When your company's traceable item is one or more logistics units, the best business practice is to assign a GS1 Serial Shipping Container Code (SSCC) to each Logistic Unit. Each SSCC number that is assigned is unique to the individual Logistic Unit and is based on your company's GS1 Company Prefix number. This ensures uniqueness world-wide.

Over time your company will exhaust its pool of available SSCC numbers. For this reason, it is important that your company manage the re-use of SSCC numbers so as not to conflict with logistics units already in the supply chain. The best practice is to restrict the re-issue of SSCC numbers for a period of no less than one year.

Additional information about SSCC assignment appears in Appendix A.

3.6 Best practice for case and logistic unit labels

Guidelines for case labels

Case labels provide a means to identify product to other trading partners. The label shows the product identification (i.e. the GTIN) and associated batch / lot in an easy-to-read human-readable form and should also, as a best practice, provide case information using GS1-compliant barcodes. This ensures cases can be identified quickly and accurately at any subsequent point in the supply chain, anywhere in the world. Case barcodes (i.e. symbols) conform to a symbology called GS1-128. Your local GS1 Member Organisation can help your company understand how to produce GS1-128 barcodes and provide guidance on label placement.

You should note that where your company's case product is sold to consumers in the case (i.e. the case is sold at retail point-of-sale), a second barcode symbology must be used to enable front end / point-of-sale scanning. Your local GS1 Member Organisation can also provide assistance on using a barcode that can be scanned at point-of-sale.

When the traceable item is the Logistic Unit (i.e. each Logistic Unit needs to be uniquely identified and tracked), refer to the guidelines below for Logistic Unit labels.

Figure 3-1 shows examples of GS1-128 case labels uniquely identifying a traded product.

Figure 3-1 Examples of GS1-128 case labels



(01) 10614141000415 where (01) = AI 01 (GTIN)

(10) 02228ABC where (10) = Batch / Lot

Where can I learn more about creating GS1-compliant barcodes?

See Appendix A.

Guidelines for Logistic Unit labels:

When the traceable item is the Logistic Unit, labels provide a means to identify that shipping container (or pallet) to other trading partners. The label shows the Logistic Unit identification (i.e. the SSCC number) in an easy to read human-readable form. Additional information may be shown on the pallet label.

Your local GS1 Member Organisation can help your company to understand global standards for logistics labels.

The best practice is to provide pallet information using GS1-compliant barcodes. This ensures pallets can be identified quickly and accurately at any subsequent point in the supply chain, anywhere in the world. Pallet barcodes (i.e. symbols) conform to a symbology called GS1-128. Your local GS1 Member Organisation can help your company understand how to produce GS1-128 barcodes and provide guidance on label placement.

The figure below shows an example of a GS1-128 pallet label uniquely identifying a Logistic Unit.

Figure 3-2 Example of a GS1-128 pallet label



(00) 034531200000002527 where (00) = AI 00 (SSCC)

Where can I learn more about creating GS1-compliant barcodes?

See Appendix A.

3.7 What traceability information does my company need to collect, record and share?

To ensure that the traceability link is maintained, the following data must be collected, recorded and shared. The following represents the minimum data required to ensure traceability between your suppliers (i.e. growers) and your customers.

- When your company is a packer:
- When the grower’s inbound Logistic Unit is the inbound traceable item
 - Logistic Unit identification (SSCC)
 - Commodity name and, where applicable, variety name
 - Ship from location identification (i.e. GLN of shipping location)
 - Receipt date
 - Grower/harvest information
 - Ship date
 - Sender Identification (GLN)
- When your company’s (outbound) product (package/case) is the traceable item
 - Trade item identification (GTIN)
 - Trade item description
 - Batch / Lot
 - Trade item quantity and unit of measure

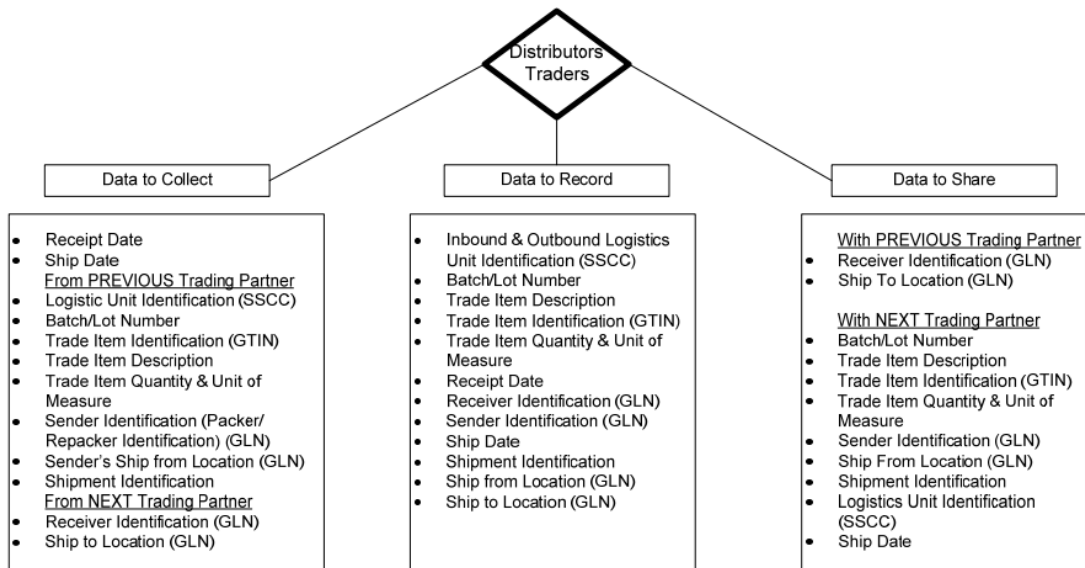
- Ship from location identification (i.e. GLN of the shipping location)
- Ship to location identification (i.e. GLN of the receiving location/trading partner)
- Ship date
- Sender Identification (GLN)
- Receiver Identification (GLN)
- When your company's (outbound) Logistic Unit is the traceable item
 - Logistic Unit identification (SSCC)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship Date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)
- When your company's (outbound) shipment is the traceable item
 - Unique shipment identification (e.g. may be the bill of lading number)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)
- When your company is a repacker:
- When the packer's (inbound) product (package/case) is the traceable item
 - Trade item identification (GTIN)
 - Trade item description
 - Batch / Lot
 - Trade item quantity and unit of measure
 - Ship from location identification (i.e. GLN of the shipping location)
 - Ship date
 - Sender Identification (GLN)
 - Receipt date
- When the packer's (inbound) Logistic Unit is the traceable item
 - Logistic Unit identification (SSCC)
 - Ship from location identification (i.e. GLN of shipping location)
 - Receipt date
 - Ship date
 - Sender Identification (GLN)
- When the packer's (inbound) shipment is the traceable item
 - Unique shipment identification (e.g. may be the bill of lading number)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date

- Sender Identification (GLN)
- Receiver Identification (GLN)
- Receipt date
- When your company's (outbound) product (package/case) is the traceable item
 - Trade item identification (GTIN)
 - Trade item description
 - Batch / Lot
 - Trade item quantity and unit of measure
 - Ship from location identification (i.e. GLN of the shipping location)
 - Ship to location identification (i.e. GLN of the receiving location/trading partner)
 - Ship date
 - Receiver Identification (GLN)
 - Sender Identification (GLN)
- When your company's (outbound) logistics item is the traceable item
 - Logistic Unit identification (SSCC)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)
- When your company's (outbound) shipment is the traceable item
 - Unique shipment identification (e.g. may be the bill of lading number)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)

Data attribute definitions are provided in the Glossary (Appendix B).

The accompanying chart, Data Requirements for packers further illustrates the minimum data required to maintain traceability:

DATA REQUIREMENTS FOR DISTRIBUTORS/TRADERS



3.8 Other traceability Best Practices for packers/repackers

- Where the brand of the product belongs to your company or the product is not branded at all:
 - Assign GTINs for pre-packaged consumer units or loose produce
 - Assign GTINs for all case configurations
 - Label product using the appropriate GS1 Data Carrier
- Where the brand of the product belongs to another trading partner (e.g. private label of a retailer):
 - Use brand owner's GTINs for pre-packaged consumer units or loose produce
 - Label product using the appropriate GS1 Data Carrier
 - Use brand owner's GTINs for all case configurations
- For cases initially being packed and configured, also store:
 - Purchase order number for product received
 - Transporter of inbound product
- For cases being repacked and/or reconfigured:
 - Scan SSCC number from each inbound Logistic Unit (e.g. pallet) for automated receipt
 - Store GTIN and corresponding batch / lot in system
 - Link original GTIN and corresponding batch / lot (for each original product inputted to the newly created item) with GTIN from newly created case and corresponding batch / lot and store this link in your computer systems
 - Assign GTINs for all new case configurations
 - Encode both the newly created GTIN and corresponding batch / lot in a GS1 data carrier, e.g. a GS1-128 barcode
 - Assign a SSCC number to each Logistic Unit
 - Link case GTINs and corresponding batch / lot residing in that Logistic Unit to the SSCC number

- Affix pallet tags bearing the SSCC numbers that are unique to each Logistic Unit. Also store:
 - Purchase Order Number associated with an outbound product
 - Transporter of outbound product
- Send (EANCOM®) Despatch Advice® to receiver
 - Link item to case GTIN and case batch / lot
 - Link case GTIN and corresponding batch / lot to Logistic Unit SSCC
 - Link Logistic Unit SSCC to Purchase Order
 - Link purchase order, if necessary, to shipment
- Link SSCC number with corresponding GTIN and batch information as well as purchase order information to shipment details. This should include:
 - Ship to Location Identification (GLN) and Address
 - Purchase Order number
 - Transporter
 - Ship from location Identification (GLN) and Address
 - Trade Item Quantity and Unit of Measure
 - Ship Date
 - Expected Delivery Date *by buyer*

Data retention:

All companies are expected to maintain records that will facilitate timely and accurate traceability and support any product recalls.

It is recommended that your company establish your internal data retention policy based on the following considerations:

- Government or market requirements
- How long your product may exist (somewhere) in the supply chain
- The need to retrieve data in the event of an epidemiological trace-back which may, or may not, implicate your product.

3.9 Business scenarios for packers/repackers

3.9.1 Packer scenario: Field packed product

Who are the trading parties?

ABC Farms grows product for XYZ Packing Company who is responsible for performing the following activities with the product:

- Harvesting
- Sorting/grading
- Field packing
- Transporting
- Cooling
- Storing

XYZ Packing Company packs all of ABC Farms product in cases with XYZ's brand.

What needs to be traced?

Since ABC is only growing and field packing the product, XYZ Packing Company is responsible for recording and maintaining GTIN and related batch / lot information about raw product used to create cases of product in XYZ's brand.

How do they accomplish this?

XYZ Packing Company harvests, sorts/grades and packs product in a field. They assign a unique batch / lot to each day's activity based on commodity, harvest/pack date, field being harvested (i.e. Ranch/Plot, Unit/Block) and harvesting crew. Finer batch / lot granularity could be obtained by assigning a unique batch / lot based, not only on the above attributes, but also on a truck load of packed product being transported to the cooling/storage facility.

As product is packed, a case label containing XYZ's GTIN and the batch / lot in barcode and human-readable format is applied to each case before being palletized. XYZ also affixes an internal pallet tag to each completed pallet for internal inventory control purposes.

Each load of product being transported from the field should also have batch / lot information conveyed via a "receiving" or "trip" ticket that is given to the driver of the vehicle transporting the packed product to XYZ's facility.

Once product arrives at the cooling/storage facility the "receiving" or "trip" ticket should be verified against actual product received and each case or pallet of product should be recorded in XYZ's Warehouse Management System (WMS).

During all phases of product movement within the cooling/storage facility (pre-cooling, put away, staging, shipment, etc.), internal records are maintained by GTIN and batch / lot at the case or pallet level. This process assures that XYZ Packing can accurately track product by batch / lot from field to shipment in the event of a recall incident.

3.9.2 Packer scenario 2: Shed (Packinghouse) packed product

Who are the trading parties?

Ideal packers is a produce packing company that operates a packinghouse where product is received from various growers, including ABC Farms, who deliver raw product to Ideal's facilities where the following activities are performed on the product:

- Sorting/grading
- Packing (under Ideal Packers' Brand)
- Cooling
- Storing
- Selling
- Shipping

What needs to be traced?

All raw product supplied by growers to Ideal Packers must be properly identified according to the guidelines outlined in section 2 "Implementation Guidelines for Growers". Ideal Packers must maintain records pertaining to all inbound raw product. Ideal Packers must also maintain information pertaining to packed (finished) product with linkage to raw product information (commodity, variety and additional growing information) supplied by growers.

How do they accomplish this?

Product is harvested in the field and placed in bins which are brought by truck to Ideal Packers' packing shed. These logistics units serve as the traceable unit between ABC Farms and Ideal Packers. A human-readable "field tag" is applied to the bin or pallets of field boxes. The "field tag" generally includes the commodity name, variety name, name or number of the field, date, and possibly the harvest crew.

When the truck arrives at the pack shed, the product is moved to a holding area until it is to be packed (generally fairly quickly, but could be held in a cold room overnight, or for months like apples in a controlled atmosphere storage). A receiving ticket is generated noting the SSCC number, commodity and variety received, grower/harvest information, quantity, date, time, and truck.

When it is time to pack the produce, the raw product is retrieved from the holding area and brought to a packing area where the product is placed onto the packing line. Before packing begins, Ideal Farms assigns a batch / lot to the production run. When different product (commodity/variety) or product from a new field is brought to the packing line, there is a pause to let the product from the previous production run finish being packed and a new batch / lot is assigned to the next production run. After the product is graded and packed into cartons, a label is applied to the carton containing human-readable information about the product. The label also contains a GS1-128 barcode that includes Ideal Packers' GTIN for the item and the batch / lot.

Once the pallet is ready to ship to a customer, Ideal Packers must make sure that a pallet tag with an SSCC has been created and affixed to each pallet being shipped. The SSCC pallet tag number will be linked to internal pallet information within Ideal Packers' systems.

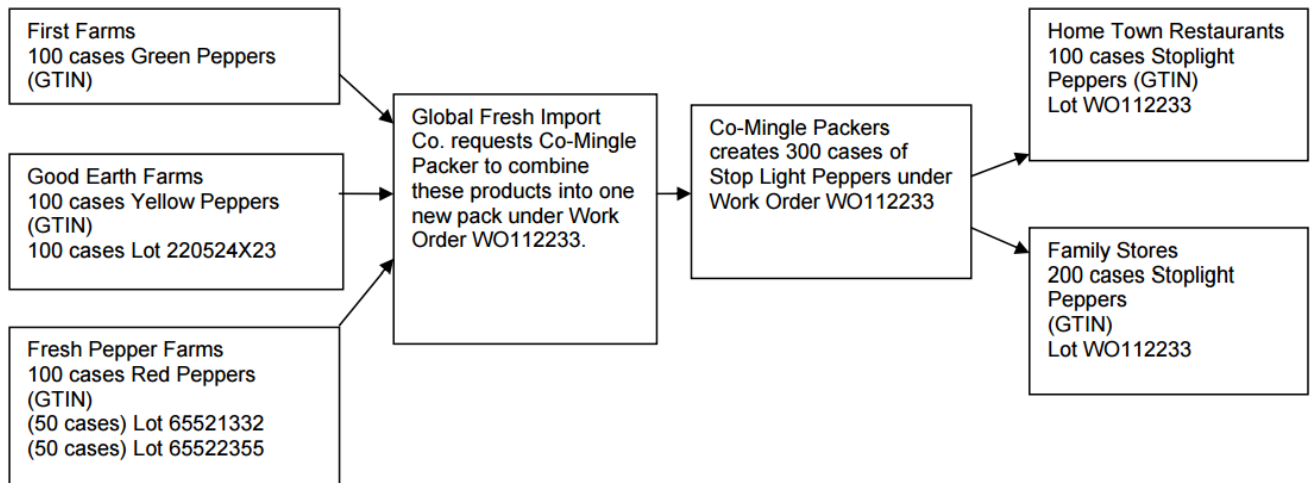
Ideal Packers sends an EDI (EANCOM®) Despatch Advice to the customer identifying the pallets (SSCC) on the shipment and the product (including GTIN and batch / lot) on each pallet.

3.9.3 Repacker scenario 1: Repack of previously packed product

Who are the trading parties?

Co-Mingle Packers is a produce packing company that operates a re-pack facility where product is received from grower suppliers, through the services of Global Fresh Import Company, an importer who delivers packed product to Co-Mingle Packers' facilities. The product Co-Mingle Packer receives will be from multiple growers and contain multiple batch / lot which will be commingled into the same package to be delivered to Co-Mingle Packers' customers.

Diagram of the re-packing process:



What needs to be traced?

Co-Mingle Packers will combine product with multiple GTINs and batch / lot into a new package where a new GTIN and batch / lot will be assigned. Each batch of product repacked will need to have a unique reference number assigned to track the input product to the output product. Co-Mingle Packers must record all the GTINs, batch / lot and quantities of the source product to this reference number. The reference number will be assigned as the batch / lot to the output product created from the re- pack.

How do they accomplish this?

Global Fresh Import Company sources product from many growers and sells this product to customers, the product received from growers is already packed into standard packaging ready for

delivery to the customer. When Global Fresh Import Co. is requested to pack product into specialty packs for the customer, a work order is created for Co-Mingle Packers. Global Fresh Import Co. will deliver product to Co-Mingle Packers prior to the re-pack service being required.

When it is time to pack the produce, Co-Mingle Packers will scan the Work Order Number, pallet SSCC number and each GS1 case label to record the GTIN and batch / lot information for each case of product used as source product. As each case is created in the new pack, a GS1 case label is printed with the new GTIN and batch / lot. The GTIN will be the brand owner's GTIN and the batch / lot will be the Work Order Number. The Work Order Number is the control number for traceability to reference the GTIN and batch / lot combinations that were commingled. In the event of a recall, if any of the source products were identified as implicated then all the output product would now need to be considered implicated as well.

The labelled cartons are stacked on pallets for storage prior to being shipped. Once a pallet is complete, a new SSCC pallet tag is attached to the pallet. All the GS1 case labels are scanned and recorded against the new SSCC pallet tag. Co-Mingle Packers sends an electronic EDI (EANCOM®) Despatch Advice message to their customers identifying the pallets (SSCC) on the shipment and the product (including GTIN and batch / lot) on each pallet.

4 Implementation Guideline for Distributors/Traders

4.1 Capturing traceability inputs

Distributors/traders must capture product information from their supplier companies. These products are identified using a GS1 Global Trade Item Number (GTIN). The assignment of GTINs for each product traded (i.e. all product configurations) is the responsibility of the brand owner and must be recorded in the distributor/trader's internal systems prior to product being traded. Use of the GS1 GTIN ensures unique product identification across all of a supplier's product configurations and uniqueness across all sources of supply.

Traceability is accomplished by associating each GTIN with its batch / lot. GTIN and batch/lot information is displayed on individual case labels. This information will need to be captured, stored, and communicated to the food service operator/retailer.

Distributors/traders may also need to capture information about inbound logistics units, these are typically pallets. Pallets are identified at the time that they are created by the packer and are individually identified using a GS1 Serial Shipping Container Code (SSCC). This number is assigned by the packer/shipper and appears on individual Logistic Unit labels. The pallet label provides other important information that must be collected and recorded. To enable traceability, distributor/traders must also maintain records of other product inputs (e.g. packaging material) for their own use. This information is equally critical to a company's body of internal traceability information.

4.2 How is my company identified uniquely?

The best business practice is to assign a GS1 Global Location Number (GLN) to your company and then share that number with suppliers and customers. Like the GTIN, a GLN is based on your GS1 Company Prefix Number, thus ensuring global uniqueness. GLN's can be allocated either by a GS1 Member Organisation or by your company using your GS1 Company Prefix.

Individual GLN's can be assigned to represent your company as well as any individual trading subsidiaries. GLN's can also be used to identify important production, storage, shipping or receiving locations in your company.

Additional information about GLN assignment appears in Appendix A.

4.3 How does my company identify Products in the Supply Chain?

Where distributors/traders simply re-sell product from their packer/re-packer suppliers (i.e. products are not re-configured into other traded units), they must use the GS1 GTINs assigned by the packer/re-packer suppliers to inbound products.

Where distributors re-configure product from suppliers, the best practice is to assign a new GS1 GTIN for each new product. Please refer to Section 3 (for packers/repackers)

What is a Global Trade Item Number?

A Global Trade Item Number (GTIN) is a standardized and globally unique way to identify items traded in the supply chain. Where there is a requirement to accurately order, invoice, price or receive your product, the GTIN is the basic enabler. The GTIN provides a common language to support multiple business practices, including traceability.

How is a GTIN assigned to the traded items my company produces?

Where product is sold under a brand name, the brand owner is responsible for assigning the GTIN. If your company is the brand owner, the first step is to approach your local GS1 Member Organization and apply for a GS1 Company Prefix. The GS1 Company Prefix will be globally unique for each organisation and it will be used to create the GTINs assigned to the organisation's trade items. Your company then assigns a GTIN to each one of your products and every packaging configuration.

If your company is not the brand owner, then you must use the brand owner's GTIN.

Where can I learn more about GTIN assignment?

See Appendix A.

4.4 How does my company identify product that must be traced?

The best practice is to identify individual products by their GTIN and the associated production batch / lot.

4.5 How does my company identify production batches/lots?

All distributors/traders must assign a batch / lot to products they create. The batch / lot itself can vary from one company to another, depending on the precision desired. For example, a batch / lot can represent a day's production or the product produced from an individual packing line.

It is important to remember that your batch / lot relates to the scope of products that may be implicated in a recall and needs to be considered during assignment.

4.6 How does my company uniquely identify logistics units?

For distributors/traders, outbound logistics units are typically pallets or containers. When your company's traceable item is one or more logistics units, the best business practice is to assign a GS1 Serial Shipping Container Code (SSCC) to each Logistic Unit. Each SSCC number that is assigned is unique to the individual Logistic Unit and is based on your company's GS1 Company Prefix number. This ensures global uniqueness.

Over time your company will exhaust its pool of available SSCC numbers. For this reason, it is important that your company manage the re-use of SSCC numbers so as not to conflict with logistics units already in the supply chain. The best practice is to restrict the re-issue of SSCC numbers for a period of no less than one year.

Additional information about SSCC assignment appears in Appendix A.

4.7 Best Practices for Case and Logistic Unit Labels

Guidelines for Case Labels

When the traceable item is the product, case labels provide a means to identify that product to other trading partners. The label shows the product identification (i.e. the GTIN) and associated batch / lot in an easy-to-read human-readable form and, as best practice, should also be provided using GS1-compliant barcodes. This ensures cases can be identified quickly and accurately at any subsequent point in the supply chain, anywhere in the world. Case barcodes (i.e. symbols) conform

to a symbology called GS1-128. Your local GS1 Member Organisation can help your company understand how to produce GS1-128 barcodes and provide guidance on label placement.

You should note that where your company’s case product is sold to consumers in the case (i.e. the case is sold at retail point-of-sale), then a second barcode symbology will have to be used to enable front end and point-of -sale scanning. Your local GS1 Member Organisation can also provide assistance on using a barcode that can be scanned at point-of-sale. When the traceable item is the Logistic Unit (i.e. each Logistic Unit needs to be uniquely identified and tracked), refer to the guidelines below for Logistic Unit labels.

Figure 4-1 examples of GS1-128 case labels



(01) 10614141000415 where (01) = AI 01 (GTIN)

(10) 02228ABC where (10) = Batch / lot

Where can I learn more about creating GS1-compliant barcodes?

See Appendix A.

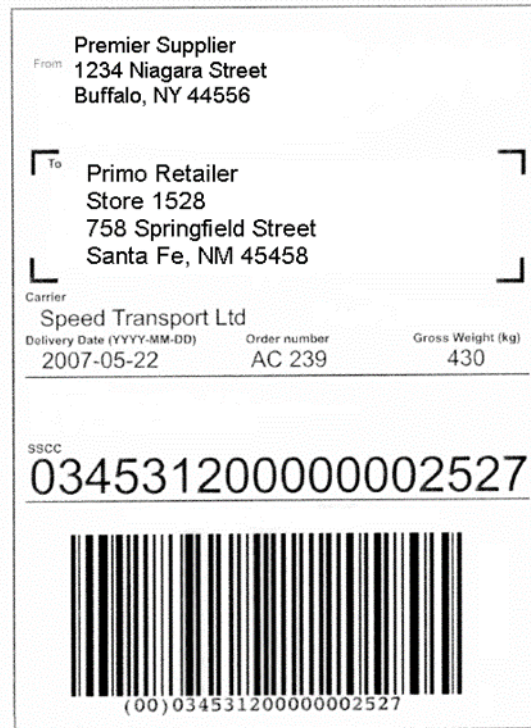
Guidelines for Logistic Unit labels:

When the traceable item is the Logistic Unit, labels provide a means to identify that shipping container to other trading partners. The label shows the Logistic Unit identification (i.e. the SSCC number) in an easy to read (human-readable) form. Additional information may be shown on the pallet label. This is usually determined by customer-specific relationships.

The best practice is to provide pallet information using GS1-compliant barcodes. This ensures pallets can be identified quickly and accurately at any subsequent point in the supply chain, anywhere in the world. Pallet barcodes (i.e. symbols) conform to a symbology called GS1-128. Your local GS1 Member Organisation can help your company understand how to produce GS1-128 barcodes and provide guidance on label placement.

Figure 4-2 shows an example of a GS1-128 pallet label uniquely identifying a Logistic Unit.

Figure 4-2 Example of a GS1-128 pallet label



(00) 034531200000002527 where (00) = AI 00 (SSCC)

Where can I learn more about creating GS1-compliant barcodes?

See Appendix A.

4.8 What traceability Information does my company need to collect, record and share

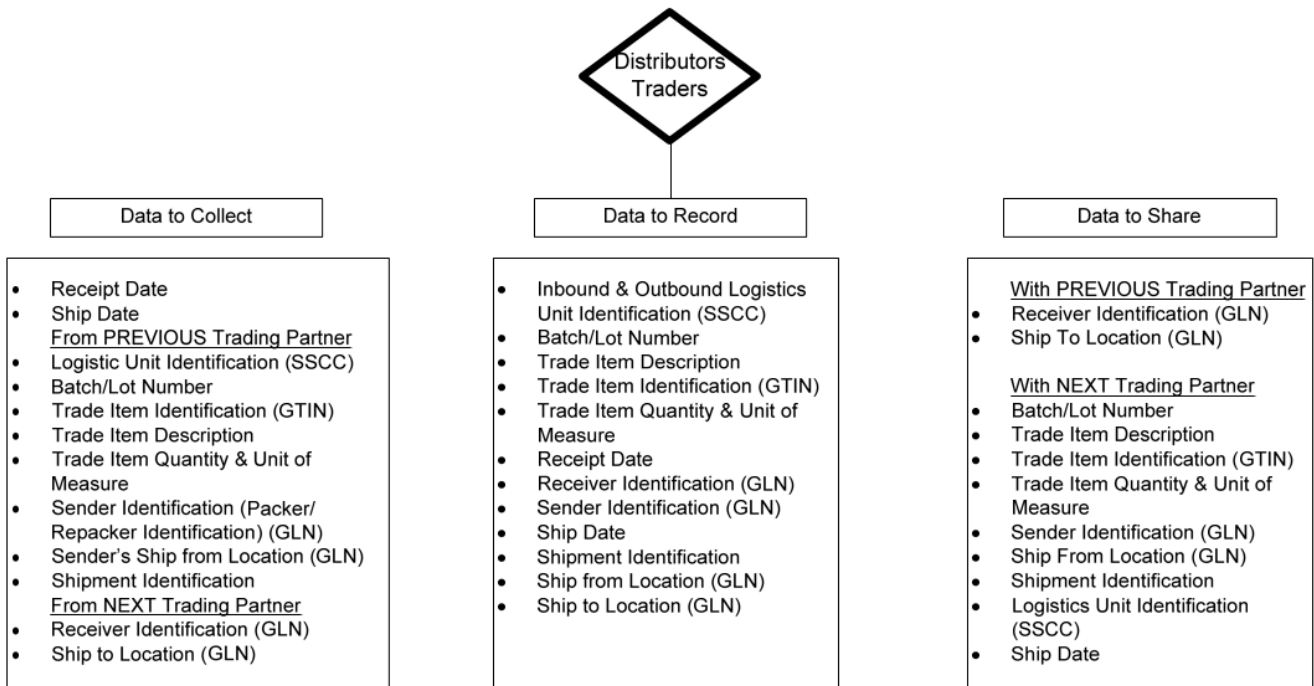
To ensure that the traceability link is maintained, the following data must be collected, recorded and shared. The following represents the minimum data required to ensure traceability between your suppliers (i.e. packers/repackers) and your customers.

- When the packers/repacker’s (inbound) product (package/case) is the traceable item
 - Trade item identification (GTIN)
 - Trade item description
 - Batch / lot
 - Trade item quantity and unit of measure
 - Ship from location identifier (i.e. shipping location)
 - Ship date
 - Sender Identification (GLN)
 - Receipt date
- When the packer/repacker’s (inbound) Logistic Unit is the traceable item
 - Logistic Unit identification (SSCC)
 - Ship from location identification (i.e. GLN of shipping location)
 - Receipt date
 - Sender Identification (GLN)

- Ship date
- When the packer/repackers (inbound) shipment is the traceable item
 - Unique shipment identification (e.g. may be the bill of lading number)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)
 - Receipt date
- When your company's (outbound) product (package/case) is the traceable item
 - Trade item identification (GTIN)
 - Trade item description
 - Batch / lot
 - Trade item quantity and unit of measure
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)
- When your company's (outbound) Logistic Unit is the traceable item
 - Logistic Unit identification (SSCC)
 - Ship from location identification (i.e. GLN of a shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)
- When your company's (outbound) shipment is the traceable item
 - Unique shipment identification (e.g. may be the bill of lading number)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship to location identification (i.e. GLN of receiving location/trading partner)
 - Ship date
 - Sender Identification (GLN)
 - Receiver Identification (GLN)

Data attribute definitions are provided in the Glossary (Appendix B).

The accompanying chart further illustrates the minimum data required to maintain traceability.



4.9 Other traceability best practices for Distributor/Trader

- Where the brand of the product belongs to another trading partner (e.g. private label of a retailer):
 - Use brand owner's GTIN's for pre-packaged consumer units or loose produce
 - Label product using a GS1 label and symbology that can be used at point-of-sale
 - Ask for GTINs for all case configurations
- Where the brand of the product belongs to your company please refer to the packing section in 3.0
- Link SSCC number with corresponding GTIN, batch / lot and purchase order information to the outbound shipment details. This should include:
 - Ship to Identification (GLN) and location
 - Purchase Order number
 - Ship-From (GLN) Name
 - Ship-From (GLN) Address
 - Quantity
 - Ship Date
 - Expected Delivery Date by Buyer

Data Retention:

All companies are expected to maintain records that will facilitate timely and accurate traceability and support any product recalls.

It is recommended that your company establish your internal data retention policy based on the following considerations:

- Government or market requirements
- How long your product may exist (somewhere) in the supply chain

- The need to retrieve data in the event of an epidemiological trace-back which may, or may not, implicate your product.

4.10 Business scenarios for distributors/traders

4.10.1 Distributor scenario: Distributor receives imported product from a grower/exporter

Who are the trading parties?

The Best Distribution Company is a re-seller of produce that is sourced from growers/exporters.

What needs to be traced?

The Best Distribution Company traces product from suppliers at the Logistic Unit (pallet) level. Best Distribution also traces logistics units on outbound distribution.

When the product arrives at Best Distribution, it is unloaded and verified against the information previously received. The grower/exporter is expected to place a pallet tag with a SSCC on each pallet which is scanned and verified by Best Distribution.

If the grower/exporter does not place pallet tags on the shipment, Best Distribution does so, using a SSCC it assigns. Likewise, if the grower/exporter does not identify a batch / lot for each case, a unique number such as the shipment identification from the grower/shipper documentation is assigned as a batch / lot.

The product is stored pending sale and shipment to a customer.

Once the pallet is ready to ship to a customer, Best Distribution scans and records the outbound pallet SSCC for each pallet on a shipment/order so they can identify exactly what is on the shipment and the product begins its journey to the next stage in the supply chain.

Best Distribution sends an EDI (EANCOM®) Despatch Advice message to the customer identifying the pallets on the shipment (using SSCC) and the product on each pallet (using GTIN and batch / lot).

4.10.2 Distributor scenario: Distributor receives and re-distributes produce from packers /others distributors/ traders (including cooperatives, brokers, auctions)

Who are the trading parties?

Always Fresh Produce is a large distributor of fresh fruit and vegetables that markets products under the brand names of major packers and under their own "Always Fresh" brand. Always Fresh performs multiple roles within the supply-chain process and has accountability for the receipt and shipment of products that will include traceability data.

The roles that Always Fresh can play in the supply-chain include:

- The receiver of product from the source of goods which can include a field, packing house, or production facility. Consequently, Always Fresh may perform the role of packer, re-packer or distributor/trader.
- The receiver of product from another distributor in the supply-chain. Always Fresh performs the role of distributor/trader.
- A supplier of product to an end customer such as a retail store, restaurant, or other points of consumption.
- A supplier of product to a distribution point that ships the product to a retail store, restaurant, or other points of consumption.
- Receiver of product that is returned or rejected from a supplied entity.

What needs to be traced?

Always Fresh is responsible for the capture, retention and communication of traceability data for the product that is managed. Always Fresh and its trading partners are tracking at the product level.

How do they accomplish this?

The tasks involved with receipt of products include the following:

- At the point of receipt, Always Fresh is responsible for receiving each item ordered with the associated GTIN, batch/lot, quantity received, and date. This information reflects the initial point of control. This data must be captured and stored within a data management system. Always Fresh will expect that the batch / lot information provided by growers can be linked back to the field, packing house, or production of the product.
- If the item received from the source of goods includes multiple batch/lots for the same GTIN, each GTIN and associated batch / lot must be captured and recorded along with the quantity received.
- If the product is received due to a rejection or return, the information for the GTIN, batch/lot, quantity, and receipt date must be captured and recorded. If the product from this scenario is received and destroyed, the information is still captured and recorded.

The tasks involved with the management of product within Always Fresh's facility:

- Following the receipt of products into the facility, Always Fresh will be responsible for the retention of data associated to each GTIN and batch / lot within their facility.
- At the point of picking, it is recommended that Always Fresh captures each GTIN and batch / lot information for the products staged to ship.

The tasks involved with the shipment and transfer of goods from Always Fresh to the receiving entity include:

- At the point of product shipment Always Fresh provides the receiving entity with the GTIN, original batch / lot from source, and quantity for each item shipped.
- This information should be provided in an electronic format EDI (EANCOM®) Despatch Advice message to support the receiving entities receipt.

5 Implementation Guideline for Foodservice Operators/Retail Stores

5.1 Capturing traceability data

Foodservice operators and retail stores must capture product information from their supplier companies. These products are identified using a GS1 Global Trade Item Number (GTIN). The assignment of GTINs for each product traded (i.e. all product configurations) is the responsibility of the brand owner and must be recorded in the foodservice operator/retailer's internal systems prior to product being traded. Use of the GS1 GTIN ensures unique product identification across all of a supplier's product configurations and uniqueness across all sources of supply.

When the trading relationship requires that the inbound product is traceable, this is accomplished by associating each GTIN with its batch / lot. GTIN and batch / lot information is displayed on individual case labels.

Foodservice operators and retail stores may also need to capture information about inbound logistics units, these are typically pallets. Pallets are identified at the time that they are created by the supplier and are individually identified using a GS1 Serial Shipping Container Code (SSCC). This number is assigned by the supplier/shipper and appears on individual Logistic Unit labels. The pallet label provides other important information that must be collected and recorded.

Foodservice operators and retail stores may also need to capture information about outbound shipments to stores, these are typically cases. Cases are identified at the time that they are created by the supplier and are individually identified using GTIN and batch / lot. This number is assigned by

the supplier/shipper or the retailer/foodservice operator and appears on individual case labels. The case label provides a reference that can be traced to the original source. Each order that is shipped to a store should have the linkage between the order, GTIN, batch / lot, and quantity shipped. The retailer/foodservice operator may also create new logistics units and this information must be captured as well.

To enable traceability, foodservice operators/retail stores must also maintain records of other product inputs (e.g. packaging material) for their own use. This information is equally critical to your company's body of internal traceability information.

5.2 How is my company identified uniquely?

The best business practice is to assign a GS1 Global Location Number (GLN) to your company and then share that number with the source of supply. Like the GTIN, a GLN ensures global uniqueness. GLN's can be allocated either by a GS1 Member Organisation or by your company using your GS1 Company Prefix.

Individual GLN's can be assigned to represent your company as well as any individual trading subsidiaries. GLN's can also be used to identify important storage, shipping or receiving locations in your company.

Additional information about GLN assignment appears in Appendix A.

5.3 How does my company identify products in the supply chain?

The best practice is to use the GS1 Global Trade Item Number (GTIN) to identify each traded item.

What is a Global Trade Item Number?

A Global Trade Item Number (GTIN) is a standardized and globally unique way to identify items traded in the supply chain. Where there is a requirement to accurately order, invoice, price or receive your product then the GTIN is the basic enabler. The GTIN provides a common language to support multiple business practices, including traceability.

How is a GTIN assigned to the traded items my company produces?

Where product is sold under a brand name, the brand owner is responsible for assigning the GTIN. If your company is the brand owner, the first step is to approach your local GS1 Member Organization and apply for a GS1 Company Prefix. The GS1 Company Prefix will be globally unique for each organisation and it will be used to create the GTINs assigned to the organisation's trade items. Your company then assigns a GTIN to each one of your products and every packaging configuration. Your company is responsible for communicating GTIN's to your packers.

If your company is not the brand owner, then you must use the brand owner's GTIN.

Where brand is owned by your supplier, the supplier is responsible for assigning GTINs to each configuration of the traded item.

Where can I learn more about GTIN assignment?

See Appendix A.

5.4 How does my company identify produce that must be traced?

The best practice is to identify individual products by their GTIN and associated production batch / lot. The batch / lot is determined by the trading party that created the individual trade item.

5.5 How do my trading partners uniquely identify logistics units?

For foodservice operators and retail stores, inbound logistics units are typically pallets or containers. Where there is a need to trace at the Logistic Unit level, the best business practice is to use the GS1 Serial Shipping Container Code (SSCC) that your source of supply assigned to each Logistic Unit. Each SSCC number is unique to the individual Logistic Unit and is based on your supplier's GS1 Prefix number. This ensures global uniqueness.

Additional information about SSCC assignment appears in Appendix A.

5.6 Best practices for case and logistic unit labels

Guidelines for Case Labels:

When the traceable item is the inbound product, case labels provide a means to identify that product. The label shows the product identification (i.e. the GTIN) and associated batch / lot in an easy to read (human-readable) form and, as a best practice, should also be provided using GS1-compliant barcodes. This ensures cases can be identified quickly and accurately throughout the supply chain, anywhere in the world. Case barcodes (i.e. symbols) conform to a symbology called GS1-128. Your local GS1 Member Organisation can help your company understand how to scan GS1-128 barcodes.

You should note that where the case product is sold to consumers in the case (i.e. the case is sold at retail point-of-sale), then a second barcode symbology will have to be used to enable front end and Point-of-sale scanning. Your local GS1 Member Organisation can also provide assistance on scanning a barcode that can be scanned at point-of-sale.

When the inbound traceable item is the Logistic Unit (i.e. each Logistic Unit needs to be uniquely identified and tracked), refer to the guidelines below for Logistic Unit labels.

Figure 5-1 Examples of GS1-128 case labels



(01) 10614141000415 where (01) = AI 01 (GTIN)

(10) 02228ABC where (10) = Batch / lot

Where can I learn more about creating GS1-compliant barcodes?

See Appendix A.

Guidelines for Logistic Unit labels:

When the inbound traceable item is the Logistic Unit, labels provide a means to identify that shipping container. The label shows the Logistic Unit identification (i.e. the SSCC number) in an easy to read (human-readable) form. Additional information may be shown on the pallet label. This is usually determined through your company's relationship with your suppliers.

The best practice is to provide pallet information using GS1-compliant barcodes. This ensures pallets can be identified quickly and accurately throughout the supply chain, anywhere in the world. Pallet barcodes (i.e. symbols) conform to a symbology called GS1-128. Your local GS1 Member Organisation can help your company understand how to scan GS1-128 barcodes.

Figure 5-2 shows an example of a GS1-128 pallet label uniquely identifying a Logistic Unit.

Figure 5-2 Examples of GS1-128 case labels



(00) 034531200000002527 where (00) = AI 00 (SSCC)

Where can I learn more about creating GS1-compliant barcodes?

See Appendix A.

5.7 What traceability Information does my company need to collect and record

To ensure that the traceability link is maintained, the following data must be collected and recorded. The following represents the minimum data required to ensure traceability with your source of supply.

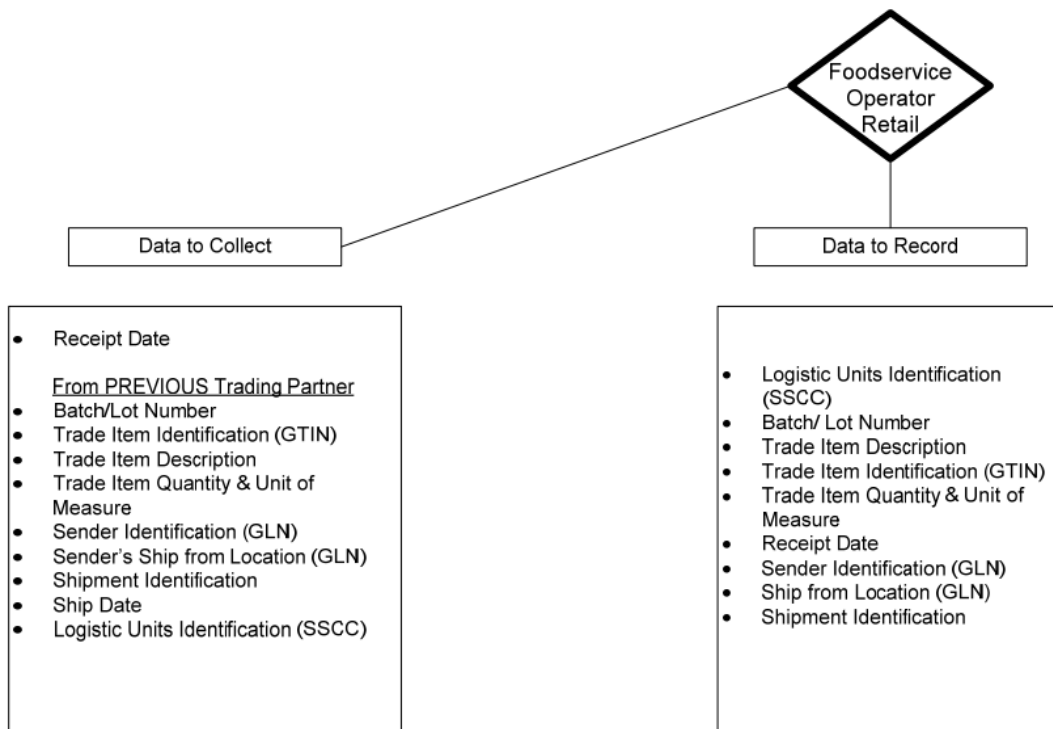
- When the supplier’s product (package/case) is the traceable item:
 - Trade item identification (GTIN)
 - Trade item description
 - Batch / lot
 - Trade item quantity and unit of measure
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship date
 - Receipt date
 - Sender Identification (GLN)
- When the supplier’s Logistic Unit is the traceable item
 - Logistic Unit identification (SSCC)
 - Ship from location identification (i.e. GLN of shipping location)
 - Ship date
 - Receipt date
 - Sender Identification (GLN)
- When the supplier’s shipment is the traceable item

- Unique shipment identification (e.g. may be the bill of lading number)
- Ship from location identification (i.e. GLN of shipping location)
- Ship date
- Sender Identification (GLN)
- Receipt date

Data attribute definitions are provided in the Glossary (Appendix B).

The accompanying chart further illustrates the minimum data required to maintain traceability.

DATA REQUIREMENTS FOR FOODSERVICE OPERATORS/RETAILERS



5.8 Other traceability Best Practices for Foodservice Operators and Retail Stores

1. Scan case barcode for each case received
2. Store GTIN and corresponding batch / lot
3. Receive EDI (EANCOM®) Despatch Advice in order to understand the supplier's shipment in advance of reception. Supplier will:
 - b. Identify each case product using the Product Identification (GTIN) and batch / lot
 - c. Relate each individual case to a Logistic Unit
 - d. Identify each Logistic Unit with a (serialized) SSCC number
 - e. Identify the shipment, including:
 - i. Unique shipment identification (e.g. bill of lading number)
 - ii. Supplier's ship from location
 - iii. Buyer's receiving location

Data Retention:

All companies are expected to maintain records that will facilitate timely and accurate traceability and support any product recalls.

It is recommended that your company establish your internal data retention policy based on the following considerations:

- Government or market requirements
- How long your product may exist (somewhere) in the supply chain
- The need to retrieve data in the event of an epidemiological trace-back which may, or may not, implicate your product.

5.9 Business scenarios for foodservice operator / retail stores

5.9.1 Foodservice operator receives product direct-to-store

Who are the trading parties?

Home Town Restaurants is a small regional restaurant operator. Home Town does not operate a central receiving facility and requires that all suppliers deliver direct to each of Home Town's restaurant locations.

Always Fresh Produce is a large distributor of fresh fruit and vegetables that markets produce under the brand names of major packers and under their own "Always Fresh" brand.

What needs to be traced?

Home Town Restaurants issues a purchase order to Always Fresh on a weekly basis who, in turn deliver to each restaurant location within 24-48 hours.

Always Fresh traces the outbound movement of product and the logistics units used to ship them.

How do they accomplish this?

- Home Town communicates an electronic purchase order message (i.e. using EANCOM®) ORDERS to identify the product (GTIN) and quantity required as well as the restaurant distribution.
- Always Fresh processes the order and builds a single shipment with multiple delivery (drop) locations. Product is aggregated and palletized by delivery location.
- Where product is sold under a packer's own brand, Always Fresh records the outbound movement of the packer's GTIN. Each product case displays the GTIN and batch / lot in barcoded form.
- At the time of picking, each product (case) GTIN is scanned (i.e. both the GTIN and batch / lot) and later associated with a specific customer delivery location.
- A pallet will be built for each Home Town delivery location. Each pallet is designated a unique GS1 SSCC number.
- A pallet label is attached to each outbound pallet showing the SSCC number as well as:
 - Shipper information (Company identification, ship from location, GLN of sender)
 - Consignee information (Company identification, ship to location, GLN of receiver)
- All pallet information is linked to a master shipment record, using the bill of lading number as the master shipment identification.
- Always Fresh transmits an electronic packing slip transaction (i.e. using the EANCOM Despatch Advice message). This document defines the contents of the shipment destined for each of Home Town's restaurant locations. This enables Home Town to reconcile the inbound shipment to outstanding purchase orders and to record all inbound GTINs and their batch / lot.

- As each pallet is delivered to its Home Town store location, the pallet SSCC number is scanned. This enables Home Town to automatically confirm delivery and to update store inventory records.
- In the event of a product recall, Home Town's automated records are able to verify which product batches were delivered to any of their restaurant locations.

5.9.2 Retailer receives product into a central distribution centre

Who are the trading parties?

The Best Produce Company is a regional vegetable supplier serving a large number of customers from a central warehouse. Best Produce's brands have a reputation for product freshness and the Best Produce Company is recognized for operational efficiency. This efficiency has come in part through investment in automated systems and the ability to exchange electronic (EDI) messages with key customers.

Fine Foods is a mid-sized grocery retailer operating a chain of 25 full-line stores. All fruits and vegetables are received centrally through Fine Food's single Distribution Centre.

What needs to be traced?

To ensure traceability between Best Produce and Fine Foods, both companies record the movement of products (GTIN and batch/lot) and logistics units. The efficiency of the order-to-cash process used by both trading partners greatly simplifies the task of traceability.

How do they accomplish this?

Each week, Fine Foods sends an electronic purchase order (EANCOM®) to Best Produce specifying its product requirements for the next 7 day period. Each product is identified using Best Produce's GTINs. Fresh produce shipped to Fine Food's distribution centre is received, inspected and put away for later re-distribution to their stores.

Upon receiving an order from Fine Foods, it is recorded in Best Produce's sales system and a shipping order is relayed to the warehouse. As each case of fresh product is picked and staged for shipping, Best Produce updates their shipping records with product information, including GTIN being shipped, the associated batch / lot(s) and quantity. Each case bears a shipping label showing the GTIN and Batch / lot in both barcoded and human-readable formats. This enables each case to be scanned as it is loaded to an outbound pallet. Once the pallet is complete, it is assigned a unique identification number (SSCC) which is printed on a GS1-compliant logistics (pallet) label together with ship-from and ship-to details. The pallet label is then scanned and an electronic record is created linking the product information with the unique logistics units (SSCC) number.

The information captured by Best Produce's shipping system enables the creation of electronic manifest (EDI EANCOM® Despatch Advice) which can be sent to Fine Foods as soon as the truck is loaded. The Despatch Advice groups shipping data by each (retailer) purchase order number and shows all GTINs being shipped and associated batch / lot shipping quantity and the pallet SSCC number(s) containing that product.

At Fine Foods, the EDI (EANCOM®) Despatch Advice is used for multiple purposes. It assists the scheduling of distribution centre resources, validating ordered merchandise and adjusting in-transit quantities. The Despatch Advice also contains the logistics and product information needed for traceability.

As logistics units are received into fine Food's distribution centre, each pallet label is scanned to confirm receipt. The pallet identification number (SSCC) is cross-referenced to the in-transit information taken from Best Produce's Despatch Advice. This provides Fine Foods with an immediate record of GTINs on the pallet and their associated batch / lot. In the event of a product recall, both Best Produce and Fine Foods have records showing all products exchanged (GTIN and batch / lot) and the movement of each impacted Logistic Unit.

A Reference Documents

A.1 Getting Started

This section will provide further information about the GS1 Global system of Standards.

You are encouraged to follow-up by contacting your local member organization. A listing of local Member Organisations can be found at www.gs1.org.

In this section you will find:

- Introduction to GS1
- GS1 Global Trade Item Number (GTIN) Assignment Further Explained
- GS1 Global Location Number (GLN) Further Explained
- GS1 Serial Shipping Container Code (SSCC) Further Explained
- Enabling Technology Explained
- Other Useful Resources

A.1.1 GS1 Global Location Number (GLN) Further Explained

The GS1 Global Location Number (GLN) makes possible the unique identification of physical locations or legal entities.

A trade relationship may involve several companies; suppliers, customers and possibly a logistic service provider. In each company, several departments may be involved.

Structure of a GLN: A GLN includes 3 components; prefix, location reference and check digit. GLNs can also be obtained by contacting your local GS1 Member Organisation.

GS1 Company Prefix is the globally unique number assigned to a company by a national GS1 Member Organisation.

Location Reference is a number assigned by the holder of the GS1 Company Prefix. The Location Reference varies in length as a function of the GS1 Company Prefix Length. The combined length of the Company Prefix and Location Reference is always 12 digits.

Check Digit is a calculated one digit number used to ensure data integrity.

The GLN is always stored in its entirety. All 13 digits.

Example of a GLN in a GS1-128 barcode



The GS1 Application Identifier (414) indicates that the GS1 Application Identifier data field contains the Global Location Number (GLN) of a physical location.

The GS1 Company Prefix may be of variable length.

The Serial Reference varies in length as a function of the GS1 Company Prefix length.

The Check Digit is a calculated one digit number used to ensure data integrity.

A.1.2 GS1 Further Explained

GS1 is a global standards organization active in over 100 countries. GS1 is dedicated to the design and implementation of global standards for use in the supply chain. These standards provide a framework that allows products, services and information about them to move efficiently and securely for the benefit of businesses and the improvement of people's lives, every day, everywhere.

GS1 standards bring together companies representing all parts of the supply chain – manufacturers, growers, distributors, retailers, hospitals, transporters, customs organizations, software developers, local and international regulatory authorities and more. GS1 standards are used by huge multinational chains and by small corner shops; by world famous brands and by individual craftsmen.

GS1 standards make traceability systems possible on a global scale – no matter how many companies are involved or how many borders are crossed as food and food ingredients travel from one end of the supply chain all the way to the consumer.

GS1 standards can play a vital role in product recalls. Because they are global, reaching from one end of the supply chain to the other, they ensure immediate access to accurate product information, which enables swift, comprehensive recalls.

The GS1 Global Traceability Conformance Program (GTC) will enable companies to have their traceability capabilities recognized by leading companies around the world. Traceability assessments are conducted by GS1 to ensure that the companies implement correctly the GS1 standards. This can help determine if the company complies with the defined GS1 Global Traceability Standard and/or industry extensions.

Companies could use GS1 GTC program to:

- Measure their traceability level.
- Provide management with actionable reports.
- Attain ultimate quality assurance and business optimization.
- Have traceability capabilities recognized globally.
- Provide compliance with ISO-22005.
- Provides compliance with HACCP, BRC and IFS.
- Allows to full traceability requirements of international food regulations such as EC 178-2000, 2002 Bio-Terrorism Act, FDA Food/Sanitation Law of Japan.

Contact your GS1 Member Organisation to determine whether this program is offered in your country.

A.1.3 GS1 Global Trade Item Number (GTIN) Assignment Further Explained

To implement truly effective traceability that is global in scope requires the ability to uniquely identify products and locations with a global standard.

GS1 provides you with this ability through the use of GS1 keys such as a GTIN, GLN and SSCC. This document provides a brief introduction to those keys.

GTIN

The Global Trade Item Number (GTIN) is the foundation of the GS1 System for uniquely identifying trade items, which includes both products and services that are sold, delivered, and invoiced at any point in the supply chain. GTINs provide unique identification worldwide. The GTIN is encountered most frequently at point-of-sale and on cases and pallets of products in a distribution/warehouse environment.

Companies can be confident that a GTIN will uniquely identify their products as they move through the global supply chain to the ultimate end user. This global identification system of GS1 ensures that the GTIN placed in a barcode is the same information contained in the corresponding electronic documents processed between trading partners.

Key Benefits of the GTIN

- Facilitates the global flow of trade items (products and services) and associated information used in electronic commerce
- Uniquely identifies trade items at all levels of packaging (item, case, and pallet)
- Delivers trade item data in a consistent format and structure
- Simplifies supply chain management
- Employs the globally accepted GS1 System whose language is standardized, understood and used by multiple industries

Why is the GTIN Useful?

Uniqueness: The GTIN identifies an item uniquely. The rules for assigning GTINs ensure that every variation of an item (product or service) is allocated a single reference number that is globally unique.

Non-significance: The GTIN numbering structure does not contain any meaningful information in itself. A GTIN is a simple pointer to database information that can be directly used in any company and in any country.

Multi-sector: GTINs are unique across all business sectors. This means that a healthcare product, a grocery product, or an apparel product are all identified in a compatible manner.

International: GTINs are unique worldwide. A GTIN can be assigned anywhere in the world and can be used anywhere in the world.

Data Integrity: The Check Digit ensures the integrity of data passing through the system.

Source Numbering: The GTIN is assigned by the brand owner of the product. Once assigned, all trading partners and internal users can use the GTIN. The same GTIN can be used to identify a series of identical items.

Automatic Data Capture: One of the key benefits of the GTIN is that it can be encoded in many automatic data capture technologies (such as a barcode or electronic product code used in Radio Frequency Identification (RFID) tags. Machine reading allows the information flow to be linked to the physical flow of trade items through the supply chain

GTINs are typically 8 digits, 12 digits, 13 digits, or 14 digits in length. It is recommended that a GTIN be represented in software applications as 14 digits by right justifying and zero filling left, as appropriate.

These GTINs can be represented in a barcode and each provides unique numbers when right justified and used in a 14-digit database field:

GTIN-8

- Seven digits containing a GS1 Company Prefix and the Item Reference Digits assigned by your local GS1 Member Organisation.
- One digit representing the Check Digit

If you require an individual GTIN-8, contact your local GS1 Member Organisation to see if your product meets the GTIN-8 allocation criteria.

GTIN-12

- Eleven digits containing a U.P.C. Company Prefix and the Item Reference assigned by your company
- One digit representing the Check Digit

GTIN-13

- Twelve digits containing a GS1 Company Prefix and the Item Reference assigned by your company
- One digit representing the Check Digit

GTIN-14

- When constructing a GTIN 14 for the identification of packaging, such as cases for fixed weight product, the first digit (with a value of 1 through 8) is an indicator digit. The next 12 digits reflect the GTIN on the consumer item in the case. The last digit is a recalculated check digit.
- Twelve digits the GS1 Company Prefix and the Item Reference assigned by your company
- One digit representing the Check Digit

GS1 Company Prefix – The globally unique number assigned to a company by a GS1 Member Organization. GS1 Company Prefixes are assigned to companies in varying lengths.

Item Reference – The number assigned by a holder of the GS1 Company Prefix to uniquely identify a trade item. The Item Reference varies in length as a function of the Company Prefix length.

Check Digit – A calculated one-digit number used to ensure data integrity. The following illustrates the uses of a GTIN in a barcode.



GTIN-8 symbology

GTIN-8 data structure

Used for point-of-sale identification of pre-packaged, fixed weight/count consumer product. Only assigned by GS1 MO's for use on space restricted products. Not a zero-suppressed number.



UPC-A symbology

GTIN-12 data structure

Used for point-of-sale identification of pre-packaged, fixed weight/count, consumer product



EAN-13 symbology

GTIN-13 data structure

Used for point-of-sale identification of pre-packaged, fixed weight/count, consumer product



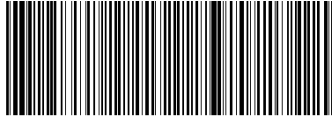
GS1 DataBar symbology (stacked omnidirectional)

GTIN -14 Data structure

Used for point-of-sale identification of loose, variable weight, consumer product

Data Structure holds up to 14 digits. (GS1 has restricted the use of GS1 DataBar at point-of-sale to only include GTIN-12 or GTIN- 13). GS1 DataBar is a new barcode symbology that has been introduced for bilateral use between trading partners beginning in 2010. The global sunrise date for retailers to be able to scan GS1 DataBar is 2014.

There are seven variations of the DataBar symbology. The example shown is the most common related to the identification of loose produce such as apples, bananas, etc. The variations GS1 DataBar Expanded and GS1 DataBar Expanded Stacked can encode additional information such as net weight or price



(01) 3 0614141 000013 (13) 050101 (10) A1B2C3

GS1-128 symbology

Data Structure

Used for trade item identification throughout the supply chain but NOT at point-of-sale.

The GTIN number is 30614141000013

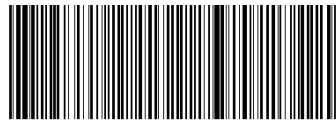
The batch number is A1B2C3

The expiry date is 050101 (YY/MM/DD)

A.1.4 How to Create a Quality GS1-Compliant barcode

Use of GS1 Application Identifiers (AI's):

The GS1-128 symbology allows for the encoding of secondary information. This is done through the use of application identifiers. In the example below the application identifiers is encased in parentheses. The identification (01) indicates that what follows is a GTIN. The identification (13) indicates that what follows is the pack date expressed in the format YYMMDD. The identification (10) indicates the batch / lot.



(01) 3 0614141 000013 (13) 050101 (10) A1B2C3

GS1-128 symbology

Data Structure

Used for trade item identification throughout the supply chain but NOT at point-of-sale.

(01) 3061414100013 where (01) = AI 01 (GTIN)

(13) 050101 where (13) = AI 13 = (Pack Date)

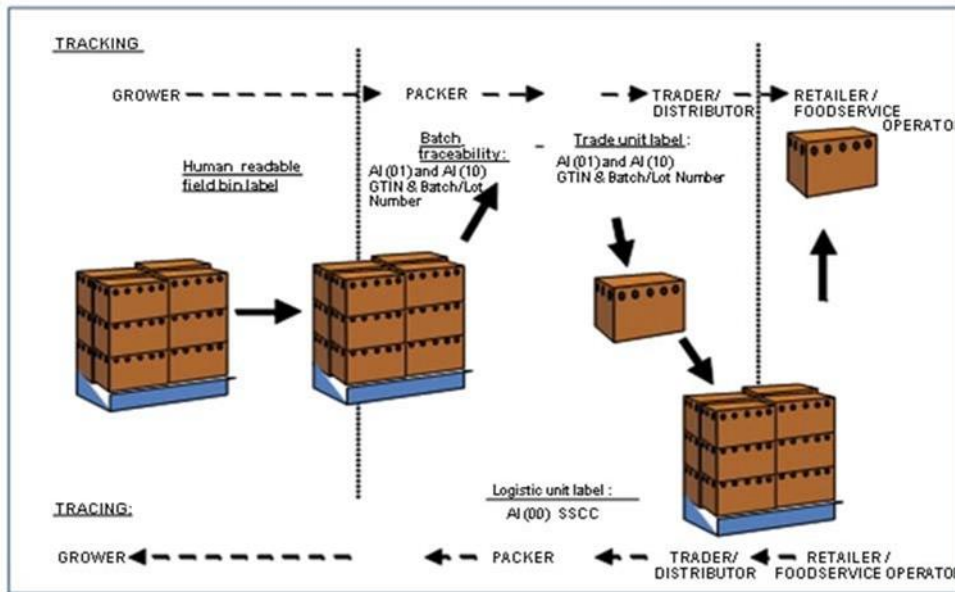
(10) A1B2C3 where (10) = Batch / lot



Note: the parentheses are not encoded in the barcode. For complete technical specifications on the use of GS1 barcode symbologies consult the GS1 General Specifications or contact your local GS1 Member Organisation

The figure below illustrates how the use of GS1 Application Identifiers (AI's) can be applied to product and Logistic Unit labels across the supply chain.

Figure A-1 Use of GS1 Application Identifiers through the produce supply chain



Ten Steps to barcode Implementation:

The following provides a 10 step model to ensuring that your Company produces quality barcodes. Additional assistance can be found by contacting your package/printer supplier or your local GS1 Member Organisation.

- Step 1: Obtain a GS1 Company Prefix
- Step 2: Assign Numbers
- Step 3: Select a barcode printing Method
- Step 4: Select a "Primary" Scanning Environment
- Step 5: Select a Data Carrier
- Step 6: Pick a barcode Size
- Step 7: Format the barcode Text
- Step 8: Pick a barcode Colour
- Step 9: Pick the barcode Placement
- Step 10: Build a barcode Quality Plan

Step 1: Obtain a GS1 Company Prefix

Before a company can begin using barcodes, they must create the numbers that go inside the barcode. These numbers are called GS1 Identification Keys. The first step in building a GS1 Key is to obtain a GS1 Company Prefix from a GS1 Member Organisation. GS1 Company Prefixes are used to identify over 1 million companies today and form the foundation of uniquely identifying everything in the supply chain. To obtain a GS1 Company Prefix contact the GS1 Member Organisation in your country.

Step 2: Assign Numbers

After receiving a GS1 Company Prefix, a company is ready to begin assigning identification numbers to their trade items (products or services), themselves (as a legal entity), locations, logistics units, individual company assets, returnable assets (returnable pallets, kegs, tubs), and service relationships.

The process is fairly simple. Your local GS1 Member Organisation can provide you with specific information about how many numbers you can assign based on the length of your GS1 Company Prefix.

Step 3: Select a barcode Printing Company

To begin, you should decide what you are barcoding and if the barcode will carry static or dynamic information inside it. An example of static information would be simply a product identification number (GTIN) on a box of pre-packaged salad. An example of dynamic information would be printing serial numbers on product labels.

If your barcode has static information and you need a large volume of labels then you will likely ask a printing company to print your labels. If you need a small volume of labels or need to print labels with dynamic information you will likely need an on-demand printer like a laser printer in your office or thermal transfer printer in your warehouse. Knowing how you will print your barcode is an important question to answer in developing a good barcode implementation plan. Again, your local GS1 Member Organisation is there to assist you in making the right selection and many Member Organisations can also help you find a printer in your local area.

Step 4: Select a "Primary" Scanning Environment

The specifications for barcode type, size, placement, and quality all depend on where the barcode will be scanned. There are three basic scanner environment scenarios for trade items:

1. Product package scanned at the retail point-of-sale (POS)
2. Product package scanned in a general distribution
3. Product package scanned at POS but also scanned in distribution

By knowing where your barcode will be scanned you can establish the right specifications for its production. You can find more information in the GS1 General Specifications; available from your local GS1 Member Organisation.

Step 5: Select a barcode

Selecting the right barcode is critical to the success of your barcode implementation plan, but here are some high level tips:

- If you barcode a trade item that will be scanned at the retail point-of-sale (POS), you must use a GS1 data carrier. Label loose produce with appropriate GS1 barcode symbol intended for point-of-sale.
- If you are printing a barcode with variable information like batch / lot, you will use a symbol called GS1-128.

Step 6: Pick a barcode Size

After the correct barcode symbol is specified together with the information to encode in it, the design stage begins. The size of the symbol within the design will depend on the symbol specified, where the symbol will be used, and how the symbol will be printed.

Step 7: Format the barcode Text

The text beneath a barcode is important because if the barcode is damaged or of poor quality to begin with, then the text is used as a back-up.

Step 8: Pick a barcode Colour

The optimum colour combination for a barcode symbol is black bars with a white background. If you want to use other colours, the following may help you in choosing satisfactory ones:

- GS1 barcode Symbols require dark colours for bars (e.g., black, dark blue, dark brown, or dark green).
- The bars should always consist of a single line colour and should never be printed by multiple imaging tools (e.g., plate, screen, and cylinder).

- GS1 barcode Symbols require light backgrounds (e.g., white) which are to the left and right of the barcode
- In addition to light backgrounds, "reddish" colours may also be used. If you have ever been in a darkroom with red lighting and tried to read red copy, you know it can virtually disappear. This is also true of similar colours such as orange, pink, peach, and light yellows. Given the fact that most barcode scanners use a red light source, you can quickly see why these colours may be suitable for backgrounds, but should be avoided for bars.
- In many cases the symbol background is not printed. It is the colour of the substrate that is being printed. If the symbol background is printed beneath the bars, the background should be printed as solid line colours.
- If you use multiple layers of ink to increase the background opacity, each layer should be printed as a solid.
- If you use a fine screen to deliver more ink to the substrate, be sure there are no voids in the print caused by the screen not adequately filling in.

Again, by staying with black bars and white spaces, you have selected the optimal combination, but other colour combinations can be used. Consult an experienced printer or your GS1 Member Organisation for additional guidance.

Step 9: Pick the barcode Placement

When discussing symbol location we are referring to the symbol placement on the design. For symbol replacement guidelines refer to GS1 numbering and barcoding guidelines. In addition the packaging process should be considered. You should consult the packaging engineer to make sure the symbol will not be obscured or damaged (e.g., over a carton edge, beneath a carton fold, beneath a package flap, or covered by another packaging layer).

Step 10: Build a barcode Quality Plan

GS1 members may choose to perform their own quality control of barcode production but today many GS1 Member Organisation offer barcode quality verification services.

A.1.5 GS1 Serial Shipping Container Code (SSCC) Further Explained

There are many reasons to use the Serial Shipping Container Code (SSCC) but the most compelling would be the primary benefit of speeding up your products through the process of shipping and receiving. When used in conjunction with the Despatch Advice, the SSCC allows entire cases or pallets of produce to be scanned and quickly processed through distribution centres and other receiving locations.

The SSCC's a critical element when electronically exchanging information about the movement and location of logistics units. A Logistic Unit is defined as any composition established for transport and/or storage, which needs to be tracked through the supply chain (cartons or pallets). Data exchange and the tracking of logistics units is an application of the GS1 System. This can be accomplished through the use of the SSCC.

The SSCC is the "license plate" to identify specific information about cartons, pallets or even trailer loads of products. The SSCC moves products from one trading partner to another quickly and efficiently. More importantly, the costs associated with moving and receiving products are greatly reduced.

Key Benefits of the SSCC:

- Identifies logistics units with a number that is unique worldwide.
- Links barcoded information on a Logistic Unit and the information that is communicated between trading partners via electronic business transactions such as EDI.
- Employs the globally accepted GS1 System whose language is standardized, understood, and used by multiple industries.
- Applies to the entire supply chain, from raw materials, growers, packers, repackers, distributors and retailers.

- Applies to both intra and inter-company transactions.
- Encompasses a common vendor numbering schema that uses the GS1 Company Prefix so that the number cannot be duplicated.

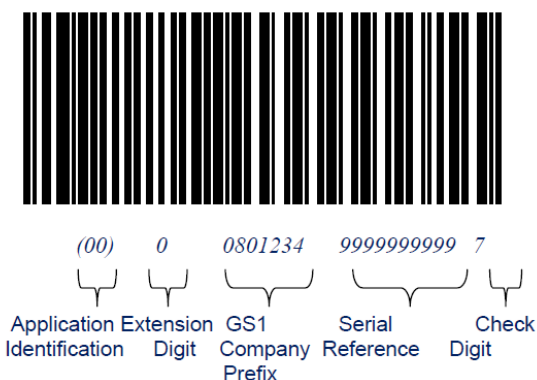
Structure of the SSCC

An SSCC includes 4 components; Extension Digit, GS1 Company Prefix, Serial Reference and Check Digit.

The GS1 Company Prefix may be of variable length.

The Serial Reference varies in length as a function of the GS1 Company Prefix length. The Check Digit is a calculated one digit number used to ensure data integrity.

The SSCC should be stored or encoded in its entirety - all 18 digits. Example of a SSCC in a GS1-128 barcode.



SSCC with 7 digit Company Prefix

A.2 Enabling Technology Explained

The electronic exchange of information is an accepted practice in business and while the produce industry and other fresh food industries may not use it as frequently as other consumer goods industries, its usage and acceptance in produce is expected to increase. GS1 has two official electronic commerce standards. The most established with regards to geographic spread and number of implementations is EANCOM. GS1 XML is a more recent technology that is increasing in popularity.

Also approaching is the acceptance, development and implementation of data synchronization in the produce industry. The GS1 Global Data Synchronization Network or GDSN® enables companies who do business with each other to always have the same information in their systems. Any changes made by one company are automatically and immediately available to all of the other companies who do business with them. Accurate, detailed and up-to-date product information helps both companies and consumers. Brand owners can get new products out to the market faster and more smoothly. Retailers have less administrative work and fewer mistakes in orders and shipments and supermarket shoppers will be able to buy the products they want, instead of seeing an empty shelf. GS1’s Global Data Synchronization Network enables supply chain partners to continuously synchronize information improving efficiency in their supply chains, and to provide better service to the consumer.

GTIN information is conveniently represented by barcodes. The following describes another carrier technology that is being increasingly used to communicate identity information.

Radio-Frequency Identification (RFID) is an automated identification method using RFID tags. RFID tags can be passive, active, or semi-passive. Passive tags have no internal power supply but can be read from a few meters away by another powered device. Active tags have an internal power supply allowing the tag to generate a message to other devices. The range of active tags is hundreds of meters as opposed to a few meters and may include temperature sensors. Semi-passive tags (also called semi-active tags) are similar to active tags in that they have their own

power source, but the battery only powers the microchip and does not power the broadcasting of a signal. Semi-passive tags are more sensitive than passive tags, have a longer battery powered life cycle than active tags, and can perform some 'active' functions (such as temperature logging) under its own power. A key strength of RFID is that these tags can be read without requiring line of sight reading. RFID can provide instantaneous invalidation of incorrect code and is capable of polling large numbers simultaneously. RFID is not human-readable and can ultimately be read and counterfeited without contact.

A.3 Other Useful Resources

Document or Resource	Purpose	Contact
GS1 Traceability Standard – What you need to know	A summary of the GS1 Global Traceability Standard.	GS1: www.gs1.org
GS1 Global Traceability Conformance Programme	An overview of the GS1 global conformance program and how User companies can participate.	GS1: www.gs1.org
GS1 General Specifications	Detailed instruction on how to apply the GS1 system of identification keys and GS1 Application Identifiers for barcoding.	GS1: www.gs1.org

Regional and Local Resources

Additional implementation resources may be available to your company. Please contact your local GS1 Member Organization or trade association.

A.4 Frequently Asked Questions

Why is a company's internal traceability system not enough?

Most companies have their own proprietary internal traceability system that enables them to track product while inside their own four walls. However, most companies do not collect, record or share the traceability information their trading partners require and, therefore, the process breaks down once it leaves their four walls. The other reality is that not every company will use the same traceability system. In order for trading partners to track product up and down the supply chain, companies need to augment (not replace) their internal traceability systems with standardized key information that serves as a link between trading partners' internal traceability systems. The GTIN and batch / lot, at minimum, serve as key pieces of data on each case of produce and are also needed to be stored in each trading partner's databases in order for tracking and tracing to occur quickly.

Why is it important to have the GTIN and batch / lot shown on each case?

The GTIN and its associated batch / lot are, at minimum, the information needed by the packer, re-packer, or shipper to trace the product back to the source. The more information contained in the batch / lot, the more specific the trace back will be and therefore the minimal amount of product implicated. GTIN and batch / lot should be provided in human-readable and machine-readable (barcode) form. In the event of a recall, the human-readable will allow people to physically identify the case in question and remove it from their operation.

Why is it important to have the SSCC and Batch / lot on each Logistic Unit?

The SSCC number and associated batch / lot information are needed by the packer, re-packer, grower or shipper to trace the product back to the source. The more production information represented by the batch / lot, the more specific a trace back will be and therefore will minimize product implicated.

Why is it important to have the GTIN and batch / lot encoded in a GS1-128 barcode?

This allows for the automated capture of this information and eliminates the need for trading partners to manually enter the shipping/receiving data for each case.

The GS1-128 barcode is the most widely accepted barcode in today's food supply chain, one that most retailers/foodservice organizations already have the capability to read and one that has plenty of storage capacity for including both the GTIN and the batch / lot.

Why is it important to record this information?

If a recall occurs citing a specific GTIN and its associated batch / lot, you can now use these two fields to look into your internal traceability system and find the date that specific GTIN combination came into your facility and left your facility. You can then investigate further into your internal traceability system to research what happened in the associated time frame.

Having this information in databases, rather than on paper, allows you to isolate the product in question within minutes. This enables you to quickly determine each handler of the product, when the product was in the possession of each handler and what happened to that product while in each handler's possession.

What is the advantage of one-step-up, one-step-down traceability?

It is critical that each company be able to track where they got product from and where it was shipped. Basic traceability practices are already imbedded in common business processes such as procurement, receiving, storage, manufacturer and distribution. This makes the one-step-up, one-step-down model easy to implement with your company's suppliers and your customers.

What is the advantage of using the Electronic Despatch Advice?

As companies scan and record inbound case information (example, the GTIN and batch / lot) the use of the Electronic Despatch Advice provides a means to expedite the receiving process. The enhanced shipping/receiving process leverages the use of the GS1 Serial Shipping Container Code (SSCC) to identify each pallet uniquely. Information about this pallet can now be communicated both on the pallet (using a GS1-128 barcode) and through an electronic message (using EDI EANCOM®). As the electronic message can be exchanged in advance of the physical receiving of goods, the receiver is able to understand the association of each case to a specific pallet. This process is further described below.

STEP 1: Assign a unique SSCC number to each pallet Encode the SSCC number into a GS1-128 barcode Print the barcode on to a pallet label

STEP 2: Scan GTIN's from every case belonging to that pallet and link to the pallet SSCC number

STEP 3: Apply pallet label to pallet

STEP 4: Send Despatch Advice to trading partner using an electronic message (EANCOM®) Transmit Despatch Advice to receiver as soon as shipment is ready for transport

STEP 5: Receiver receives Despatch Advice and records SSCC number and its corresponding information

STEP 6: Receiver unloads shipment

Receiver scans pallet tag and retrieves SSCC number

Receiver searches internal system for record of inbound SSCC number

Once SSCC number is found, contents of pallet automatically linked to the shipment (GTIN's, batch / lot, quantities)

B Glossary

Term	Definition
Actor	An actor is a role that a user plays with respect to a system.
GS1 Application Identifier	The field of two or more digits at the beginning of an Element String that uniquely defines its format and meaning.
Batch / Lot	The batch or lot number associates an item with information the manufacturer considers relevant for traceability of the trade item. The data may refer to the trade item itself or to items contained in it.
Consumer Unit	The package size of a product or products agreed by trading partners as the size sold at the retail point of sale.
Data Carrier	A means to represent data in a machine readable form; used to enable automatic reading of the Element Strings.
Event	An Event has four dimensions: What: what physical objects were involved (GTIN) When: when the Event took place (timestamp) Where: where the Event took place (Location identifier (GLN)) Why: what business step was being carried out
External Traceability	External Traceability takes place when instances of a Traceable Item are physically handed over from one Traceability partner (Traceable Item source) to another Traceability partner (Traceable Item recipient).
GLN (Global Location Number)	The GS1 Identification Key used to identify physical locations or legal entities. The key comprises a GS1 Company Prefix, Location Reference, and Check Digit.
GTIN (Global Trade Item Number)	The GS1 Identification Key used to identify trade items. The key comprises a GS1 Company Prefix, an Item Reference and Check Digit.
Global Returnable Asset Identifier (GRAI)	The GS1 Identification Key used to identify an Individual Asset. The key comprises a GS1 Company Prefix and Individual Asset Reference.
GS1 System	The specifications, standards, and guidelines administered by GS1.
Identification	Refer to GLN and GTIN
Identification Carrier	Mark / tag / label / accompanying document sometimes called "passport" or "identity card" or "Pedigree" in some industry sectors
Internal Process	A series of actions, changes or function(s) within an organisation or an organisation that brings about a result.
Internal Traceability	Internal Traceability takes place when a Traceability 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.
Link	Recording the information necessary to establish the relationship to other relevant information.
Location	A place where a traceable item is or could be located [ISO/CD 22519]. A place of production, handling, storage and/or sale.
Logistic Unit	An item of any composition established for transport and/or storage that needs to be managed through the supply chain. It is identified with an SSCC.
Master Data	Within the context of Data Synchronisation, any data that is applicable across multiple business transactions. Master Data describes each Item or Party involved in Supply Chain Processes. A Global Trade Item Number (GTIN) or a Global Location Number (GLN) uniquely identifies each data set. Master Data can be divided into neutral and relationship dependent data

Term	Definition
Party	A Party (or) Location is any legal or physical entity involved at any point in any supply chain and upon which there is a need to retrieve pre-defined information. A Party is uniquely identified by a Global Location Number (GLN).
Process	In a GS1 context this refers to a business process. This is a series of actions, or functions that transform an input into an output to assist in meeting an organisation's objectives. Inputs and outputs may be data, physical entities or a mixture of both, examples being order to cash, collaborative planning, warehouse management and cross-docking.
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®].
Quantity	A precise number of articles, pieces or units. Used in conjunction with Unit of Measure.
Receipt Date	GS1 Global definition: Date/time upon which the goods were received by a given party.
Record	Act of creating a permanent piece of information constituting an account of something that has occurred.
Serial Shipping Container Code (SSCC)	The GS1 Identification Key used to identify logistics units. The key comprises an Extension digit, GS1 Company Prefix, Serial Reference, and Check Digit.
SGTIN (Serialized Global Trade Identification Number)	SGTIN is a method of identifying items at the unit or retail level as well as at the case and carton levels. It is composed of a GS1 assigned Company Prefix & Item Reference (GTIN), combined with a Serial Number. Where GS1 barcodes have traditionally been used, the SGTIN specification combined with an EPC 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.
Ship Date	Date on which goods should be shipped or despatched by the Supplier.
Ship from Location	Identification of the party from where goods will be or have been shipped.
Term	Definition
Ship to Location	Identification of the party to where goods will be or have been shipped.
Shipment	A grouping of logistics and transport units assembled and identified by the seller (sender) of the goods travelling under one despatch advice and/or Bill of Lading to one customer (recipient).
Shipment Reference Number	The reference number assigned to a shipment.
Traceability	[ISO 9001: 2000] Traceability is the ability to trace the history, application or location of that which is under consideration.
Traceability Data	Any information about the history, application or location of a traceable item, either Master Data or Transactional Data.
Traceable Item	A physical object that may or may not be a trade item, where there may be a need to retrieve information about its history, application, or location. The level at which the traceable item is defined is dependent on the industry and degree of control required (for example within a product packaging or logistical hierarchy). It could be tracked, traced, recalled or withdrawn. It could exist in multiple locations at the same time (for example, if identified at the trade item and batch level). A traceable item may be related to another traceable item. It is the choice of the Traceability Partner which identification level (e.g. GTIN or Lot/Batch or serial level) to use for the traceable item. See also definition for process



Term	Definition
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 fulfil the original request
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 back" and "tracking forward" are the preferred terms used in this document.
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, Retailer, and Grower.
Transformation	A change to the nature of a traceable item that changes the identity and/or the characteristics of the traceable item. The act of changing the item such as combining ingredients to make a finished product or case picking to create a new pallet. Transformation can be production, aggregation, grouping, splitting, mixing, compounding, packing and repacking traceable items.
Transporter	The Traceability Partner that receives, carries, and delivers one or more traceable items from one point to another without transforming the traceable item(s). Typically only has possession, custody, or control of a traceable item, but may have ownership.
Unit of Measure	The unit of measure relating to a specific quantity. Reference to a unit of measure code that optionally applies to the quantities value. Example of units of measure include pound, metre, kilo.