Inventory Management and Tracking

Reference Guide

National Food Service Management Institute
The University of Mississippi
Item Number ET109-12
2012

Inventory Management and Tracking

Reference Guide

National Food Service Management Institute
The University of Mississippi
Item Number: ET 109-12
2012

This project has been funded at least in part with Federal funds from the U.S. Department of Agriculture, Food and Nutrition Service through an agreement with the National Food Service Management Institute at The University of Mississippi. The contents of this publication do not necessarily reflect the views or policies of the U.S. Department of Agriculture, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. government.

Suggested Reference Citation:

National Food Service Management Institute. (2012). Inventory management and tracking reference guide). University, MS: Author.

National Food Service Management Institute

The University of Mississippi

Building the Future Through Child Nutrition

The National Food Service Management Institute was authorized by Congress in 1989 and established in 1990 at The University of Mississippi in Oxford and is operated in collaboration with The University of Southern Mississippi in Hattiesburg. The Institute operates under a grant agreement with the United States Department of Agriculture, Food and Nutrition Service.

PURPOSE

The purpose of the National Food Service Management Institute is to improve the operation of child nutrition programs through research, education and training, and information dissemination.

MISSION

The mission of the National Food Service Management Institute is to provide information and services that promote the continuous improvement of child nutrition programs.

VISION

The vision of the National Food Service Management Institute is to be the leader in providing education, research, and resources to promote excellence in child nutrition programs.

CONTACT INFORMATION

Headquarters
Administration Division
The University of Mississippi
Phone: 800-321-3054
Fax: 800-321-3061
www.nfsmi.org

Education and Training Division
Information Services Division
The University of Mississippi
6 Jeanette Phillips Drive
P.O. Drawer 188
University, MS 38677-0188

Applied Research Division
The University of Southern Mississippi
118 College Drive #5060
Hattiesburg, MS 39406
Phone: 601-266-5773
Fax: 888-262-9631

ACKNOWLEDGMENTS

WRITTEN AND DEVELOPED BY
Julie Boettger , PhD, RD

GRAPHICS BY
Carole van Almelo
Amy Howell

TASK FORCE MEMBERS
Sincere appreciation is expressed to those who contributed their time and expertise to plan these materials.

REVIEWERS
Sincere appreciation is expressed to those who contributed their time and expertise to review these materials.

EXECUTIVE DIRECTOR
Katie Wilson, PhD, SNS

Table of Contents

Introduction

TERMINOLOGY

Bioterrorism: The deliberate use of biological, chemical, physical, or radioactive agents for the purpose of causing harm.

Foodborne illness: An illness carried or transmitted to people through food.

Hazard analysis and critical control points (HACCP): A food safety system based on principles to identify, evaluate, and control hazards.

Recall: A process used to remove products from the marketplace when there is reason to believe the products may be contaminated, misbranded, or cause health problems.

Standard Operating Procedure (SOP): Detailed written instructions for a process that must be followed to ensure a desired outcome.

Supply chain: The system of interrelated departments, businesses, and agencies through which products, services, and product information flows beginning with raw materials and ending with the final customer.

Time and temperature control for safety (TCS) foods: Foods that need time and temperature controls to prevent a product from becoming unsafe due to biological hazards.

Traceability: The ability to trace the history, use, or location of a product.

Trace back or trace: The ability to determine the origin attributes or history of an item in the supply chain by referencing records held by each entity.

Trace forward or track: The ability to determine the path a traceable product takes through the supply chain on its way to the end customer.

Inventory management has long been considered a critical component of a well-managed school nutrition program. According to a United States Department of Agriculture (USDA) cost study, 46 % of school nutrition program revenue is spent on food (USDA, 2008). Controlling this prime cost has been the focus of classic inventory management practices. More recently, food safety and security issues have added a need for traceability or the ability for schools to trace food products back to their source and trace them forward to the end consumer. The *Inventory Management and Tracking Reference Guide* presents information about inventory management and tracking that may be new to school nutrition operators and updates information about traditional inventory management in light of new traceability expectations.

Recalls of beef, spinach, tomatoes, and peanuts have been in the headlines after sickening hundreds of people. Quick response to trace back to the source of contamination and trace forward to warn potential consumers is crucial for safeguarding public health. More recently, the number and frequency of food product recalls has required school districts to respond to these incidents by identifying recalled products and determining if they have been received by the districts, served, or still in stock.

During the last few years, food safety concerns have driven new initiatives that impact inventory control practices. The Child Nutrition and WIC Reauthorization Act of 2004 requires schools to implement food safety plans based on

Hazard Analysis and Critical Control Points (HACCP). Traceability should be incorporated into standard operating procedures (SOPs) contained in food safety plans because both the source for food products implicated in foodborne illness and the ability to track the storage, production, and service of food products is critical in controlling the spread of illness.

The need to trace and track products is not limited to food recalls and foodborne illness. Security of our food supply has come under scrutiny since terrorist attacks in 2001. In response to potential risk to our food supply from terrorism attacks, Congress passed the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act) that requires all food processing businesses to track specific information about where food was sourced and where it was delivered, also called "one step forward, one step back."

For these reasons, the food industry is taking a fresh look at ways to track and streamline the flow of food and information related to food sales. Although schools are exempt from the Bioterrorism Act, it is important that school districts receive and understand information from their suppliers that ensures the ability to trace and track products within their own establishment. New standards for product identification that schools can use to improve management of their inventory have begun to emerge from these industry efforts.

The ability to track food products across the supply chain is at the center of modern inventory management in school nutrition programs. The goals of this guide are to incorporate food product tracking into standard inventory management practices addressing cost efficiencies, food safety, and effective responses to recalls, foodborne illness, and bioterrorism. This will allow a more proactive approach to food tracking rather than just reacting to recalls. The goals of the *Inventory Management and Tracking Reference Guide* are to:

- identify inventory management best practices;
- provide tools for inventory management;
- introduce traceability and tracking systems; and
- advance traceability practices in school nutrition programs.

Inventory management best practices

Effective inventory control begins before products are purchased. Effective menu planning and recipe development is the first step in inventory management. Menu planning and recipe development should utilize a minimum of products while providing enough variety to maximize customer satisfaction and good nutrition. Procuring, forecasting, ordering, and receiving ensure that the right foods in the correct quantities are received just in time for production. Storage practices keep food secure and minimize waste. Effective and efficient production and service practices ensure that customers consistently receive desired foods freshly prepared, served in correct portions, and in a safe environment.

Tools for inventory management

Good inventory management may require new tools to help one succeed. These tools can be customized to meet the needs of your organization and will give you a quicker path to implementation of recommended best practices. Report templates, bid language, sample standard operating procedures, checklists, and resources are included in this guide.

Traceability systems

Traceability or the ability to track food items back to their original source may be a new concept for employees in school nutrition programs. It encompasses recording delivery dates, delivery agent information, quantity, product codes, and lot numbers for items received by the school, as well as the disposition of the product.

Traceability practices

Although schools are not currently required to keep records that would help them track food products, advancements in product tracking made by suppliers have made product tracking more feasible for schools. Recent incidents of food recalls also may make product tracking a high priority in order to assure the safety of foods served in schools.

Scope and overview

The *Inventory Management and Tracking Reference Guide* takes a systems approach to inventory control by looking at all functions related to inventory management from the procurement process through the service of meals. The individual school nutrition program is part of a large supply chain that starts at the farm and ends with consumption of food and disposal of waste. Most school nutrition programs are at the end of this chain, but districts that supply food to other organizations (day care or senior programs that are outside the school district) may be in the middle of the supply chain with additional responsibility for tracking and tracing food for the organizations they serve. The ability to follow modern inventory management practices depends on having a supply chain point of reference because many effective controls rely on different members, such as manufacturers and distributors, all along the supply chain.

This guide includes information about traditional inventory management practices designed for efficiency and cost control as well as newer inventory management practices such as inventory tracking required for responding to emergencies including product recalls, foodborne illness incidents, and threats of bioterrorism. The information is presented in six chapters: 1) school nutrition supply chain, 2) basis of inventory control, 3) food traceability, 4) best practices in inventory control, 5) standard operating procedures, and 6) responding to recalls and food emergencies.

Organization of information

Each chapter in this guide contains four parts:

- terminology,
- introduction and background,
- special notes for districts with warehouses and/or central kitchens, and
- tools and approaches for three levels:
  - basic approaches that all can/must do,
  - best practices, and
  - advanced approaches or trends (e.g., use of technology).

Reading the *Inventory Management and Tracking Reference Guide* will give you new perspectives on inventory control and resources to help you implement improvements in your inventory management system.

CHAPTER 1

School Nutrition Supply Chain

TERMINOLOGY

External supply chain: Members of the supply chain outside the school district including vendors, brokers, customers, and agencies that handle products or product information.

Internal supply chain: Members of the supply chain within the school district including district-owned warehouses, central production facilities, schools, the central school nutrition office, and the accounting department that handle products or product information.

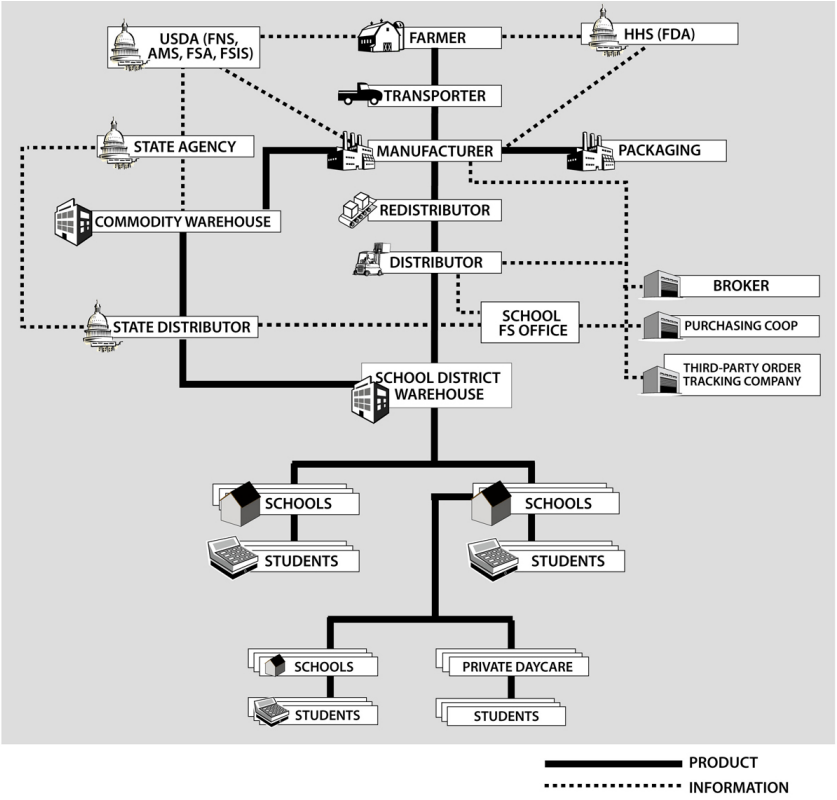
Supply chain orientation: An organization's ability to build and maintain a culture and value system that supports relationships with supply chain partners.

USDA Foods: Foods purchased by USDA for use in school nutrition programs.

Supply Chain Orientation

Historically, school nutrition programs have stayed within their own four walls when considering changes that make their operation safer or more efficient. One of the most recent changes in business strategy is that businesses no longer operate as individual entities, but rather work in partnerships across the supply chain. Although referred to as a chain, this group of entities is better described as a system of interrelated departments, businesses, and agencies through which products, services, and product information flow (Exhibit 1-1).

EXHIBIT 1-1 Example school nutrition supply chain



In school nutrition programs, the supply chain includes internal members throughout the school district. These members may include the central school nutrition office, school kitchens, transportation, business office, purchasing department, and district warehouses. External members of the school nutrition supply chain include suppliers (distributors, vendors, or farmers), state and federal agencies, and perhaps outside customers such as daycare or senior centers.

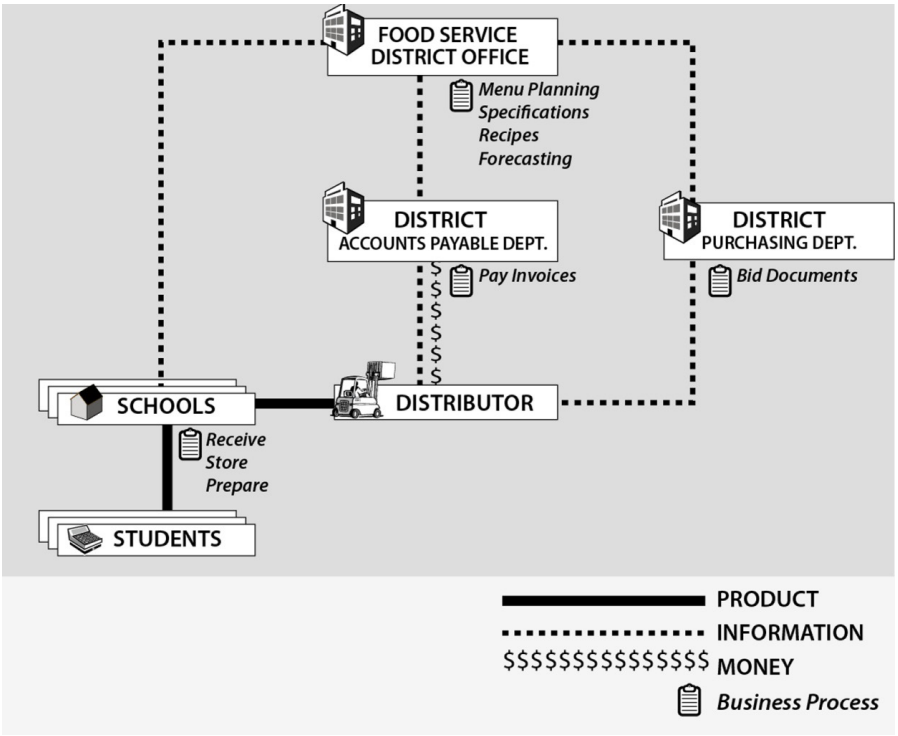
Unnecessary expenses or safety hazards incurred anywhere along the supply chain will increase costs and risks to safety for the end customer. Therefore, a modern approach to inventory management is to reduce the cost of waste and ensure safety across the supply chain while maximizing value to school nutrition customers.

Internal Supply Chain

Internal supply chain members include any unit or functional area within the school district that shares information or products with the school nutrition program. This includes functional areas within school nutrition such as menu planning, purchasing, production, transportation, and service as well as other departments within the district that utilize information about food and supply products such as accounts payable and purchasing. The internal supply chain will be different from district to district and may even be different within a single district based on the type of product purchased.

Mapping out one's primary internal supply chain is similar to mapping the flow of food for food safety plans and is important when considering inventory management improvements. It is unproductive to map out the supply chain of every product; however, it is productive to consider whether or not having multiple supply chain configurations is necessary, or efficient. Internal supply chains for most districts will be simple, consisting of a central office where purchasing decisions are made and sites where food is directly delivered, stored, prepared, and served (Exhibit 1-2).

EXHIBIT 1-2 Example of internal school nutrition supply chain



Note for districts with warehouses or central/base kitchens: Utilizing central production and distribution facilities adds complexity to the internal supply chain. Mapping one's supply chain for commercial food and supplies and USDA Foods can bring clarity to wasted steps in procurement, storage, and distribution. Include transport vehicles going into and out of each facility when mapping the supply chain. Also note whether facilities are managed by school nutrition or another department in the district.

External Supply Chain

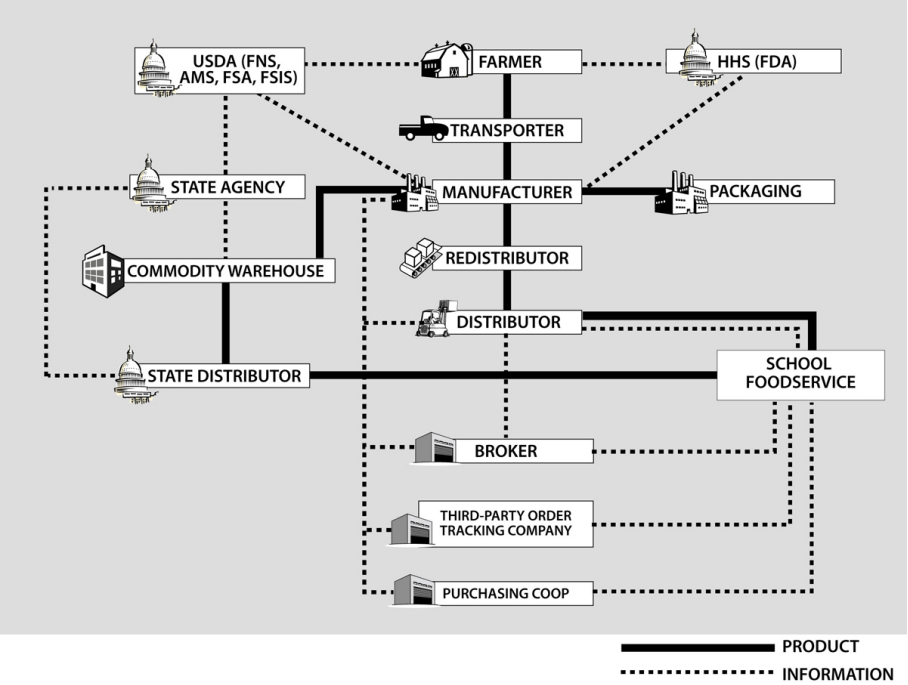
The external supply chain includes any organization that interacts directly or indirectly with school nutrition programs by:

- growing or raising raw ingredients,
- processing USDA Foods and other ingredients into finished products,
- packaging finished products,
- storing food or supplies, or
- delivering food or supplies.

It also includes organizations that share product information with school nutrition programs such USDA Foods product specifications, available USDA Foods and delivery dates from state agencies, brokers, and purchasing cooperatives. The supply chain may include external customers of the school nutrition program such as private day care facilities, charter schools, summer feeding sites, or senior programs.

Similar to the internal supply chain, configuration of external supply chains will vary from district to district. The school nutrition supply chain is complex in large part due to the number of agencies involved with procuring, ordering, processing, storing, and delivering both commercial foods and USDA Foods. Even when the flow of products is relatively simplistic, the flow of information remains complex (Exhibit 1-3).

EXHIBIT 1-3 Example of external school nutrition supply chain



Flow of Information

Although most people think only of the flow of food products when considering a supply chain, the flow of information and services also is a consideration. For example, serving salad dressing manufactured with USDA Foods requires a series of events involving many supply chain members including farmers, manufacturers, distributors, USDA and HHS, the state distributing agency, and perhaps even a third party such as a purchasing cooperative. The ingredients and end product may flow only through the farmers, manufacturers, distributors, into the school district, however, information about costs, ingredients, specifications, and ownership will pass through many more entities adding to the complexity of the supply chain.

Many barriers exist that impede effective communication of essential information among supply chain members including lack of:

- shared understanding of terminology and standardized information such as product codes and other product identifiers,
- knowledge of what information each entity needs, and
- efficient means of transferring information.

Addressing these barriers will help reduce errors, speed the flow of information, and ultimately reduce costs while ensuring that school nutrition programs receive the safe and high quality products they expect. The ability to effectively share product information is essential for traceability and modern inventory management.

CHAPTER 2

Basis of Inventory Control

TERMINOLOGY

Assets: Total inventory stored in schools.

Carrying costs: Costs for transporting, handling, and storing inventory.

Inventory: Food and supplies purchased for an organization but not yet used.

Lot: The batch or lot number that associates an item with information the manufacturer considers relevant for traceability of the trade item (e.g., the time and date the product was manufactured).

Par (Periodic automatic replacement) Value: The amount of product needed to fulfill menu requirements for one ordering period plus a small amount for safety stock.

Safety Stock: A small amount of product kept on hand to accommodate an unexpected rise in customer demand or a late delivery.

Shelf Life: Length of time a food may be stored before safety or quality is diminished.

Shrink: Loss of product due to waste, damage, spoilage, and theft.

Stockkeeping units (SKU): An item of stock that is completely specified as to size, flavor, color, recipe, and any other attribute (e.g., two flavors of gelatin are different SKUs).

Stockouts: Running out of a SKU when there is still demand for the item.

Role of Inventory Management

Food and supplies purchased, but not immediately used (inventories), often represent a significant portion of operational revenue. One classic method of controlling food cost is to maintain inventory levels high enough to ensure menu items can be produced in the right quantity, but low enough to not have excess product sitting in storage. This is called inventory control.

Excess inventory can result in increased waste from foods that spoil, are pilfered, or simply wasted due to overproduction or obsolescence. When inventory is high, it is harder to keep track of what products are on hand, more storage space is required, money is tied up, and it is harder to control waste than when inventory is kept at low levels. This is true for both raw ingredients and finished products. The value of waste may be tracked on production records, or by maintaining a waste report.

On the other hand, not producing enough of each menu item, whether due to lack of raw ingredients or inadequate forecasting, leads to customer disappointment and may violate program regulations. The goal is to have all choices available to students but not have excessive amounts leftover. Although the concept appears simple, it requires careful planning, standardized procedures, and monitoring to achieve desired results.

In the past managers only needed to consider inventory control for their own facility in order to control costs. The age of supply chain management, however, has made school nutrition operators more aware of the cost of inventory

across the supply chain and the effect it has on end costs. Producers, manufacturers, and distributors experience lower margins and waste when anticipated sales do not materialize resulting in excess inventories of product. This cost is passed along to the school district, which is why using predictable buying patterns will lower food costs to schools.

Effective inventory management can achieve several goals. The first is preserving food quality. Receiving the right quantity of product shortly before products are served ensures freshness. Also, training employees to check product codes ensures that products meet specifications resulting in the expected quality. Other goals include:

- maintaining a high level of customer service,
- maximizing efficiency,
- managing finances,
- reducing the space and cost related to storage,
- limiting the loss in the case of recalls or disaster,
- controlling the quantities of food and supplies on-hand, and
- keeping foods safe.

Customer Service

One important aspect of good customer service is to have daily advertised menu items by controlling stockouts. Customers are disappointed when their favorite products run out and when acceptable substitutions are not available. Also, some customers have allergies or other dietary restrictions and their health depends on the right products being available. Substituting a peanut oil for vegetable oil may literally mean life or death for some customers.

Good customer service also requires the delivery of product that is fresh. Although they may be safe to eat, serving products past their use-by date call into question the quality of all products. Serving leftovers resulting from inaccurate forecasting also erodes the perception of quality.

Finally, offering a product mix with enough variety to maximize participation contributes to good customer service. However, it is also important to limit variety to those products that provide sufficient sales in order to maintain operational efficiency. Making small quantities of product increases labor and reduces efficiency.

Efficiency

Another aspect of inventory management is efficient product handling. The design of the facility, especially the location and arrangement of storage areas can affect the ease with which products are delivered to production areas, as well as the security of inventory. Designing inventory forms to match the layout of storage areas can reduce the time needed to count inventory.

Examples of practices that can be used to increase efficiency include:

- reducing the number of items or stockkeeping units (SKUs) that need to be ordered, handled, and stored resulting in decreased handling time;
- eliminating items with low volume;
- consolidating common types or styles of food such as using the same chicken patties for more than one entrée; and
- using purchasing reports from vendors or software systems to determine the number of cases purchased of each item.

Financial Management

One of the most important goals of inventory management is improved financial control. The financial goal of inventory management is to ensure that the maximum value is generated from food and supply investments. In addition to the actual cost of acquiring inventory, costs are associated with transporting and storing inventory. These costs are called carrying costs and may include storage rental, utilities, insurance, cost of shrinkage, cost of obsolescence, cost of wages and benefits for labor to move and count stock, and opportunity cost - how much more you could have earned if the money were spent elsewhere.

> Note for districts with warehouses: In order to determine if you have received products for the lowest cost, it is important that warehouse carrying costs be calculated. A cost per case may then be calculated. The cost per case should be added to the price paid for each case of product to give you a total case cost. This cost can be compared to the price to purchase the same item direct shipped to the school site. The question you need to ask: Is it cheaper for you to manage a warehouse or have a distributor manage the warehousing of food and supplies for you?

According to the National Retail Security Survey (2009), shrinkage in the U.S. is calculated at 1.5% of sales. Shrinkage is the cost of loss due to waste, theft, spoilage, and other product loss. It is estimated that 44% of shrinkage in retail operations is due to employee theft and 35% due to shoplifting. The remaining 21% can be attributed to spoilage, damage, shipping errors, misplaced product, and vendor fraud. Although there are no studies related to shrinkage in school nutrition programs, the use of software for tracking perpetual inventory makes it easier to determine shrink rate in school nutrition programs. Manual calculations are time consuming and may be difficult for most districts. No matter what approach is used, it is important to monitor inventory in order to reduce shrinkage.

Managing Quantities

The correct quantity of inventory is the level at which sufficient product can be produced to meet customer demands – no more, no less. Some safety stock, a small cushion of inventory for unpredicted usage, is necessary to prevent sites from running out of food. For many products, this may mean setting a periodic automatic replacement (par) level or a reorder point. Par levels are usually set for items served daily such as milk, common ingredients used in multiple recipes (e.g., sugar, flour, spices), chemicals, and paper supplies. For entrees, fruits, vegetables, and bread products it is best to project serving quantities for the week's menu.

Common measures of inventory efficiency are the *number of days of inventory on hand* and *turnover rate*. The *days of inventory on hand* and *turnover rate* are calculated:

Ending inventory ÷ average daily food cost = *days of inventory on hand*

Number of serving days ÷ days of inventory on hand = *turnover rate*

A school that receives a weekly delivery for most products should keep no more than 7-10 days of *inventory on hand and* have a *turnover rate* of 2 – 3 (Pannell-Martin, 2005). Both of these metrics can help determine if a school site or warehouse is carrying too much inventory. Setting district goals for these metrics can help site managers better manage inventory.

Food Safety

Food safety is a critical consideration in inventory management. It is very important to protect food inventories from both unintentional and intentional contamination. Proper placement of product in storage areas can ensure that raw products do not cross-contaminate food that will receive no further cooking as well as prevent accidental contamination from chemicals. Standardized, HACCP-based receiving practices protect customers from products that have not been held at proper temperatures or have been damaged during transport.

Recently, intentional contamination or food defense threats such as bioterrorism have caused the need for additional measures. It is important to verify that food and supplies are secured throughout transit and storage. Security practices include recording the names of individuals who handle food as well as locking and limiting access to storage areas and transport vehicles at all times. School nutrition employees must be able to identify:

- product numbers,
- lot numbers,
- when the products were delivered, and
- from whom the product was received.

Procedures must be in place to track and record specific food product numbers and lot numbers from the date received to the date served to customers. A new industry-wide focus on traceability has resulted in a standard method of product identification that is gaining adoption throughout the food industry. The Global Trade Item Number (GTIN) along with a lot number can be used in the event of a foodborne illness, recall, or terrorism threat. This is discussed in depth in Chapter 3.

> Note to districts with central kitchen and/or warehouses: Additional records will be required to ensure that products transported between sites within the school district as well as to sites outside of the school district can be tracked.

Proper storage practices ensure foods are kept safe and shelf life is maximized. Ideal storage temperatures vary based on the type of food. Although refrigerated foods should be held between 32°F and 40°F, temperatures near 32°F may freeze produce whereas this temperature may be ideal for meat and fish. Products requiring colder temperatures should be placed near the back of the cooler where temperatures are cooler. Thermometers should be placed both near the door and at the back of the cooler to adequately monitor proper holding temperatures. Keep in mind that holding temperatures refer to the temperature of the food, not the air temperature of the cooler. Cooler air temperatures should be 2°F below recommended product temperatures.

Interpreting product dating and shelf life can be confusing. Four types of dates may be found on product packaging and each type has a different meaning:

- "Sell-By" is the last date products should be displayed for sale. Although the product may still be safe, the quality starts to diminish once this date passes.
- "Best If Used By (or Used Before)" is peak quality date. It does not mean the product is unsafe or unfit to eat beyond this date.
- "Use-By" is the last date recommended by the manufacturer for consuming the product for best quality.

- "Closed or coded dates" are packing numbers used by the manufacturer. These may be perpetual calendar dates with each day of the year given a consecutive number with January 1 coded as 001 or some variation of a date such as 20100615 representing June 15, 2010.
- It is not unusual for pack dates to be several months before schools receive the product due to harvest schedules. These dates are not intended to be interpreted as "Use By" dates; however, they are often needed for recalls.

None of the four types of dating indicates that a product is unsafe to eat. Ideal food storage temperatures and shelf life for various food products may be found in USDA Use-By Guidance, *Choice Plus: A Reference Guide for Foods and Ingredients*, and USDA Foods Fact Sheets (internet links may be found under Resources).

TERMINOLOGY

Application Identifiers (AIs): A section of a GS1 Data Bar Expanded or GS1-128 bar code found on product packaging enclosed in parentheses used to identify additional information such as weight, count, lot numbers, country of origin, and production date (GS1, 2009 February).

Adulterated: A product that has been contaminated with a foreign substance causing it to be unsafe for usage.

Brown box USDA Foods: USDA Foods labeled with plain USDA labels instead of a commercial label. The name originated from the brown shipping boxes used to ship these products.

Critical tracking event (CTE): A point at which a product is moved between sites, a product is transformed, or any point where a record is required in order to trace a product.

Efficient Foodservice Response (EFR): A voluntary initiative where members of the foodservice supply chain studied methods to eliminate waste and excess cost from the foodservice supply chain.

Global Data Synchronization Network (GDSN): An internet-based network of interrelated databases containing product information and the GS1 Global Registry that allows companies to exchange standardized and synchronized information with their trading partners.

Global Location Number (GLN): The GS1 Identification Key used to identify physical locations such as a manufacturing plant or legal entities such as the manufacturer's corporate office. The 13-digit key is comprised of a GS1 Company Prefix, Location Reference, and Check Digit (GS1, 2009 February).

Global Trade Item Numbers (GTIN): The GS1 Identification Key used to identify products such as a specific brand, unit of measure, and product code. The key is comprised, at a minimum, of a GS1 or GS1 US UPC company prefix and an item identification number (GS1, 2009 February).

Radio Frequency Identification Tag (RFID): An electronic tag encoded with an Electronic Product Code (EPC) used to identify products within a supply chain. The 14-digit GTIN number was designed so that it could be used as an EPC code in RFID tags.

Universal Product Codes (UPC): A bar code with a 12-digit GTIN used to uniquely identify a product and the company that owns the product brand.

Current Climate

Since the terrorist attacks in 2001, the ability to track the source of foods and the hands that products have passed through on the way to consumers has been a concern. The vulnerability of the food supply provides opportunities for intentional contamination of food. In the last few years, the need to track food has intensified due to large-scale recalls of products such as beef and peanuts. The need to identify the source of foodborne illness and reduce the risks associated with contamination, improper labeling, and product tampering are making traceability an emerging issue. The agriculture and food industries are linked through traceability. Take the example of a school that receives ground beef. Is

it beyond the realm of reality to expect that the ground beef could be traced back to a specific herd of cattle or even a specific animal within 48 hours? We may be closer to this reality than you think! Technology provides the capability to identify and track animals as they are transported from their origin, through processing, and delivery to school nutrition operations.

What is Traceability?

Traceability is the ability to track a specific food within the supply chain, ideally from "farm to fork". It requires keeping sufficient records within each establishment that grows, processes, or handles food throughout the supply chain to be able to trace back from any point where the food originated or trace forward to find who purchased the product. This capability requires that each member of the supply chain keeps a detailed record of cases of product they purchase, as well as cases of product that they sell.

In order to implement traceability, organizations across the supply chain need to be able to identify food items, capture the information accurately, and share the information with other supply chain partners. This activity requires standards for all three functions. First, all supply chain members must be able to identify products using a common description or number such as Global Trade Item Number (GTIN). Then information needs to be accurately captured in a standard format that identifies the type of data to collect. Finally, this information needs to be stored in a manner that it may be shared with others, for example, a comma delimited file, spreadsheet, or database. A good example of standardization used for electronic transfer of information may be found on the Produce Traceability Initiative (PTI) website listed in the resource section of this guide.

Federal Oversight Priorities

At the federal level, the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA) share food safety responsibilities through various agencies within their departments. The Environmental Protection Agency (EPA) provides oversight for the public water systems. The Department of Homeland Security (DHS) becomes involved if terrorism is suspected. The Department of Defense (DOD) could be called if an incident occurred in a DOD school or if the DOD fresh produce program were involved. Unprecedented communication and cooperation among these agencies has occurred over the past few years as the vulnerability of our food supply has been questioned.

The Food and Drug Administration (FDA) of HHS and USDA's Food Safety and Inspection Service (FSIS) have responsibility for regulating the U.S. food supply to keep food safe. FSIS is responsible for inspecting and regulating meats, poultry, egg products, and catfish and FDA is responsible for all other food products. In addition, there are many state and local agencies that also inspect and regulate food processing. Any of these agencies may determine that a product has been contaminated or adulterated and request that the manufacturer initiate a recall, however, FDA has the power to require a food product recall if efforts to get the manufacturer to issue a voluntary recall are unsuccessful.

In the event of a problem that involves USDA Foods, these agencies involve the Food and Nutrition Service (FNS), the Agriculture Marketing Service (AMS), or the Farm Service Agency (FSA) to help determine if USDA Foods are involved either through the brown box program or a national processing agreement. If it is suspected that USDA Foods may be involved in a recall, the state distributing agencies are contacted by FNS because they are the initial recipients of these products. The state distributing agency will then contact the recipient agencies that received the product. DOD may also be involved in the recall if produce they purchased is recalled.

Although several industry initiatives, such as the Foodservice GS1 US Standards Initiative, Produce Traceability Initiative, and the mpXML Group (Meat and Poultry), are underway to improve food traceability, FDA and FSIS do not have the power to enforce expanded traceability. Both agencies are actively involved in voluntary traceability initiatives as well as new tracking policy legislation included in the Food Safety Modernization Act of 2010 (FSMA) that requires

FDA, in consultation with USDA, to establish a product tracking system to rapidly track and trace food that is in the United States.

The Bioterrorism Act of 2002 requires any company that manufactures, processes, distributes, receives, holds, or imports food products to keep records on the source of food and the recipients of food from their establishment. This is often referred to as "one step back, one step forward" because the company goes one link back in the supply chain and one link forward. When there is reasonable belief that food is adulterated, companies are required to allow FDA and FSIS access to these records within 24 hours if requested. Non-profit food establishments are exempt from establishing new records, but still must produce existing records when requested.

Although companies may comply with the "one step forward, one step back" provision of the Bioterrorism Act, governmental agencies coordinate the tracing in the event of an incident such as a foodborne illness outbreak. If we do not enable these agencies to do their jobs effectively, then more people may be exposed to foodborne illness. If everyone has different information tied to the product, or if information is not consistently stored in their systems, the tracking done by the government agency will be protracted due to inconsistent information, inconsistent record keeping, manual records, and proprietary standards. The longer it takes an agency to perform trace back, the larger and broader the recall becomes. This means that it is not only important to capture information associated with product tracking it must be stored in a manner that makes it easy to share with other members of the supply chain.

Voluntary Initiatives

For over 40 years food companies have standardized product identification in the grocery industry by using Universal Product Codes (UPC). This practice has led to greater efficiency in the grocery industry. Hoping to achieve similar results in the foodservice sector, several industry groups representing manufacturers, distributors, and restaurants began an initiative called Efficient Foodservice Response (EFR) for the purpose of educating supply chain members in traceability for the purpose of improving efficiency. Their efforts led to the voluntary adoption of GS 1 GTIN for food products and Global Location Numbers (GLN) to identify company locations. The use of GLNs help with traceability efforts by identifying the precise location where products originated and also where they have been shipped.

Today the Foodservice GS 1 U.S. Standards Initiative (Foodservice Initiative), endorsed by most industry groups representing food manufacturers, distributors, and school nutrition operators strives for GTIN numbers to be placed on cases of product and in buying guides by 2011. Although the 12-digit UPCs are a GTIN, food manufacturers are standardizing on a 14-digit GTIN commonly found on cases that can be captured electronically through bar codes and radio frequency identification (RFID) tags. The 14-digit GTIN, when used with application identifiers (AIs) in bar codes such as the GS1-128, can also track product information such as the lot, country of origin, use-by dates, and net weight making the number much more versatile and useful.

Recalls have hit the fresh produce industry especially hard with growers and processors losing millions of dollars from disposal of products later found not to be involved with food safety issues. In 2008, tomatoes were thought to be the source of a *Salmonella Saint Paul* outbreak that sickened over 1,400 people. Although each company had records available to trace tomatoes back to the field, the lack of compatible electronic records slowed the process resulting in several months of wasted time before FDA realized that no common source existed to implicate tomatoes. Motivated by these losses, industry traceability initiatives such as the PTI have accelerated from obscurity to mainstream as fresh produce packers who are PTI members prepare to label all produce cases with a scanable GTIN plus lot or batch number by 2011.

mpXML, a group of leading meat and poultry suppliers and retailers, is also using the GS1 standards used by both

the PTI and the Foodservice Initiative. All three groups have taken voluntary steps toward identifying products at the case level using GTIN plus lot numbers and GS1-128 bar codes. The mpXML and PTI have already adopted standards for cases and pallets using the GS1-128 bar code and the Foodservice Initiative is expected to do so as well. The goals for all three initiatives are to minimize waste in the supply chain, improve product information for customers, and establish a foundation for improving food safety and traceability.

Legislation

The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act) brought new focus on the ability to trace all foods sold in the U.S. from the source to the end user. This act standardized the information that was to be kept including product and lot numbers, date of delivery/date of shipment, and the names of those who came in contact with the food item. Although this provided data needed to trace products, each company had the option of storing the data in any form that was convenient such as on invoices or other paper formats as well as electronically. Although each company could trace products it received or shipped, lack of a common data format and electronic means of sharing the information slowed traceability efforts.

More recently, the Food Safety Modernization Act of 2010 further strengthens the effort to track foods by requiring FDA to establish a food tracking system to improve the ability to track and trace food products rapidly. Although provisions of this law generally do not pertain to meat, poultry, and egg products, the Secretary of Agriculture stated the Administration is reviewing the Federal Meat Inspection Act and that it is possible that food safety reforms adopted by FDA may also be proposed and adopted by USDA and approved by the next Congress.

Benefits

The biggest benefit from incorporating traceability in schools is cost savings. When recalls occur, products from the same manufacturers or with the same ingredients unrelated to the recall are often pulled or destroyed "just to be safe." When students and other customers perceive a problem with a recalled food type, they often will not buy any product similar to the recalled item. When this boomerang effect occurs, millions of dollars of food is unnecessarily removed from the food supply and ultimately the costs are passed along to the schools and other establishments. If schools are specific about which foods are involved in a recall, react quickly to recall notices, and provide assurances about the safety of related products, damage and costs are reduced.

Additional savings come from greater efficiency. When coupled with technology such as bar code readers, the scanning of GTIN numbers can potentially save money on tasks related to ordering, inventory, and receiving. One study conducted by A.T. Kearney (International Food Distributors Association [IFDA], 2006) found that retailers reduced inventory by .5 - 1.0%, stockouts by 2 - 4%, and reconciliation errors (e.g., invoice discrepancies) by 5 - 10% when using bar code readers.

Scanning bar codes requires inventory and ordering software with the ability to store GTIN numbers for a case or purchase unit. For complete traceability, software also needs the capability of storing lot numbers for each case of product received. A hand held scanner that is capable of reading GS1-128 or GS1 ITF-14 bar codes is also required. These bar codes are described later in this chapter under Item Identification. The database used by the software must be capable of exporting data in forms (e.g., comma delimited file) that can be shared with supply chain partners.

Scanning products during the receiving process will not only record the product codes and lot numbers but provides the ability to check these numbers against purchase orders to ensure that the correct products were delivered. Scanning bar codes when taking inventory eliminates manual data entry required when a spreadsheet or software is used alone.

Even paying invoices can be automated when accounting departments are equipped to electronically share information about received products rather than entering invoices into financial systems for payment. Scanning product codes increases both accuracy and efficiency.

In addition to food safety and efficiency, the ability to trace foods also ensures that attributes such as organic, locally grown, country of origin, genetically modified foods (GMO), allergen-free, and other qualities that are impossible for consumers to detect from examining products are delivered as specified. Manufacturers are beginning to populate the Global Data Synchronization Network (GDSN) with this type of information in order to electronically synchronize standardized product information with their sales agents, brokers, distributors, and ultimately with operators such as those in school nutrition programs. The GDSN is a network of data pools containing item, location, and price information from trading partners subscribing to the network using standardized information such as GLNs and GTINs.

Major food manufacturers are beginning to populate GDSN with pack size, nutrition information, allergens, and other information often required by schools. When schools show an interest in using the GDSN, it will raise the priority for manufacturers to populate the database with school products. Because schools are customers of the organizations implementing these traceability initiatives, they are well positioned to take advantage of these efforts.

Barriers

Because electronic tracking is new to schools, the initial costs may be higher than some school districts can afford. It is also typical that early adopters of technology may have to deal with imperfect software and other glitches. It may not be for everyone.

In order to take advantage of scanning, the school district would need to invest in both hardware (e.g., scanners) and software that can store and share product numbers. Vendors currently providing ordering and inventory software to schools may not have the ability to scan bar codes making it difficult to implement electronic tracking. Funding for such purchases may be justified based on potential cost savings, especially in larger school districts.

Although there are many manufacturers and distributors that have already begun using GTIN numbers on cases of food products, there may be many others who have not yet taken that step. School personnel may find it frustrating to continue using manual systems for products from certain vendors when other vendors are using GTIN numbers.

Get Ready For the Future

The Foodservice GS1 US Standards Initiative has set goals for participating manufacturers to communicate product information to the GDSN and for distributors to scan GTINs and lot numbers on all outbound cases by 2012. This will enable operators to begin receiving product information electronically and scanning inbound cases from industry partners participating in the Foodservice GS1 US Standards Initiative shortly thereafter. Companies currently participating in this initiative are listed on the Foodservice GS1 US Standards Initiative webpage. The link for the webpage is listed in the resources section of this guide.

Preparing to participate in this initiative will require following inventory management best practices described in this guide as well as preparing for the electronic exchange of information with industry partners. Implementing business practices that standardize product information and ensures product tracking within the school district is the first step in preparing for electronic data sharing.

To prepare for electronic information exchange through the GDSN, school districts should:

1. Specify that vendors include GTINs on product cases;

2. specify that vendors include GLNs on shipping documents, and invoices;
3. select software vendors that store GLNs and GTINs in their system and have interoperability with GDSN-certified data pools;
4. select scanning hardware that can read GS1-128 and IFT-14 bar codes;
5. obtain GLNs for school district and each location receiving products or product information.

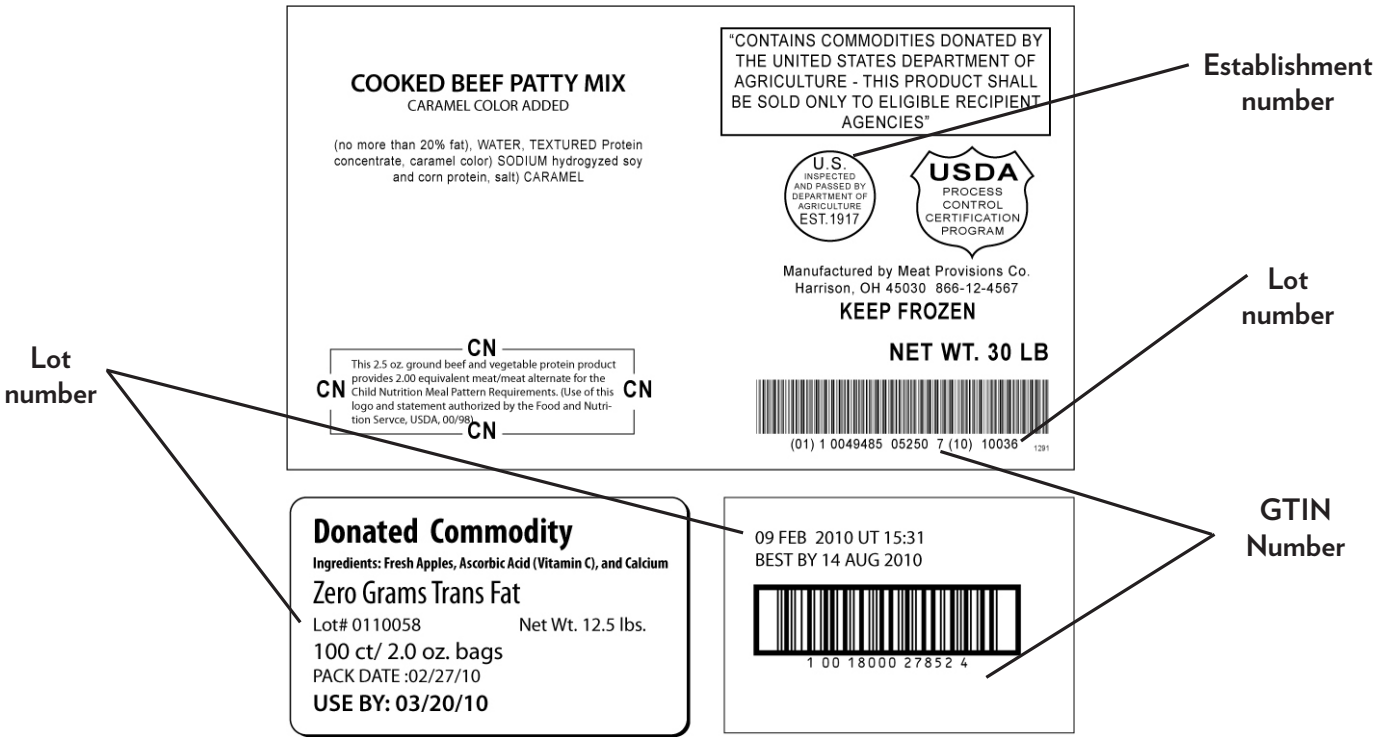
In order to assign GLNs for each location, first contact GS1 customer service to obtain a company prefix. Next, assign location numbers to each location that will either receive products or product information such as schools, accounts payable, and warehouse. The company-prefix and location number together comprise the GLN. Each school district should be identified by only one company prefix so it is important to communicate with school district administration to coordinate the efforts of different school district departments to avoid duplication. Although there is a small annual subscription fee for each GLN number, larger districts may find it less expensive to annually subscribe for a company prefix and then assign their own GLNs.

Item Identification

The basic requirement for manual or electronic traceability is the ability to accurately identify products. If using an electronic tracking system such as bar coding, a 14-digit GTIN plus lot number is the most common method of identifying products. Manual systems will use a variety of case coding depending on the manufacturer. For food recalls, additional information must be gathered for the batch or lot regardless of the type of tracking system used. Even if an electronic system is implemented, not all manufacturers have adopted GTINs so a combination of automated and manual processes will be needed.

Manual case markings will be different depending on the type of food product. Meat, poultry, and egg products will have an establishment number located inside the USDA inspection seal (Exhibit 3-1). The package will have a lot or batch number or "use-by date" that identifies when a product was manufactured.

EXHIBIT 3-1 Examples of common case markings



Once an operator learns to read and understand bar code numbers, these numbers may also aid in product identification. Products manufactured by companies that have adopted GTINs will have a 14-digit number and bar code on the case as shown in Exhibit 3-3. One digit will differentiate the packaging levels, one is a placeholder, and twelve digits will represent the unique company prefix and item reference number (Exhibit 3-2). A GS1 Company Prefix (identifier) can vary from six to nine digits; the length of the Company Prefix determines the number of digits a company has available for its Item Reference numbers; the shorter the prefix; the more Item Reference numbers that are available for use. The final digit is a check digit that is used to ensure the product scanned correctly.

EXHIBIT 3-2 GTIN coding scheme

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Indicator Code	Placeholder	Company Prefix						Item Reference					Check digit

Indicator codes will be zero (0) if inner packages have different item reference numbers and one (1) when the case and item references are the same. When the indicator code is 0, school operators need to be aware that inner packs will not have the same item reference number as the case or shipping container and extra care will need to be taken to ensure that correct item references are recorded. An indicator code of nine (9) represents a product with a variable weight (e.g., turkey ham where each ham has a different weight).

Manufacturers choosing to use a GS1-128 barcode have the option to add a lot number next to the GTIN (Exhibit 3-3). Manufacturers also have the option to add net weight and other information by stringing along additional numbers identified by application identifiers (AIs) (Exhibit 3-4). Application identifiers have the potential to provide school districts with more accurate information about country of origin and other attributes.

EXHIBIT 3-3 Examples of Global Trade Item Numbers

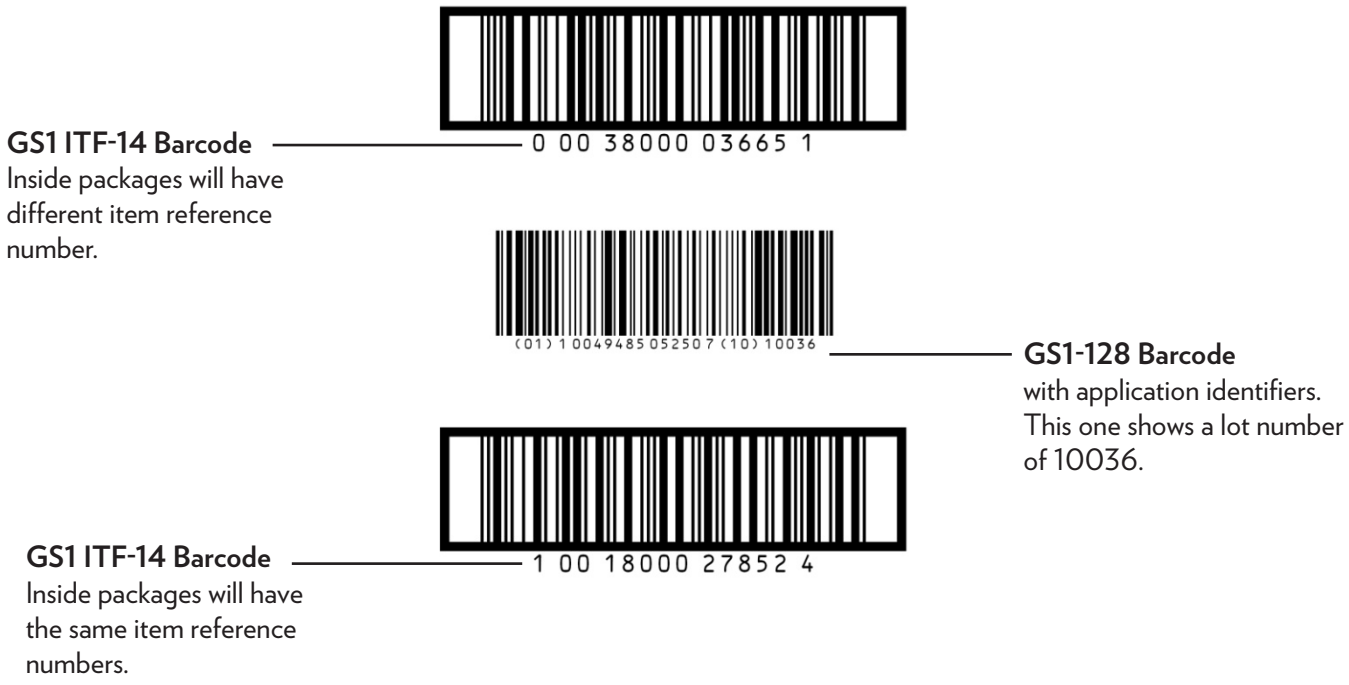


EXHIBIT 3-4 Common Application Identifiers

AI	TITLE
01	Global Trade Item Number
10	Batch or lot number
11	Production date (YYMMDD)
15	Minimum durability date or "sell-by" (YYMMDD)
17	Maximum durability date or "use-by" (YYMMDD)
30	Variable count
320(n)	Net weight (lb), n = decimal placement
422	Country of origin

School nutrition personnel need to be able to identify products for a variety of reasons. Subtle differences in products can affect pricing, nutritional integrity, and compliance with school nutrition regulations, or the food product may contain allergens that can be harmful to affected customers.

When products are purchased, the product number or GTIN and any acceptable substitutions must be available to personnel receiving deliveries to ensure that products ordered are the ones received. Cooks and production employees also need to read product codes to make certain that prepared products match production records and recipes. In the event of a foodborne illness, school records must be sufficient to track products served on specific dates, and meals to ingredients and sources. When recalls occur, specific products must be identified as to date received, used, disposed of, or sequestered.

Voluntary Standards

Some school districts are addressing organizational quality by adopting standards such as International Organization for Standardization (ISO) standards and Safe Quality Food Institute (SQF) standards or including these standards as requirements for vendors in bid documents.

> Note for district with centralized production: Although ISO and SQF standards will benefit all school nutrition programs, districts that operate centralized food production facilities may have the greatest benefit due to the increased risk when producing a large volume of meals in one facility.

ISO standards are available for many different types of organizations, including school districts, and a variety of processes including ISO 22000:2005, food safety management systems. ISO defines standard operating procedures, monitoring systems, adequate recordkeeping, corrective actions, and feedback mechanisms to ensure procedures are effective. This process is very similar to food safety plans based on Hazard Analysis and Critical Control Point (HACCP) recently added to National School Lunch Program regulations.

Companies may elect to be ISO or SQF certified by adopting these standards and participating in periodic audits, however, you do not need to become ISO or SQF certified to implement standards that will improve program quality. Both ISO 22000:2005 and SQF 2000 include traceability standards for food products requiring product codes and lot or batch numbers to be recorded throughout internal processes as well as among supply chain members.

Critical Tracking Events and Recordkeeping

A critical tracking event (CTE) is a point at which a product is moved between sites, a product is transformed, or any point where a record is required in order to trace a product. In a school nutrition program where all food is delivered directly to a school site for production and service, CTEs would include the point at which a product is received, the point at which the product is used in food production, and the point at which the product is served, stored, or thrown out. If the product is stored as a leftover, two additional CTEs occur for reheating and serving or disposal. CTEs will be marked in this document with  to indicate a process when critical information about the product must be recorded.

The ability to trace products depends on the ability to capture data about the product at each CTE point. Data that must be captured include date, location(s), product code, quantity, and lot number. The manner in which data are stored is up to the school district. At a minimum, schools need to record sufficient information on invoices or receiving documents and production records. Programs with more complex delivery and production methods will have more CTEs.

> Note to districts with warehouses and/or central kitchens: When food is shipped from one location to another, such as between schools or centralized storage or production facilities, additional recordkeeping is necessary. Data need to be recorded for each shipment received as well as each shipment out of the facility.

Internal and External Traceability

Internal traceability refers to processes within a school when data should be collected in order to trace a product, including transforming the product into a finished product. Processes such as cooking, serving, and disposal or destruction of the product are all considered internal traceability processes.

External traceability refers to a physical exchange of product between two supply chain members such as a distributor, a state USDA Foods warehouse, or a contracted receiving site such as a day care and one or more locations within the school district. It also refers to transfers within a district when products are shipped from a warehouse or central kitchen to a school or between schools.

The source location must provide the recipient with at least one identification number such as the GTIN and the recipient must keep this identification attached to the item until the product is used or destroyed.

Best Practice: Use GLNs and GTINs on all purchase orders. Require vendors to use GTINs on advance shipping documents and GLN and GTINs with lot numbers for their products on all invoices. Internal shipping documents and production records should also use GTIN and lot numbers for items produced and/or shipped within the district and to entities outside of the district.

Role of Technology

GTIN numbers are designed so that they can be encoded into bar codes or electronic product codes (EPC) such as radio frequency identification (RFID) tags in order to be read by electronic data capture devices such as scanners. RFID is a technology that shows great promise but it is not readily available for school nutrition application and is too expensive to consider for school districts at this time.

On the other hand, bar code technology is relatively inexpensive, bar codes are encoded at the case level for most food products, and scanners with the ability to read all GS1 and other bar codes are readily available. Ideally software already in use by school nutrition programs for ordering, receiving, inventory control, production, and point-of-sale will incorporate tracking capabilities enabling schools to capture GTIN and lot numbers.

Reports from these systems should summarize the disposition of a given product code and lot number, by location, within a specified date range including the ability to be exported electronically for submission to a state agency in the event of a USDA Foods recall or to FDA or other authorities in the event of a commercial recall, foodborne illness, or bioterrorism event.

The cost effectiveness and efficiency of such a system will depend on the complexity and size of the school nutrition program. In a small district where food is primarily delivered to each location, manual systems will suffice as data can be gathered, reviewed, summarized, and reported to the requesting agency quickly. In larger or more complex programs where data are collected at many processing points and locations, an electronic means for collecting and reporting data may become essential in order to provide full traceability.

Electronic capture of the GTIN plus lot numbers is more efficient than tracking lot numbers manually. Products may be scanned when they:

- arrive from vendors,
- are placed in or removed from storage,
- are shipped to other buildings, and
- are discarded.

When selecting software vendors, ensure the software can provide reports filtered for a given GTIN and lot number and sorted by location and date.

CHAPTER 4

Best Practices in Inventory Control

TERMINOLOGY

Batch Cooking: Preparing smaller quantities of food as needed throughout the serving period rather than preparing the total quantity needed at one time.

Cycle Menu: Menus that are repeated over a specified period of time.

Cycle Counts: Physical count of a small group of randomly selected products on a periodic basis. Typically used in high volume operations when a monthly physical inventory may not be possible.

Indirect Discount: Applying a discount for the fair market value of USDA Foods on processed products on the invoice; also referred to as "net off invoice".

Par Value: The amount of product needed to fulfill menu requirements for one ordering period plus a small amount for safety stock.

Perpetual Inventory: Continuous recording of all receipts and issues of products in storage providing a balance of each item at all times.

Physical Inventory: Periodic actual count of products in storage areas.

Single Inventory Method: Maintenance of a single inventory for food and supplies, including USDA Foods.

Standard Operating Procedure (SOP): Detailed written instructions for a process that must be followed to ensure a desired outcome.

School nutrition programs across the country have different methods of achieving the same goal: serving nutritious, cost-effective meals students will enjoy. Some methods, however, stand out as "best practices" or procedures that when followed achieve consistent high quality results. This chapter identifies "best practices" that are related to inventory management and product tracking.

Typically, inventory management is addressed as a function or discrete set of tasks. In this chapter we approach inventory management from a systemic or holistic view looking at the impact each function in the school nutrition program has on the management of inventory. Inventory management ensures that quality, cost effective products are available in the right quantities at the right time.

Similar to strategies used in Efficient Foodservice Response (EFR) initiatives to take advantage of supply chain management and inventory management efficiencies, it is important to:

- assemble a cross-functional team including representatives from purchasing, operations, accounting, and technology;
- educate the team on how inventory management is affected by each department;
- develop a plan with a vision for improving management of inventory to improve cost, efficiency, traceability, and safety; and
- develop metrics (e.g., food cost, inventory turns) that may be used to benchmark starting points and measure progress.

Menu Planning

Menu planning is the underpinning of inventory control because the menu establishes what items are needed and how frequently they are going to be used. Effective menu planning requires considerable planning and skill to ensure that menus are cost effective, popular with customers, and meet nutrition and program guidelines. It is unlikely that menus planned monthly by each site manager effectively control inventory.

Using a central cycle menu controls inventory by making the items and quantity needed predictable. When the same items served together are repeated, a pattern emerges that, during each cycle, can be used to predict what customers will purchase. This allows managers to improve ordering forecasts. Remember that the menu consists of more than reimbursable meals. A la carte offerings are part of the menu and also should be carefully planned. Timing of menu planning also can affect pricing.

When menus are planned before bids are developed, bid quantities may be forecasted with more certainty. Vendors that can count on accurate bid quantities are more likely to offer volume price discounts. If complete menus cannot be planned in advance, determine the number of times each menu item will be offered during the bid period and later plan menus meeting these guidelines.

A software program can facilitate forecasting by using the sales and production history from previous menu cycles. The number of cycles to review depends on the participation trends of the school. If participation is rising, the history from the last serving date may be all that is needed. If participation is holding steady, review the last two or three menu cycles and forecast using the highest figure.

Procurement

Effective procurement affects inventory control by obtaining the right items in the correct quantity for the best value. Once menus are planned, a list of items to purchase can be developed so that only items planning to be served are purchased. USDA (1998) found that schools carried an average of over 800 SKUs. Reducing the number of SKUs reduces the time it takes to specify, order, receive, track, store, and inventory items.

A SKU is a discrete item with the same characteristic (e.g., juice purchased in five flavors represents five separate SKUs). Each SKU will have its own GTIN. For tracking of items during a recall it is helpful to have fewer SKUs of a certain item when trying to account for the status of all recalled product.

Reviewing menus and recipes to utilize the same SKU for more than one menu item will make inventory control simpler and reduce costs. Also, reviewing production or sales records can identify items with low sales so those items may be eliminated. Selling less than 25 units of an item or flavor of any SKU is probably not worth the time it takes to order, store, and sell it. In large schools the cut off may be 50 sales for a given SKU.

Although food and supply specifications may be written so that more than one product is acceptable to bid, once the purchasing decision has been made only the selected product code should be purchased. When substitutions are needed, an appropriate product code substitution should be approved in advance by someone at the central office and clearly communicated to receiving agents. Product substitutions may lead to a variety of problems including:

- reduced quality,
- non-compliance with regulations,
- increased costs,

- non-compliance with nutritional guidelines, and
- loss of customer satisfaction.

Managing suppliers is also part of inventory management. Clearly identifying vendor requirements in bid documents ensures that your food safety efforts will not be undermined by faulty vendor practices. Adding language to bid documents such as requiring Good Manufacturing Practices (GMP), Good Agriculture Practices (GAP), and Good Handling Practices (GHP) for produce and Farm to School procurement, and requiring HACCP plans and traceability requirements found in SQF2000 or ISO certification can ensure product safety (see Appendix).

Forecasting and Ordering

Forecasting and order can greatly affect inventory control. When forecasting is not accurate and products are ordered in excess:

- too much money is tied up in inventory, which reduces cash flow;
- there is more opportunity for spoilage;
- the incidence of theft is increased;
- more products become obsolete; and
- the quality of products deteriorate overtime.

Problems, such as stockouts and emergency buying, result from under ordering. Both conditions result in not getting maximum value from inventory.

Predictability improves inventory control across the supply chain giving manufacturers the opportunity to lower costs by producing only the quantity of products actually needed by end users and helping distributors stock sufficient quantities of product without overstocking. When schools order larger quantities or different products than vendors expect, items may be out of stock.

Several practices help reduce the out of stock conditions:

- planning cycle menus,
- ordering based on menus,
- sharing menus and expected order quantities with vendors in advance,
- minimizing menu substitutions, and
- maintaining a low inventory of menu items so ordering reflects usage.

An ordering system should be established to prevent over ordering. A par value system establishes a maximum quantity to keep on-hand. The par value is the amount needed to fulfill menu requirements for one ordering period, usually one week, plus a small amount for safety stock. Other factors to consider when setting par values include:

- storage space,
- frequency of deliveries,
- vendor minimum orders, and
- value of product (e.g., higher cost products should be ordered close to the time of use).

Accurately forecasting orders is not a simple task. Managers should not be required to place an order while another order is incomplete. Requiring managers to place weekly orders more than a few of days in advance may result in incorrect ordering.

When orders are placed, the quantity of product to be ordered is the amount needed to bring inventory back to the maximum or par level. If an item is served more than once between delivery periods you must also consider how much will be used before the order is received. Inventory should be checked prior to placing the order and subtracted from the total quantity needed. A par stock method works well for items where consistent amounts are used each week or order period (see Exhibit 4-1). Par values need to be monitored throughout the year and adjusted when menus and participation change.

EXHIBIT 4-1. Determining Order Quantity

PRODUCT/GTIN	FREQUENCY	PAR (MAX)	COMMITTED (+)	INVENTORY (-)	ORDER QTY
# 10012345000017 Peaches 6 cns/cs	Weekly	10 cases	2 cases	1 case	11 cases
# 10012345000021 Trays 10 pkg/cs	Weekly	20 cases	12 cases	12 cases	20 cases
# 10012345456784 Detergent 4 gal/cs	Monthly	2 cases	1 case	1 case	2 cases
# 10123457890006 Chicken Patties 120/cs	Menu	5 cases	0	2 case	3 cases

Ordering based on menus is another alternative. Order guides are designed to match weekly menus. Ordering by menu still requires that you establish the amount you would need to fulfill the menu plus a small extra amount for safety stock. You still consider the amount committed before the order arrives, and the amount currently on inventory. The only difference is the item would not be ordered until right before it is on the menu.

The same ordering system may be used when ordering USDA Foods. The delivery periods may be the same as for commercial products or longer depending on whether or not your state participates in an indirect discount or "net off invoice" program, receives a commercial delivery by a distributor, receives deliveries to a district-operated warehouse, or receives monthly deliveries directly at the school site.

Receiving

The receiving process ensures that you receive specified products that were ordered, in correct quantities, safe, and at the best quality. Receiving is a very important function of inventory control and its value is often overlooked. Effective receiving requires a well-trained employee and the following resources:

- standard operating procedure (SOP) for receiving food and supplies,
- item specifications including product code or GTIN numbers,
- orders and/or receiving documents,
- thermometers for checking temperatures of TCS products,
- markers or date stamp, pens, pencils, wire snips, and clipboard,

- wire cutters for breaking seals on USDA Foods deliveries,
- hand trucks, carts, or dollies to move food to storage areas, and
- scales to weigh products sold by weight.

Deliveries should be scheduled so that the receiving agent has time to check food items thoroughly and store products immediately. Deliveries should not be accepted before trained employees are available to receive them. Deliveries made before school opens or after staff has left for the day must be avoided.

Receiving agents should be familiar with expected deliveries so that the receiving process can move as quickly as possible. There are several steps to the receiving process:

- check that deliveries arrive in a clean truck that is capable of maintaining food at correct temperatures and securing product from tampering during delivery;
- identify the driver if he/she is not familiar to the receiving agent by requesting an ID and recording the driver's name on a receiving log;
- check in products by category examining and storing refrigerated items first, then frozen items, and dry goods last;
- check the product code or GTIN to ensure that the correct product is received and record on the invoice ;
- check each case for quality such as damage to container, wilting or spoilage, and out-of-date products and obtain a credit receipt for rejected products,
- weigh items sold by weight;
- count and check all cases against orders or receiving reports;
- compare invoices to orders, check prices and extensions, note changes, and obtain credit memos;
- check items that were substituted against approved substitution list; and
- stamp or mark all products with a receiving date.

Using software for ordering and receiving helps ensure the correct product is received at the right price. Once products are entered into the software database, only products identified for each site may be ordered. Orders are automatically converted to receiving screens once orders are approved, allowing receipt of only the desired products.

Storage and Issuing

Secure, efficient, and safe storage are key elements of inventory control. This begins with well designed, equipped, and secured storage areas, proper placement of food and supplies, and employees trained in proper storage and issuing processes.

Security is critical to protect foods from theft and intentional contamination or bioterrorism. Since the terrorist actions of 9/11/2001, threats to the security of food have been re-examined. Purposeful contamination of our food and water supply has been identified as potential soft-targets requiring special means of protection. Security of food items should include:

- keep all storage areas and outside access doors locked at all times,
- control keys, establish a policy for securing keys in a locked safe or cabinet, and sign keys in and out to those who do not need routine access,

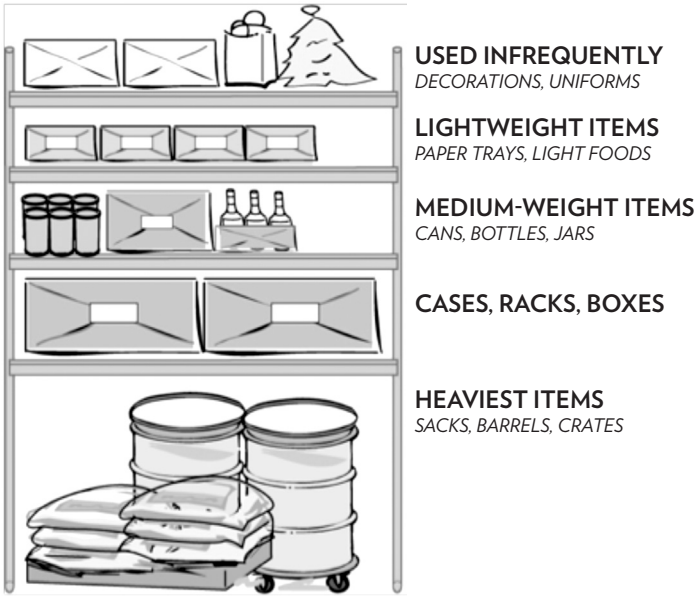
- issue keys only to those employees who need access,
- collect keys immediately from employees who have been fired or resign,
- restrict kitchen access to school nutrition personnel,
- enforce policies requiring visitors to check in at school offices, and
- provide lockers for employees to store bags, purses, and other personal items.

Install security cameras by access doors to the establishment and to all storage areas. Post signs to warn employees and visitors that premises are monitored. Keyless entry systems, otherwise known as key cards, eliminate the need for keys, can be reprogrammed when personnel change, and can leave an audit trail of who has gained access to storage areas.

Efficient storage layout can save time and maintain safety and security. Because National School Lunch regulations permit a single inventory method, USDA Foods and commercial foods do not need to be stored separately. Here are some tips for designing storage areas (see Exhibit 4-2):

- use mobile shelving with adjustable shelf heights, dunnage racks, and dollies rather than stationary shelving,
- place high use products near the door for easy access,
- keep products in original cases, unless pest infestation is a problem, so that information needed for traceability remains intact,
- place products in storage areas in the order of inventory forms or a "sheet to shelf" numbering system to label shelving and assign products to specific locations then print inventory worksheets using the same order,
- place foods that will receive no further cooking on shelves above raw foods that will be cooked, with lowest safe cooking temperatures placed above items requiring higher cooking temperatures,
- store chemicals away from food and paper supplies, in a separate locked section of storage area away from food to protect food and supplies from contamination,
- store the heaviest containers near entry on lower shelves, dollies, or dunnage racks to reduce the chance of injuries when moving product, and
- place expensive products in locked racks or away from easy access to exits.

EXHIBIT 4-2 Example of proper placement of items in storage



Removing or issuing stock is another point where controls are needed. Allowing several different employees to remove products from storage areas decreases efficiency and increases potential for theft. Practice first-in, first out stock rotation and train employees to check "use-by date" or delivery date to ensure older products are used first.

Storeroom requisitions for issuing products should be used along with production records to provide an audit trail for items used (see Exhibit 4-3). Keeping records of food in storage is a critical tracking event. The specific product code number or GTIN should be listed on the requisition along with the initials of the person(s) who removed the stock. For improved traceability, lot numbers also should be listed. Food and supplies that are delivered directly to production or serving areas rather than storage areas, such as milk and produce, must also be recorded on a requisition. Requisitions also can be used for completing production records. Different approaches can be considered for issuing stock.

All employees should review the menu and recipes a day in advance and provide a written list of items needed or a requisition. An employee trained in issuing gathers supplies, places them on trucks or carts, checks items off the list, and delivers to each work area. This method requires sufficient refrigerated storage in production areas to keep foods at proper temperature during production. If cold storage is not available, multiple requisitions with the addition of delivery time may be needed to accommodate batch cooking methods.

Ingredient rooms increase control of inventory by assigning to a person(s) tasks related to pulling inventory as well as weighing and measuring all ingredients needed for the day's production. Ingredient rooms are effective in high volume kitchens and centralized production facilities where centralizing equipment needed to weigh and measure food can save time and improve accuracy.

When there is a small staff or insufficient cold storage in work areas, production employees obtain products from storage areas, write down products removed, and sign a storeroom requisition. This system requires that all employees receive training in stock rotation, safe lifting, and recordkeeping.

EXHIBIT 4-3 Sample Storeroom Requisition

Storeroom Requisition Number: 129

Date: 05/06/2010

Storeroom: Dry Storage

Qty	Unit	Product Code	Lot #	Description	Issued to	Unit Price	Total Price
1	Can	12345	3029	Tomato Paste	JB	$ 2.00	$ 2.00
2	Cases	23456	9909, 9908	Peaches, Canned	BG	$ 12.00	$ 24.00
4	Bags	34567	2000811	Macaroni	JN	$ 1.20	$ 4.80
Total							**$30.80**

Inventory Control Records

Food and supplies account for 40% or more of program revenues and warrant the time it takes to keep adequate and accurate records of products. In order to have a complete picture or audit trail of products received and used, a good recordkeeping system needs to include menus, orders, receiving records, requisitions, production records, and point-of-sale or serving records. Each type of record has a specific purpose; however, collectively they lay the groundwork for internal traceability for each food item.

Perpetual Inventory

A record of food and supplies received, issued, and a running balance on hand is called a perpetual inventory. Some states require schools to maintain perpetual inventory records. A manual perpetual inventory is time consuming and, unless required by the state agency, for small operations may not be cost effective. A perpetual inventory can:

- provide information about current stock levels,
- serve as a tool for ordering,
- provide information for food and supply cost control,
- prevent theft, spoilage, and other shrinkage, and
- improve the ability to trace foods in the event of a recall or foodborne illness.

In perpetual inventory systems, a card or page is kept for every item that is purchased. Cards are updated daily from receiving reports or storeroom requisitions. When a physical inventory is taken, the actual count is recorded on the card and adjustments are recorded for differences found between the "book" or card quantity on hand and actual quantity on hand (see Exhibit 4-4). Having a written record of adjustments provides a tool to track shrinkage due to theft or other discrepancies. Inventories should also be kept for USDA Foods held by distributors or processors.

EXHIBIT 4-4 Perpetual Inventory Card

Product Code: 23456 **Description: Peaches, Canned** **Storeroom: Dry** Storage

Purchase Unit: Case **Issue Unit:** Can

Date	Req/Invoice	Qty In (Purchase Unit)	Qty Out (Issue Unit)	Balance (Issue Unit)
5/10/10	RQ 129		12	2
5/12/10	PO 222	2		14
5/17/10	RQ 140		12	2
5/29/10	INV			1

Computer systems have made maintaining a perpetual inventory system much easier. Usually food is ordered through the software program, which creates a receiving record. When food is received, inventory is updated with new quantities and inventory values are adjusted. When food is issued or used, the inventory quantity is adjusted again. Some systems utilize menu plans and production forecasts in order to compare the planned with the actual quantities used. Finally, a periodic physical inventory is taken and recorded to keep the inventory system accurate and to identify discrepancies.

Physical Inventory

An actual count of food and supplies must be taken on a periodic basis. This is called a physical inventory. In schools, a physical inventory is usually taken of all products in refrigerators, freezers, and dry storage areas once a month.

Note for central kitchens and warehouses: In larger volume operations it is not usually practical to take a full monthly inventory at one time. These operations should maintain a perpetual inventory system and utilize cycle counts for checking accuracy of inventory records and to control shrinkage. In cycle counting, a group of products is randomly selected from a list of expensive or high volume products and counted on a periodic basis. For example, 20 different items may be counted each week.

It is a best practice to have two people involved in taking inventory; one to count and one to record. To maintain integrity, at least one of the people should not be involved with day-to-day storekeeping responsibilities such as receiving or issuing.

Food and Supply Cost Calculation

Food and supply cost may be calculated in two ways. One way is to calculate the total food and supplies used from daily storeroom requisitions. This may be useful when a monthly inventory system is not used. An advantage of this system is that it will provide an actual food cost associated with the day's menu. This value may be added to production records for post-costing of menus so that you can see what part of food cost can be attributed to waste.

Inventory values may be used to calculate food costs when used with food purchases. When inventory values are used to calculate food cost, timing of monthly physical inventories should coordinate with invoice processing so that items included in the ending inventory also are included in food and supplies purchased for the month. The same formula may be used for calculating food or supplies. The formula for calculating food cost is:

Beginning inventory + food purchases - ending inventory = cost of food used

This method provides an accurate monthly cost but will not provide enough information to determine the days that food costs are too high or what portion of the food cost can be attributed to waste or shrinkage. Post costing of menus will help determine if high food costs can be attributed to incorrect forecasting or waste.

Technology can greatly benefit the process of taking a physical inventory. The simplest systems provide items listed in the order of storage areas, record quantities on hand, track unit pricing, and calculate total inventory value. More sophisticated systems allow the user to scan in bar codes for items and type in quantities. Both will lead to faster and more accurate inventory counting than traditional methods.

Production

Production procedures impact inventory control by ensuring correct products are used, portion sizes are correct, and waste from production is controlled. If using cycle menus, production records can be pre-printed with:

- product codes/GTIN,
- recipe numbers,
- serving size, and
- serving utensil required.

This ensures the right items and portions are used in production. Record the GTIN or product code of foods used in production  . To help with traceability, lot numbers may be added to production records as products are pulled from inventory.

All recipes should be standardized for consistent yields. Recipes should be extended to the number of servings needed. Match recipe extensions to standard serving pan sizes to discourage overproduction. In some cases, this may mean purchasing smaller pans such as half pans for lasagna or half sheet pans for pizza. Using standard or whole production measures on production records and recipe extensions helps control waste by planning the use of whole cans rather than specifying a partial can only to have production employees use the entire contents rather than saving the remainder as a leftover.

Waste may be controlled by accurately forecasting production needs and batch cooking. Production records are not just a program requirement; they are also an important management tool. Cycle menus make it easier to forecast needs. For efficient use of cycle menus:

- predict the quantity of each item needed using sales and production history,
- plan to have a small amount of each item leftover to ensure all students have the same choices,
- record the number of servings sold at the end of each serving period or every 30 minutes to forecast batch cooking needs for the next menu cycle,
- record an estimate of how many additional servings may have been sold when products run out, in order to forecast more accurately for the next menu cycle,
- complete production records immediately after each serving period to promote accuracy,
- freeze usable leftovers to serve the next time the cycle is repeated, and
- record production projections and leftovers to be used on the production record for the next menu cycle immediately after completing each day's production record.

Having enough stock on hand for production is essential. When products are substituted due to insufficient stock, historical records cannot be used to forecast production and current records will not be useful for forecasting future production. This often begins a cycle of inaccurate forecasting that is difficult to break.

Service

The final process affecting inventory is serving products to customers. Sometimes the best production planning is ineffective due to serving incorrect portion sizes. Correct portioning can:

- result in customer satisfaction because the same portion size is served to everyone,
- make certain that expected yields are obtained from recipes so that products do not run out,
- ensure that school nutrition program regulations for serving sizes are met, and
- control costs.

Controlling theft during service is also important in inventory management. Food items that are easy to hide in pockets or bags need to be placed by the cashier or held behind the line until customers have paid for them.

Keeping an inventory of items placed on the line can help identify when theft is occurring. This is effective for tracking a la carte items that tend to be stolen more frequently. One employee should place items in snack bars or serving lines

and record the count for each item (see Exhibit 4-6). As lines are refreshed with items, the record should be updated. A different employee should cashier the line. Once serving is over, the employee should take a final count of the items and record. The site manager adds the sales from the point-of-sale report or tape. The usage is calculated:

beginning inventory + additions – ending inventory = sales

Specific items can be programmed on the computerized cash register at the point-of-sale rather than using generic item keys. This improves item tracking, aids in completing production records, and helps identify theft. Requirements to record servings of a la carte and adult portions on production records are nearly impossible to achieve accurately without ringing up individual food items at the point-of-sale.

Some point-of-sale systems allow users to scan bar codes at the point-of-sale. Many prepackaged item labels are already printed with bar codes. This practice records specific item information quickly and accurately. Compare the point-of-sale register sales record to the projected sales. If there is a sizable difference between the two amounts, either the cashier is not ringing up sales correctly or customers are taking items and not paying for them.

EXHIBIT 4-6 Sales Inventory Form

Item	Beg. Inventory	+ Additions	- End Inventory	= Number Sold	Price	Projected Total
Water	48	24	20	52	.75	$ 39.00
Juice, 12 oz	60		10	50	1.00	$ 50.00
Pretzels	48	12	5	55	.50	$ 27.50
Crackers	24		4	20	.50	$ 10.00
Expected Total Sales						$126.50
Total Sales from Register						$120.50

Adding columns for portion cost information to production records enables the manager to identity where food costs are affected by overproduction and waste. Exhibit 4 -7 illustrates this process:

1. Multiply portion cost (column 4) by usage (columns 7 and 8) to achieve total cost (column 9).
2. Divide total cost (column 9) by number served (column 7) to achieve actual portion cost (column 10).
3. Total column 9 to get the total food cost for the meal.
4. Divide the total food cost (11) by number of meals served (2). This is the cost per lunch (13).
5. Notice that the $ .86 actual cost (13) is $ .05 per meal higher than the planned cost (1) of $ .81. This was due to the waste from the sandwiches and broccoli.

EXHIBIT 4 -7 Example of Post Service Section of Production Record

Planned per meal cost: $ .81 **(1)** Lunches served: 85 **(2)**

Menu Item (3)	Portion Cost (4)	Qty Produced (5)	Usable Leftover (6)	Served (7)	Waste (8)	Total Cost (9)	Actual Portion Cost (10)
Chicken Patty on Bun	$ .35	100	10	85	5	$ 31.50	$ .37
Broccoli	$ .20	75	0	65	10	$ 15.00	$ .23
Peaches	$ .18	80	10	70	0	$ 12.60	$ .18
Milk	$ .20	85	15	70	0	$ 14.00	$ .20
Total Meal Cost (11)						$ 73.10	
Actual Food Cost Per Meal $ .86 = $ 73.10 ÷ 85 **(13)**							

Technology can make preparation of production records much faster and more accurate. A simple spreadsheet can be developed for each day and designed with locked cells with menu items, portion sizes, portion costs, and formulas for all calculations. The cooks and managers enter the quantities produced, served, and wasted and spreadsheet formulas complete the calculations. Computer software can make the process even more precise by calculating pre-costs from recipes and menus and adding items served from point-of-sale transactions.

Summary

Inventory control is more than securing products in storage areas. It starts with carefully planned menus, procuring the right products in the right quantities, and making sure the items ordered are the ones received. Secure storage areas are important; however accurate production forecasting and meal preparation to ensure student choices are equally important. Finally, serving the planned portion of each food item and protecting items from customer and employee theft completes the chain of control.

CHAPTER 5

Responding to Food Emergencies including Recalls

Preparing for Problems

Careful management of food and supply inventories from the time a product is received into the facility until it is served or discarded is considered good business practice. These management practices include:

- keeping products secure,
- separating products from sources of contamination, and
- tracking quantities received, on-hand, used, and disposed.

Proactive preparation for emergencies has increased the need for additional inventory management practices that will prevent or minimize foodborne illness caused by products that have been adulterated, mishandled, or mislabeled. Schools may either be a recipient of products suspected of contamination or they could be the source of contamination. In both instances, careful inventory practices and recordkeeping can minimize damages.

Every school district should develop an Emergency Management Plan that provides:

- descriptions of emergencies that might affect the school district;
- contact information for emergency-management team members, district administration, and outside resources such as the health department, the fire department, the local Environmental Protection Agency, and the local Environmental Health Agency;
- roles and responsibilities of each emergency-management team member;
- appropriate response to each type of emergency;
- communication plan containing information to be shared with employees, parents, and community and who the spokesperson will be; and
- a recovery plan for each type of emergency including follow-up investigations.

Ensuring the ability to trace foods back through the supply chain to their original source and to track food received from your facility is part of a proactive emergency response plan and is needed in the event that:

- school customers become ill from eating a food product served at school;
- a food safety or quality problem for a product is identified at your facility; or
- a product is recalled.

This requires keeping records containing information used to identify the product, the source or recipient, and delivery (Exhibit 5-1).

EXHIBIT 5-1 Recordkeeping Requirements for Tracking Food and Supplies

RECORD	SPECIFIC INFORMATION
Product identification information	Manufacturer Product code or GTIN Lot or batch number Sell by or use by date Establishment number for meat, poultry, or egg products
Information about the source or recipient (if shipping to another location)	Name GLN Physical address Phone number Fax number E-mail address
Delivery or shipping information	Delivery order number Notice to deliver number Delivery date Quantity of product received or shipped

When a problem occurs at a school, a detailed description of the problem and contact information for the people involved (e.g., customer reporting illness, personnel who prepared the food) should be kept. Food should not be discarded until a sample is taken by the Health Department or instructed by state agency during a recall process. Disposal of products is a CTE  . A written record of all food discarded and the manner in which it was disposed of should be maintained.

Freeze one or two servings of every batch of prepared food that has been cooled and reheated to use in the event of a complaint. Label the product with recipe number and/or name, date of preparation, name of personnel who prepared the item, date the item was served, and the date when the sample may be discarded. Note the products and product number that were sampled and stored on production records. Keep for two weeks.

> Central Production Facilities: Setup a schedule to randomly sample product on the production line and send to a laboratory for microbial analysis. Record the product name, date of production, date of service, personnel involved in production, and outcome of the analysis. Note the products that were sampled and stored on production records.

Identifying Stakeholders and Their Responsibilities

It takes a team to respond to emergencies and many different school personnel may be involved, each fulfilling distinct roles. Some emergencies require roles that are not needed in other circumstances (Exhibit 5-2). The size and composition of the emergency response team will depend on the size of the district and the nature and scope of the emergency. In addition to internal personnel, individuals representing outside agencies may play a role including the health department, emergency first responders, and state agencies.

EXHIBIT 5-2 Internal Roles Required for Various Emergencies

ROLE AND RESPONSIBILITY	BIOTERRORISM	FOODBORNE ILLNESS	NATURAL DISASTER	RECALL
Local School District				
Emergency Director – Responsible for response, coordinates team activities, and serves as single point of contact for outside agencies.	X	X	X	X
Communication Coordinator – Media and community spokesperson, drafts press releases, posts notices to website, and conducts media briefings.	X	X	X	X
Logistics Coordinator – Responsible for securing facility, providing accommodations and transportation for response team, providing communication e.g., phone, walkie-talkies	X		X	
Human Resources Coordinator – Next of kin notification, counseling services, hiring of temporary help needed for crisis	X	X	X	
Supply Chain Coordinator – Determines impact on products being shipped from facility, current stock, and products due in.	X	X	X	X
Product Disposal Coordinator - Destroy and/or dispose of products in a manner that will not harm people or the environment.	X	X	X	X
Local Authorities				
Police Department	X			
Fire Department	X			
Local Health Department	X	X		X
Local Environmental Protection Agency	X			X
Local Environmental Health Association	X	X		
State Authorities				
State Health Department		X		
State Department of Agriculture	X			
State Agency responsible for USDA Foods program	X	X		X
State Environmental Protection Agency	X			
State Environmental Health Agency	X	X		

ROLE AND RESPONSIBILITY	BIOTERRORISM	FOODBORNE ILLNESS	NATURAL DISASTER	RECALL
Federal Authorities				
USDA, FSIS (Meat, Poultry, Eggs, and USDA Foods)	X	X	X	X
USDA, FNS	X	X	X	X
Department of Health and Human Services (HHS)	X	X		X
Food and Drug Association (FDA)				X
Centers for Disease Control and Prevention (CDC)	X	X		
Food Emergency Response Network (FERN)	X	X	X	
Federal Bureau of Investigation (FBI)	X			
Department of Homeland Security (DHS)	X		X	
Emergency Preparedness and Response (EP&R)				
Federal Emergency Management Agency (FEMA)				
Private Sector				
Manufacturers and further processors	X	X		X
Distributors	X			X
Private cold and dry warehouses	X		X	X

At a minimum, the director will be expected to provide information about the products served, when they were served, the people who had access to the implicated food products, who received or was served the products, and how much was consumed. The accuracy and completeness of records will be crucial in determining the products involved and the ability to control damage. The director of school nutrition also may be assigned the role of supply chain coordinator and product disposal coordinator or given other roles depending on the circumstances.

Commercial Products

School districts are responsible for ensuring the safety of commercial food items. USDA Foodand Nutrition Service and state agencies do not know what foods school districts may purchase and cannot ensure product safety or inform schools regarding commercial product recalls. When a commercial product is recalled that may be used in schools, USDA and the state agency may send a general alert. Although most vendors will alert their customers of recalled products, district personnel should track recalls by signing up for recall e-mail alerts on www.recalls.gov, which tracks recalls for both FDA and FSIS. Districts also may sign up on GovDirect for notices from FNS about USDA Foods. Links to both sites are included in the Resources section of this guide.

To report a problem with a food purchased commercially, contact the manufacturer directly. Information should include:

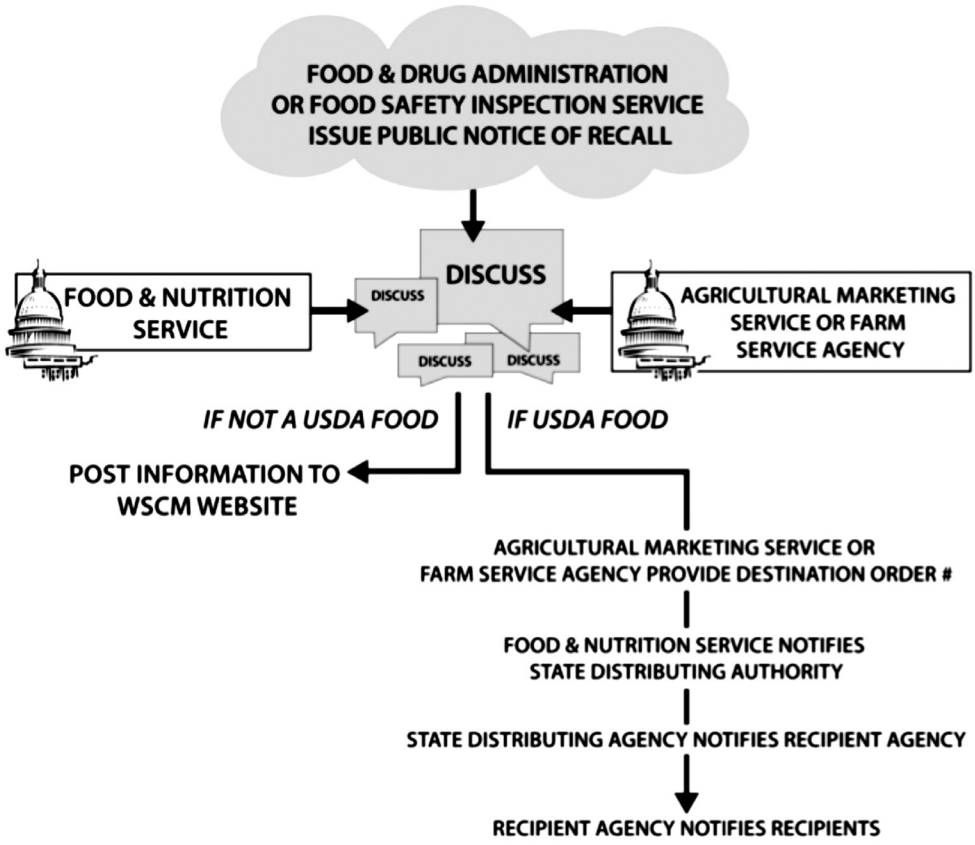
- product name and code (GTIN) number,
- lot, batch, and/or manufacturing or use-by date,
- clear statement of the problem,
- quantity of product affected and still on hand, and
- name and GLN of distributor and delivery date.

If a commercial food is suspected as the cause of a foodborne illness in schools, the local health department should be contacted first so they can assist in identifying the source of the illness. A written record should be kept of the complaint. At no time should school nutrition personnel admit guilt before an investigation is complete.

USDA Foods (Brown Box and Processed)

In the case of USDA Foods, the school district, state distributing agency (SDA), and FNS all have responsibilities for food safety (Exhibit 5-3). FNS is responsible for alerting state distributing agencies of any USDA Foods that are recalled. For foods diverted to a processor, notifications will come from the state agency and the processor. State distributing agencies are responsible for alerting all recipient agencies, including school districts. FNS cannot directly notify school districts because they do not know who has received product; however, schools may sign up for the Commodity Alert System at https://www.envoyprofiles.com/USDA-ALERTS/ . Once the registration form is completed, a confirmation email will be sent that explains how to activate your account. Be sure to follow directions in the follow-up email to complete the registration process.

EXHIBIT 5-3 Agencies Involved With Recalls of USDA Foods



When a problem occurs with a USDA Foods or a further-processed food product, it should be reported to the state distributing agency, not FNS. The SDA will determine if the problem can be resolved at the local or state level, and if not, the SDA will report the problem to FNS. A record should be kept of the complaint. School districts should be prepared to provide the following information to the SDA:

- USDA Foods name and code number;
- case codes including lot, batch, or manufacturing or use-by date;
- description of the problem with special circumstances involved;
- date USDA Foods was received;
- quantity of product affected;
- quantity and physical address of product remaining and if the remaining product is affected or not;
- contract number (may be stenciled on the outer carton);
- delivery order number and notice to deliver number;
- digital photographs of damaged product or foreign objects, if helpful; and
- payee information and documentation of loss if requesting reimbursement.

CHAPTER 6

Standard Operating Procedures

Schools must comply with federal, state, and local regulations covering school nutrition programs, public health, purchasing, and accounting practices as well as policies related to foodservice and business best practices. Standard operating procedures (SOPs) clarify and simplify regulations and policies into a format that employees can use in their work environment. Development of SOPs can:

- improve processes;
- improve compliance with regulations and policies;
- clarify and improve staff performance;
- identify roles and responsibilities;
- provide base content for training programs; and
- provide instructions for immediate corrective actions if necessary.

The concept of inventory management and tracking may be new to school nutrition staff. Creating new SOPs and updating existing SOPs to address inventory management and tracking ensures school nutrition employees across the district consistently handle inventory in a manner that controls cost, improves productivity, and provides safe products with consistent quality.

The SOPs in this chapter are intended to serve as examples. Each school nutrition operation must establish their own SOPs to address their specific products, personnel, equipment, processes, and needs.

Tracking Products

(Sample SOP)

PURPOSE: To ensure that all food and supplies can be identified and accounted for from the moment they are received until they are consumed, disposed of, or shipped to a new location.

SCOPE: This procedure applies to employees who handle, prepare, or serve food.

KEY WORDS: Receiving, Storage, Production, Holding, Serving, Delivery, Tracking, Traceability

INSTRUCTIONS:

1. Follow State or local health department requirements.
2. Compare delivery invoice against products ordered and products delivered for both delivery quantities and product code or GTIN.
3. Record GTIN, lot number, and storage location in perpetual inventory system (manual or electronic) upon receipt of product, when product is removed from storage, or when a product is disposed of.
4. Store products in labeled storage area. When products are removed from storage area, record GTINs and lot numbers on storage requisition form. Use the storeroom requisition to update perpetual inventory system.
5. Record GTINs on production records. If a leftover product is used, include the date the product was originally prepared on the production record.
6. If products are shipped to another location record the GTINs and lot numbers on the shipping record.
7. If a product is disposed of, record the GTIN and lot on a Damaged or Discarded Product Log. Use this log to update the perpetual inventory system.

THE UNIT SUPERVISOR WILL:

1. Train employees on using the procedures in this SOP.
2. Post SOP in storage area.

MONITORING:

The manager will observe products received, removed from storage, and produced. The manager will also observe products shipped each day to ensure that product numbers or GTINs and lot numbers are recorded.

CORRECTIVE ACTION:

1. Retrain any employee found not following the procedures in this SOP.
2. Remind employees where SOP's are located.

(Sample SOP)

VERIFICATION AND RECORD KEEPING:

The manager will complete the Site Inventory Management and Tracking Checklist monthly. The Site Inventory Management and Tracking Checklist will be kept for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

Receiving Deliveries

(Sample SOP)

PURPOSE: To ensure that all food is received fresh and safe when it enters the school nutrition operation, to facilitate traceability, and to transfer food to proper storage as quickly as possible.

SCOPE: This procedure applies to employees who handle, prepare, or serve food.

KEY WORDS: Cross-Contamination, Temperatures, Receiving, Holding, Frozen Goods, Delivery, Tracking, Traceability

INSTRUCTIONS:

1. Follow State or local health department requirements.
2. Organize freezer and refrigeration space, loading docks, and store rooms before deliveries.
3. Gather product specification lists and purchase orders, temperature logs, calibrated thermometers, pens, flashlights, and clean carts before unloading deliveries. Refer to the Using and Calibrating Thermometers SOP.
4. Keep receiving area clean and well lighted.
5. For USDA Foods deliveries, clip seal on truck.
6. Do not touch ready-to-eat foods with bare hands.
7. Mark products with the date of arrival or the "use-by" date accordingly upon receipt. 
8. Compare delivery invoice with products ordered and products delivered for both delivery quantities and product code or GTIN.
9. Record lot numbers on perpetual inventory cards, invoices, or other receiving records. 
10. Transfer foods to their appropriate locations as quickly as possible.

THE UNIT SUPERVISOR WILL:

1. Train employees on using the procedures in this SOP.
2. Schedule deliveries to arrive at designated times when employees are available to check them in.
3. Post the delivery schedule, including the names of vendors, days and times of deliveries, and drivers' names.

THE DIRECTOR OF SCHOOL NUTRITION WILL:

1. Establish a rejection policy to ensure accurate, timely, consistent, and effective refusal and return of rejected goods.
2. Determine whether foods will be marked with the date of arrival or the "use-by" date.

(Sample SOP)

MONITORING:

1. the delivery truck periodically when it arrives to ensure that it is clean, free of putrid odors, and organized to prevent cross-contamination. Be sure refrigerated foods are delivered on a refrigerated truck.
2. Check the interior temperature of refrigerated trucks.
3. Confirm vendor name, day and time of delivery, and driver's identification before accepting delivery. If driver's name is different from what is indicated on the delivery schedule, contact the vendor immediately.
4. For USDA Foods delivery, check the seal on truck. If the seal is broken, contact the state distributing agency.
5. Check frozen foods to ensure that they are all frozen solid and show no signs of thawing and refreezing, such as the presence of large ice crystals or liquids on the bottom of cartons.
6. Check the temperature of refrigerated foods.
   a. For fresh meat, fish, and poultry products, insert a clean and sanitized thermometer into the center of the product to ensure a temperature of 41°F or below. The temperature of milk should be 45°F or below.
   b. For packaged products, insert a food thermometer between two packages being careful not to puncture the wrapper. If the temperature exceeds 41°F, it may be necessary to take the internal temperature before accepting the product.
   c. For eggs, the interior temperature of the truck should be 45°F or below.
7. Check dates of milk, eggs, and other perishable goods to ensure safety and quality.
8. Check the integrity of food packaging.
9. Check the cleanliness of crates and other shipping containers before accepting products. Reject foods that are shipped in dirty crates.

CORRECTIVE ACTION:

1. Retrain any employee found not following the procedures in this SOP.
2. Reject the following:
   - Frozen foods with signs of previous thawing
   - Cans that have signs of deterioration, such as swollen sides or ends, flawed seals or seams, dents, or rust
   - Punctured packages
   - Foods with out-dated expiration dates
   - Foods that are outside the safe temperature zone or deemed unacceptable by the established rejection policy
   - Items with product codes or GTINs that do not match products ordered

(Sample SOP)

VERIFICATION AND RECORD KEEPING:

Record the food temperature and corrective action on the delivery invoice or on the Receiving Log. The manager will verify that employees are receiving products using the proper procedure by visually monitoring receiving practices during the shift and reviewing the Receiving Log at the close of each day. Receiving Logs are kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

Adapted from the U.S. Department of Agriculture, Food and Nutrition Service, and the National Food Service Management Institute. (2005). *HACCP-based standard operating procedures (SOPs)* designed to address food safety issues.

Transporting Food to Remote or Satellite Sites (Shipping Site)

(Sample SOP)

PURPOSE: To prevent foodborne illness by ensuring that food temperatures are maintained during transportation; contamination is prevented; and aid product traceability by recording product codes and lot numbers.

SCOPE: This procedure applies to employees who transport food from a central kitchen to remote sites (satellite kitchens).

KEY WORDS: Hot Holding, Cold Holding, Reheating, Cooling, Transporting Food, Tracking, Traceability

INSTRUCTIONS:

1. Follow State or local health department requirements.
2. If State or local health department requirements are based on the *2009 FDA Food Code*:
   - Keep frozen foods frozen during transportation.
   - Maintain the temperature of refrigerated, potentially hazardous foods at 41°F or below and cooked foods that are transported hot at 135°F or above.
3. Use only food carriers for transporting food approved by the NSF or that have otherwise been approved by the state or local health department.
4. Prepare the food carrier before use:
   - Ensure that all surfaces of the food carrier are clean.
   - Wash, rinse, and sanitize the interior surfaces.
   - Ensure that the food carrier is designed to maintain cold food temperatures at 41°F or below and hot food temperatures at 135°F or above.
   - Place a calibrated stemmed thermometer or temperature data logger in the warmest part of the carrier if used for transporting cold food, or the coolest part of the carrier if used for transporting hot food. Refer to the Using and Calibrating Thermometers SOP.
   - Pre-heat or pre-chill the food carrier according to the manufacturer's recommendations.
5. Store food in containers suitable for transportation. Containers should be:
   - Rigid and sectioned so that foods do not mix.
   - Tightly closed to retain the proper food temperature.
   - Nonporous to avoid leakage.
   - Easy-to-clean or disposable.
   - Approved for food use and have National Sanitation Foundation emblem.

Transporting Food to Remote Sites (Satellite Kitchens), continued

(Sample SOP)

INSTRUCTIONS, continued:

6. Place food containers in food carriers and transport the food in clean trucks, if applicable, to remote sites as quickly as possible.
7. Prepare shipping documents to include: date, product code, quantity shipped, and lot or batch number.
8. Follow Receiving Deliveries SOP when food arrives at remote site.

THE UNIT SUPERVISOR WILL:

Train employees on using the procedures in this SOP.

MONITORING:

1. Check the air temperature of the food carrier to ensure that the temperature suggested by the manufacturer is reached prior to placing food into it.
2. Check the internal temperatures of food using a calibrated thermometer before placing it into the food carrier. Refer to the Holding Hot and Cold Potentially Hazardous Foods SOP for the proper procedures to follow when taking holding temperatures.

CORRECTIVE ACTION:

1. Retrain any employee found not following the procedures in this SOP.
2. Continue heating or chilling food carrier if the proper air temperature is not reached.
3. Reheat food to 165°F for 15 seconds if the internal temperature of hot food is less than 135°F. Refer to the Reheating Potentially Hazardous Foods SOP.
4. Cool food to 41°F or below using a proper cooling procedure if the internal temperature of cold food is greater than 41°F. Refer to the Cooling Potentially Hazardous Foods SOP for the proper procedures to follow when cooling food.
5. Discard food held in the temperature danger zone (41° F to 135° F) for greater than 4 hours.

VERIFICATION AND RECORD KEEPING:

1. Before transporting food to remote sites, school nutrition employees will record food carrier temperature, food product name and product code, time, internal temperatures, and any corrective action taken on the Hot and Cold Holding Temperature Log.

(Sample SOP)

2. The manager at central kitchens will verify that school nutrition employees are following this SOP by visually observing employees and reviewing and initialing the Hot and Cold Holding Temperature Log and shipping document daily.

3. The manager will complete the Food Safety Checklist daily. The Food Safety Checklist is to be kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

Adapted from the U.S. Department of Agriculture, Food and Nutrition Service, and the National Food Service Management Institute. (2005). *HACCP-based standard operating procedures (SOPs)* designed to address food safety issues.

Receiving Food Shipped from Production Kitchen

(Sample SOP)

PURPOSE: To prevent foodborne illness by ensuring that food temperatures are maintained during transportation; contamination is prevented; and product can be traced by recording product codes and lot numbers.

SCOPE: This procedure applies to satellite kitchen employees who receive food from a central kitchen.

KEY WORDS: Hot Holding, Cold Holding, Reheating, Cooling, Transporting Food, Tracking, Traceability

INSTRUCTIONS:

1. Follow State or local health department requirements.
2. If State or local health department requirements are based on the *2009 FDA Food Code*:
   - Check and record product code or GTIN, receiving temperatures, and corrective actions taken on the Receiving Log upon receipt of food. Sign the shipping document and return it to the central kitchen.
   - Maintain the temperature of refrigerated, potentially hazardous foods at 41°F or below and cooked foods that are transported hot at 135°F or above.

THE UNIT SUPERVISOR WILL:

Train employees on using the procedures in this SOP.

MONITORING:

Check the internal temperatures of food using a calibrated thermometer when receiving it. Refer to the Holding Hot and Cold Potentially Hazardous Foods SOP for the proper procedures to follow when taking holding temperatures.

CORRECTIVE ACTION:

1. Retrain any employee found not following the procedures in this SOP.
2. Reheat food to 165°F for 15 seconds if the internal temperature of hot food is less than 135°F. Refer to the Reheating Potentially Hazardous Foods SOP. Reject food if it is less than 135°F and equipment is not available to reheat food.
3. Cool food to 41°F or below using a proper cooling procedure if the internal temperature of cold food is greater than 41°F. Refer to the Cooling Potentially Hazardous Foods SOP for the proper procedures to follow when cooling food.
4. Discard food held in the temperature danger zone for greater than 4 hours.

(Sample SOP)

VERIFICATION AND RECORD KEEPING:

1. The manager at the remote site(s) will verify that employees are receiving foods at the proper temperature and following the proper receiving procedures by visually observing receiving practices during the shift and reviewing and initialing the Receiving Log daily. All logs are kept on file for a minimum of 1 year.
2. The manager will complete the Food Safety Checklist daily. The Food Safety Checklist is to be kept on file for a minimum of 1 year.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

Adapted from the U.S. Department of Agriculture, Food and Nutrition Service, and the National Food Service Management Institute. (2005). *HACCP-based standard operating procedures (SOPs)* designed to address food safety issues.

Handling a Food Recall – District Office

(Sample SOP)

PURPOSE: To prevent foodborne illness by quickly identifying and securing products in the event of a product recall.

SCOPE: This procedure applies to district-level personnel responsible for reporting recall information.

KEY WORDS: Food Recalls, Traceability, Tracking

INSTRUCTIONS:

1. Follow State or local health department requirements.
2. Review the food recall notice and specific instructions that have been identified in the notice.
3. Check purchasing specifications and receiving documents to identify products matching the product code or GTIN and lot numbers identified in recall notice.
4. Communicate the food recall notice to affected feeding sites using a method that confirms the message was received and understood e.g., e-mail with read receipt.
5. Prepare instructions for the site personnel to hold the recalled product using the following steps:
   - Physically segregate the product, including any open containers, leftover product, and food items in current production that contain the recalled product.
   - If an item is suspected to contain the recalled product, but label information is not available, segregate with other foods containing recalled product.
   - Mark recalled product "Do Not Use" and "Do Not Discard." Inform the entire staff not to use the product.
6. Arrange for food to be collected and disposed of as soon as possible or within 30 days per instructions contained in the recall notice.
7. Do not destroy any USDA Foods without official written notification from the State Distributing Agency, USDA Foods Safety Inspection Services (FSIS), or State or local health department.
8. Inform the school district's public relations coordinator of the recalled product and what steps are being taken to secure and dispose of the product.
9. Obtain accurate counts of the recalled products from every feeding site, including the amount received, in inventory, and amount used.
10. Account for all recalled product by verifying site inventory counts against records of food received at the feeding site.
11. Identify and record in a spreadsheet whether any of the product was received in the district, the status of the product (e.g., used, on-hand), locate the food recall product by feeding site, and verify that the food items bear the product identification code(s) and lot and/or production date(s) listed in the recall notice.
12. Report the status of recalled product within 10 days to State distributing agency (for USDA Foods) or manufacturer (for purchased and further processed food).

(Sample SOP)

THE UNIT SUPERVISOR WILL:

Train employees on using the procedures in this SOP.

MONITORING:

Employees and manager will visually observe that school sites have segregated and secured all recalled products.

CORRECTIVE ACTION:

Retrain any employee found not following the procedures in this SOP.

VERIFICATION AND RECORD KEEPING

1. Employees will record the name and product code or GTIN, lot number of the contaminated food, date, time, and the reason why the food was discarded on the Damaged or Discarded Product Log.
2. The manager will verify that appropriate corrective actions are being taken by reviewing, initialing, and dating the Damaged or Discarded Product Log each day. Maintain the Damaged or Discarded Product Logs for a minimum of 1 year.
3. The school nutrition director will complete and maintain all required documentation related to the recall including:
   - Recall notice
   - Records of how food product was returned or destroyed
   - Reimbursable costs
   - Public notice and media communications
   - Correspondence to and from the public health department and State agency

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

Adapted from: National Food Service Management Institute. (2002). *Responding to a Food Recall.* University, MS: Author.

Handling a Food Recall – School Site

(Sample SOP)

PURPOSE: To prevent foodborne illness by quickly identifying and securing products in the event of a product recall.

SCOPE: This procedure applies to site school nutrition employees who prepare or serve food.

KEY WORDS: Food Recalls, Traceability, Tracking

INSTRUCTIONS:

1. Follow State or local health department requirements.
2. Review the food recall notice and specific instructions that have been identified in the notice. Notify the central office that the notice was received and understood.
3. Check receiving documents, perpetual inventory, requisitions, production records, and shipping records to identify products matching the product code or GTIN and lot numbers identified in recall notice.
4. Quarantine the recalled product using the following steps:
   - Physically segregate the product, including any open containers, leftover product, and food items in current production that items contain the recalled product.
   - If an item is suspected to contain the recalled product, but label information is not available, follow the district's procedure for disposal.
5. Mark recalled product "Do Not Use" and "Do Not Discard." Inform the entire staff not to use the product.
6. Do not destroy any products until directed to do so by the central office official e.g., School Nutrition Director.
7. Identify and record whether any of the product was received at the site, the status of the product e.g., used, on-hand, and verify that the food items bear the product identification code(s) and production date(s) or lot number listed in the recall notice.
8. Notify shipping sites of any recalled product shipped, date shipped, and other specific directions to be followed per the recall notice.

THE UNIT SUPERVISOR WILL:

Train employees on using the procedures in this SOP.

MONITORING:

The manager will visually observe that employees have segregated and secured all recalled products.

CORRECTIVE ACTION:

Retrain any employee found not following the procedures in this SOP.

(Sample SOP)

VERIFICATION AND RECORD KEEPING

1. Employees will record the name and product code or GTIN, quantity, lot number of the recalled food, date, and time on the Damaged or Discarded Product Log.
2. The manager will verify that appropriate corrective actions are being taken by reviewing, initialing, and dating the Damaged or Discarded Product Log each day. Maintain the Damaged or Discarded Product Logs for a minimum of 1 year.
3. Update perpetual inventory record with adjustment – recall.

DATE IMPLEMENTED: _____ **BY:** _____

DATE REVIEWED: _____ **BY:** _____

DATE REVISED: _____ **BY:** _____

Adapted from: National Food Service Management Institute. (2002). *Responding to a Food Recall.* University, MS: Author.

Inventory Management and Tracking Checklists

The following checklists may be used along with SOPs for monitoring site and central office processes affecting inventory. The central office checklist should be used at least twice per year. The site checklist should be used a minimum of once per month.

Central Office Inventory Management and Tracking Checklist

TASK	STATUS		
Menu Planning	**Yes**	**No**	**Corrective Action**
Cycle menus are used.			
Menus are planned centrally with one menu used for each site or production type (e.g., elementary schools, satellite schools)			
Both reimbursable meals and a la carte offerings are specified on menus and production records.			
Menu selections are based on production and sales history.			
Menus offer only items with sales of at least 25 servings.			
Menus are planned by January of prior year so that USDA Foods orders and bids can be based on menu forecasts.			
Procurement	**Yes**	**No**	**Corrective Action**
Only items on menu are included on bid.			
Only items with daily sales of 25 or more servings on average per site are included on bids.			
Specific product code numbers or GTIN numbers are included in bid specifications for pre-approved items.			
Bid instructions require vendors to specify product code numbers or GTINs in bid responses.			
Once bids are accepted, only products with specified product codes are accepted for delivery unless a substitution is approved in advance.			
Menus are provided to vendors in advance of orders.			
GLN numbers are obtained for the district and each delivery site.			
Vendor and delivery site GLNs are included on invoices and advanced shipping notices.			
Forecasting and Ordering	**Yes**	**No**	**Corrective Action**
Managers are provided with an ordering calendar specifying when each order is to be placed.			

TASK	STATUS		
Forecasting and Ordering	**Yes**	**No**	**Corrective Action**
Par values are set for applicable items.			
Managers do not have to place orders when an order is still in transit (placed but not received).			
Managers are provided order guides matching menus.			
Orders are approved by supervisor.			
Receiving	**Yes**	**No**	**Corrective Action**
Site personnel are provided with an SOP for receiving.			
At least one employee at each site is trained in receiving procedures.			
Receiving personnel are provided with product specifications including product codes or GTINs.			
Bids contain requirements for delivery times so that deliveries are made when receiving personnel are available.			
Receiving complaints are logged so that poor vendor performance can be addressed and mitigated.			
Storage	**Yes**	**No**	**Corrective Action**
Storage areas keys are distributed to only those requiring access and are signed for when issued.			
An SOP is provided to site managers and personnel covering kitchen visitors and customers access to storage and preparation areas.			
An SOP is provided to site managers and personnel covering proper dry, refrigerated, and freezer storage.			
An SOP is provided to site managers and personnel on the issuing process.			
Inventory Control	**Yes**	**No**	**Corrective Action**
Inventory level goals (e.g., days of inventory on hand) are established for each site.			
Site inventory levels are monitored monthly and corrective action is taken when needed.			
Automated or manual perpetual inventory systems are in use.			

TASK	STATUS		
Product codes or GTIN and lot numbers are required in inventory records (e.g., perpetual inventory cards, storeroom requisition)			
Follow-up is performed when there are discrepancies between "book" value and physical inventory to determine cause.			
Physical inventories are required on the last working day of each month.			
Inventory Control	**Yes**	**No**	**Corrective Action**
Food cost goals (as a % of revenue) are set for each site and shared among all site managers.			
Cost of food used is calculated each month for each site.			
Production	**Yes**	**No**	**Corrective Action**
Production records have columns for waste and cost so that managers can see the value of food wasted.			
Production records are preprinted to match menus.			
Production records contain product codes or GTIN and have blank cells for lot numbers.			
Recipes are developed so that typical production will match pan size and smaller pans are specified for smaller batches.			
An SOP is provided to site manager and employees covering disposal of unusable leftovers.			
Service	**Yes**	**No**	**Corrective Action**
Policies are developed for how theft will be handled for employees, customers, and vendors.			
Portion sizes and serving utensils are specified on menus and/or production records.			
Sales inventory records are used on each serving line, at least for a la carte items, to track sales of each item.			

Site Inventory Management and Tracking Checklist

TASK	STATUS		
Menu Planning	**Yes**	**No**	**Corrective Action**
Menus are consistently followed. Pre-approved substitutions are made when necessary.			
Feedback is provided to menu planners about popularity of menus based on production and sales records.			
Any issues with menu quality or difficulty of preparation are reported to the menu planner.			
Forecasting and Ordering	**Yes**	**No**	**Corrective Action**
Order guides are used when placing orders.			
Forecasting and Ordering	**Yes**	**No**	**Corrective Action**
Par values are used for applicable items.			
Production records from previous menu cycle are used for forecasting production.			
Only items needed to prepare menu selections are ordered.			
Inventory is checked before placing orders.			
Receiving	**Yes**	**No**	**Corrective Action**
Site personnel follow the SOP for receiving.			
Only trained employees receive food and supplies.			
GTIN or product codes are checked and lot numbers recorded when products are received. 			
Products sold by weight are weighed when received.			
Product substitutions are not accepted unless pre-approved.			
Storage and Issuing	**Yes**	**No**	**Corrective Action**
Storage areas are kept locked throughout the day, especially during meal service.			
An SOP is followed for kitchen visitors and customers access to storage and preparation areas.			
An SOP is followed for proper dry, refrigerated, and freezer storage.			
An SOP is followed on the issuing process.			

TASK	STATUS		
Inventory Control	**Yes**	**No**	**Corrective Action**
Inventory level meets specified goals e.g., days of inventory on hand.			
Physical inventory is taken on the last day of each month.			
Two employees are assigned to take physical inventories.			
A perpetual inventory is maintained daily.			
Product codes or GTIN, lot numbers, and storage location are recorded in inventory records (e.g., perpetual inventory cards, storeroom requisition).			
Storage areas are labeled with product codes and organized with highest volume products closest to the door.			
Products are kept in original cases and lot numbers are written on inner packages (or cut from case and kept) when removed from case.			
Inventory Control	**Yes**	**No**	**Corrective Action**
Heavy items are kept on lower shelves. Dollies, dunnage racks, and carts are used to store food.			
Chemicals are stored away from food and paper supplies.			
Production	**Yes**	**No**	**Corrective Action**
Production records are completed immediately after each meal.			
Production records are completed with product codes or GTIN and lot numbers.			
Food is prepared by cooking small batches every 30 minutes or before each serving period.			
Stockout times are recorded on production records to improve future forecasts.			
An SOP is followed for disposal of leftovers.			
Service	**Yes**	**No**	**Corrective Action**
Specified portion sizes and serving utensils are used.			
Sales inventory records are used on each serving line, at least for a la carte items, to track sales of each item.			

Appendix: Language for Bids and Processing Agreements

Recipient Agency and Distributor Agreement (Excerpts)

Food Defense Responsibilities

Distributor must have Hazard Analysis Critical Control Point (HACCP) and food defense plans on file that may be reviewed by school district for recall procedures. This should include, but not be limited to:

a) Distributor must have traceability systems in place from receipt to delivery to designated delivery site.

b) Distributor must provide evidence of conducting a mock recall for product once per year.

c) Distributor must provide 24/7 accessibility of staff in the event of a USDA Recall—individuals with contact numbers and back ups must be provided with the bid document.

d) Distributor must have public notification capability on website to provide updates on USDA Recall information for customers.

OR

e) Distributor must provide a communication plan to the school district for food recalls.

Distributor Responsibilities

Reporting and Reimbursement:

a) Distributor agrees to provide school district with a report of product usage by item code and manufacturer (in lieu of data transfer) in a format specific by school district.

OR

b) The Distributor agrees to provide data transfer of product usage by item code and manufacturer to school district's designated system via electronic channels either daily or weekly (choose one). File format is listed below.

c) The Distributor agrees to provide a monthly remaining USDA Foods product inventory report to the school district.

Type of Data Transmission: Fixed Length Flat File

Length	Position	Description
10	1-10	Distributor Number (assigned by Processor)
35	11-45	School District Name
35	46-80	School District Address1
35	81-115	School District Address2
35	116-150	City
03	151-153	State
10	154-163	Zip Code
16	164-179	Phone
20	180-199	Invoice Number (Distributor)
10	200-209	Invoice Date
18	210-227	Processor's Product Code
18	228-245	Case Count
13	246-258	Allowance Amount
10	259-268	School number assigned by Distributor
15	269-283	School Recipient Agency # (assigned by State)
10	284-293	Catch Weight Pounds
10	294-303	Bid Number
10	304-313	Vendor number (Distributor's number for Processor)

Note:

- Numeric values should be right justified within data element length and should not be preceded by zeros.
- Non-numeric values and dates should be left justified within data element length
- Dates should be in the format: 05/21/2010 (four digit year)
- Use a file name that identifies distributor name and date (i.e., abcdistribution_093004)

Adapted from: American Commodity Distribution Association. (2010). *Recipient agency commodity processing handbook. Appendix 11.*

Resources

Manuals

American Commodity Distribution Association. (2006). *Food safety/food defense response plan.* http://www.commodityfoods.org/files/FOOD%20SAFETY%20RESPONSE%20PLAN.doc

American Commodity Distribution Association. (2010). *Recipient agency commodity processing handbook.* http://www.commodityfoods.org/files/RA%20Processing%20Handbook%20-%20FINAL%20March%202010.pdf

U.S. Department of Agriculture, Food and Nutrition Service. (2004). *A biosecurity checklist for school nutrition programs: Developing a biosecurity management plan.* FNS-364 http://healthymeals.nal.usda.gov/hsmrs/biosecurity.pdf

U.S. Department of Agriculture, Food and Nutrition Service, & National Food Service Management Institute. (2005). *HACCP-based standard operating procedures (SOPs).*

U. S. Department of Agriculture, Food and Nutrition Service, & National Food Service Management Institute. (2011). *Responding to a food recall.*

Website Resources

American Commodity Distribution Association
http://www.commodityfoods.org/index.php

American National Standards Institute (ISO 22000:2005, ISO 22005:2007)
http://www.ansi.org/

Best if Used - By – USDA Guidance for Inventory Control in Schools and Warehouses
http://www.fns.usda.gov/FDD/facts/biubguidance.htm

Choice Plus: A Reference Guide for Foods and Ingredients
http://www.nfsmi.org/documentlibraryfiles/PDF/20080201030612.pdf

Commodity Alert System (USDA Foods recall notification)
https://www.envoyprofiles.com/USDA-ALERTS/

From Field to Fork, Archive for the 'Traceability' Category, Produce Marketing Association (PMA)
http://fieldtofork.pma.com/?cat=17

Federal Food Safety Information (commercial recall notification)
http://www.foodsafety.gov/keep/recalls/

Food Safety and Inspection Service
http://www.fsis.usda.gov/About_FSIS/index.asp

Foodservice GS1 US Standards Initiative
http://www.gs1us.org/faqs/foodservice_faqs

Food Safety Working Group
http://www.foodsafetyworkinggroup.gov/

Global Food Safety Initiative (GFSI)
http://www.ciesnet.com/2-wwedo/2.2-programmes/2.2.foodsafety.gfsi.asp

Institute of Food Technology – Food Product Tracing
http://www.ift.org/knowledge-center/focus-areas/food-safety-and-defense/traceability.aspx

Meat Poultry Group
http://www.mpxml.org/

Produce Traceability Initiative
http://www.producetraceability.org/

Recall Alerts
www.recalls.gov

Safe Quality Food Institute (Standards SQF 1000/SQF 2000)
http://www.sqfi.com/standards/

USDA Foods Fact Sheets
http://www.fns.usda.gov/fdd/schfacts/default.htm

USDA Web-based supply chain management
http://www.fns.usda.gov/fdd/WBSCM/default.htm

References

Alfaro, J.A., & Rabade, L.A. (2009). Traceability as a strategic tool to improve inventory management: A case study in the food industry. *International Journal of Production Economics, 111*, 104-110.

American Commodity Distribution Association. (2006). *Food safety/food defense response plan.* Retrieved March 4, 2010 from http://www.commodityfoods.org/files/FOOD%20SAFETY%20RESPONSE%20PLAN.doc

American Commodity Distribution Association. (2010). *Recipient agency commodity processing handbook.* Retrieved March 4, 2010 from http://www.commodityfoods.org/files/RA%20Processing%20Handbook%20-%20FINAL%20March%202010.pdf

Becker, G.S. (2009, December). The federal food safety system: A Primer. *CRS Report for Congress*, Congressional Research Service, Order code: RS-26600. Retrieved April 7, 2010 from http://www.nationalaglawcenter.org/assets/crs/RS22600.pdf

Daft, L., Arcoss, A., Hallawell, A., Root, C., & D.W. Westfall. (1998). U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis and Evaluation. *School food purchase study*. Retrieved on April 27, 2010 from http://www.fns.usda.gov/ora/menu/published/FoodDistribution/FDStudies.htm

Efficient Foodservice Response. (2000). Standard product ID and bar coding: Foodservice case studies and practical applications. Retrieved January 15, 2010 from http://www.ifdaonline.org/webarticles/articlefiles/544-Product_ID_and_Barcodes_Case_Studies.pdf

Farsad,B., & LeBruto, S. (1993). A measured approach to food-inventory management. *Cornell Hotel and Restaurant Administration Quarterly, 34*(3), 90-95.

Fleming, G., & Gombas, D.E. (2009). Continuous improvement trends in produce traceability. *Food Safety Magazine, April/May 2009*. Retrieved on March 29, 2010 from http://www.foodsafetymag-digital.com/foodsafetymag/20090405/#pg32

Food Marketing Institute. (2008). *SQF 2000: A HACCP-based supplier assurance code for the food manufacturing and distributing industries, 6th ed.* Retrieved on March 31, 2010 from http://www.scscertified.com/docs/SQF2000_Code_Ed_6_August_08.pdf

Food Marketing Institute. (2010). *SQF 1000: A HACCP-based supplier assurance code for the primary producer, 5th ed.* Retrieved on March 31, 2010 from http://www.scscertified.com/docs/SQF1000_Code.pdf

Food Safety Enhancement Act, HR 2749, 111th Cong. (2009).

Food Safety Modernization Act, S510, 111th Cong. (2009).

Food Safety Working Group. (2009). Food safety working group: Key findings. Retrieved from on December 27, 2009 from http://www.foodsafetyworkinggroup.gov/ContentKeyFindings/HomeKeyFindings.htm

Golan, E., Krissoff, B., Kuchler, F., Nelson, K., and Price, G. (2004). *Traceability in the U.S. food supply: Economic theory and industry studies.* Report 830. Retrieved on August 23, 2011 from http://www.ers.usda.gov/publications/aer830/aer830.pdf

Gregoire, M.B. (2010). *Foodservice organizations: A managerial and systems approach*. 7th ed. Upper Saddle River, NJ: Pearson Prentice Hall.

Grocery Manufacturers Association. (2008). *Food supply chain handbook*. Retrieved on April 7, 2010 from http://www.gmaonline.org/downloads/technical-guidance-and-tools/GMA_SupplyChain2.pdf'

GS1. (2009, February). *GS1 Standards document: Business process and systems requirements for full chain traceability Issue 1.1.0.* Retrieved on December 27, 2009 from http://barcodes.gs1us.org/dnn_bcec/Documents/tabid/136/DMXModule/731/Command/Core_ViewCollection/Default.aspx

GS1. (2009, December). *U.S. meat and poultry traceability: Implementation guide, Issue 1-10 22.23.* Retrieved on April 7, 2010 from http://www.mpxml.org/_Documents/mpXML%20Trace%20Guide%20June%202010.pdf

Institute of Food Technologists. (2009). *Product tracing in food systems, (Executive Summary).* Retrieved on December 15, 2009 from http://www.ift.org/knowledge-center/focus-areas/food-safety-and-defense/~/media/Knowledge%20Center/Focus%20Areas/Traceability/ExecutiveSummary.pdf

International Food Distributors Association, & GS1 US. (2006). *Foodservice and Data Synchronization.* Retrieved on April 7, 2010 from http://www.ifdaonline.org/webarticles/anmviewer.asp?a=543&z=71

International Standards Organization (2005). *Food safety management systems: Guidance on the application of ISO 22000:2005, 1st ed.*, ISO/TX 22004-2005(E).

Kasavana, M.L.(2010). Drive efficiency with effective inventory control – Part 1 &2. *Hospitality Technology*. Retrieved on March 8, 2010 from http://www.htmagazine.com/ME2/dirmod.asp?sid=8D86DF469BD74C098382D9532C904D8E&nm=&type=MultiPublishing&mod=PublishingTitles&mid=3E19674330734FF1BBDA3D67B50C82F1&tier=4&id=8D0FA931CD2C46B99204243D9C31F86B

Miller, D. (2009). Food product traceability: New challenges, new solutions. *Food Technology, 63*(1), 33-36.

National Food Service Management Institute. (2000). *Inventory Management for Child Nutrition Programs: 2000 breakfast lunch training.* ET20-00. University, MS: Author.

National Restaurant Association. (2008). *ServSafe© coursebook*. 5th ed. Chicago: Author.

Pannell-Martin,D.V. (2005). Cost control manual for school foodservices. 3rd ed. Aiken, SC: Author.

Produce Marketing Association. (2006). *Produce traceability: A guide to implementation*. Retrieved on April 7, 2010 from http://www.producetraceability.org/pdfs/CPMA_PMA_Traceability_Guide.pdf

School Nutrition Association. (2009). *School nutrition supply chain toolkit: A guide to efficient supply chain management*. Alexandria, VA: Author.

Stevens, E.M., (2009). Focus on food recalls: Guidelines for conducting a simulated food recall. Food Safety Magazine Retrieved on March 29, 2010 from http://www.foodsafetymagazine.com/article.asp?id=3482&sub=sub1

Surak, J.G., & Gombas, K.L. (2009). GFSI's role in harmonizing food safety standards, *Food Safety Magazine, June/July 2009*. Retrieved on March 29, 2010 from http://www.foodsafetymagazine.com/article.asp?id=3027&sub=sub1

Uniform Code Council (now GS1 US), Efficient Foodservice Response Supply Chain Demand Forecasting Committee. (2003). *Standard product identification and bar codes: The cornerstone of EFR.* Retrieved April 7, 2010 from http://www.ifdaonline.org/webarticles/articlefiles/544-Product_ID_and_Barcodes_cornerstones.pdf

University of Florida, Security Research Project. (2008). *National Retail Security Survey*. Retrieved on February 15, 2010 from http://soccrim.clas.ufl.edu/criminology/srp/srp.html

U.S.Department of Agriculture, Food and Nutrition Service. (2004). *A biosecurity checklist for school foodservice programs: Developing a biosecurity management plan.* FNS-364.Retrieved on August 23, 2011 from http://healthymeals.nal.usda.gov/hsmrs/biosecurity.pdf

U.S. Department of Agriculture, Food and Nutrition Service. (2008). *School lunch and breakfast cost study II: Summary of findings.* Retrieved on February 15, 2010 from http://www.fns.usda.gov/ora/MENU/Published/CNP/FILES/MealCostStudySummary.pdf

U.S. Department of Agriculture, Food and Nutrition Service, with the National Food Service Management Institute. (2002). *First choice: A purchasing systems manual for school food service.* 2nd ed. University, MS: National Food Service Management Institute.

U. S. Department of Agriculture, Food and Nutrition Service, with the National Food Service Management Institute. (2011). *Responding to a food recall*. University, MS: National Food Service Management Institute.

U.S. Department of Agriculture, Food and Nutrition Service, with the National Food Service Management Institute. (2005). *HACCP-based standard operating procedures (SOPs)*. University, MS: National Food Service Management Institute.

U.S. Department of Agriculture, Food Distribution. (2009). National Policy Memorandum FD-020: Single inventory and commodity issues—Clarification of regulatory changes and other guidance. Retrieved on December 15, 2009 from http://www.fns.usda.gov/fdd/PolicyMemo/pmfd020_CNP-SingleInventory.pdf

U.S. Department of Agriculture, Food Distribution. (2009). National Policy Memorandum FD-058: Annual physical inventory—Reconciliation of book inventory to physical inventory. Retrieved on December 15, 2009 from http://www.fns.usda.gov/fdd/policymemo/pmfd058_Annual%20Physical%20Inventory.pdf

U.S. Department of Agriculture, Food Distribution. (2009). National Policy Memorandum FD-067: School food authorities acting as a collective unit in the control and use of donated foods (revised). Retrieved on December 15, 2009 from http://www.fns.usda.gov/fdd/policymemo/pmfd067_NSLP-CollectiveUnitrev.pdf

U.S. Department of Health and Human Services, Office of Inspector General. (2009). Traceability in the food supply chain. OEI-02-06-00210. Retrieved on April 23, 2010 from http://oig.hhs.gov/oei/reports/oei-02-06-00210.pdf

U.S. Department of Health and Human Services, Food and Drug Administration. (2004). *Protecting the U.S. food supply: What you need to know about establishment and maintainance of records.* Retrieved on February 15, 2010 from http://www.fda.gov/downloads/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodDefenseandEmergencyResponse/UCM113920.pdf

Acronyms

AI	Application identifiers
AMS	Agriculture Marketing Service
CDC	Centers for Disease Control and Prevention
CTE	Critical tracking event
DHS	Department of Homeland Security
EFR	Efficient Foodservice Response
EPC	Electronic Product Code
EP&R	Emergency Preparedness and Response
FBI	Federal Bureau of Investigation
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FERN	Food Emergency Response Network
FSA	Farm Service Agency
FNS	Food and Nutrition Service
FSIS	Food Safety and Inspection Service
GDSN	Global Data Synchronization Network
GTIN	Global trade item number
GLN	Global location number
HACCP	Hazard Analysis and Critical Control Points
HHS	Department of Health and Human Services
RFID	Radio frequency identification tag
SOP	Standard operating procedure
SKU	Stockkeeping unit
TCS	Time and temperature control for safety
UPC	Universal product code
USDA	United States Department of Agriculture

Glossary

Application Identifiers (AIs): A section of a GS1 bar code found on product packaging enclosed in parentheses used to identify additional information such as weight, count, lot numbers, country of origin, and production date.

Adulterated: A product that has been contaminated with a foreign substance causing it to be unsafe for usage.

Batch Cooking: Preparing smaller quantities of food as needed throughout the serving period rather than preparing the total quantity needed at one time.

Bioterrorism: The deliberate use of biological, chemical, physical, or radioactive agents for the purpose of causing harm.

Brown box USDA Foods: USDA Foods labeled with plain USDA labels instead of a commercial label. The name originated from the brown shipping boxes used to ship these products.

Carrying costs: Costs for transporting, handling, and storing inventory.

Critical tracking event (CTE): A point at which a product is moved between sites, a product is transformed, or any point where a record is required in order to trace a product.

Cycle Menu: Menus that are repeated over a period of time e.g., every three weeks.

Cycle Counts: Physical count of a small group of randomly selected products on a periodic basis. Typically used in high volume operations when a monthly physical inventory may not be practical.

Efficient Foodservice Response (EFR): A voluntary initiative where members of the foodservice supply chain studies methods to eliminate waste and excess cost.

External supply chain: Members of the supply chain outside the school district including vendors, brokers, customers, and agencies that handle products or product information.

Foodborne illness: An illness carried or transmitted to people through food.

Global Data Synchronization Network (GDSN): An internet-based network of interrelated databases containing product information and the GS1 Global Registry that allows companies to exchange standardized and synchronized information with their trading partners.

Global Location Number (GLN): The GS1 Identification Key used to identify physical locations such as a manufacturing plant or legal entities such as the manufacturer's corporate office. The 13-digit key is comprised of a GS1 Company Prefix, Location Reference, and Check Digit.

Global Trade Item Numbers (GTIN): The GS1 Identification Key used to identify products such as a specific brand, unit of measure, and product code. The key is comprised of a GS1 or UPC company prefix and an item identification number.

Hazard analysis and critical control points (HACCP): A food safety system based on principles to identify, evaluate, and control hazards.

Indirect Discount: Applying a discount for the fair market value of USDA Foods on processed products on the invoice; also referred to as "net off invoice".

Internal supply chain: Members of the supply chain within the school district including district-owned warehouses, central production facilities, schools, the central school nutrition office, and the accounting department that handle products or product information.

Inventory: Food and supplies purchased for an organization but not yet used.

Lot: The batch or lot number that associates an item with information the manufacturer considers relevant for traceability of the trade item (e.g., the time and date the product was manufactured).

Par Value: The amount of product needed to fulfill menu requirements for one ordering period plus a small amount for safety stock.

Perpetual Inventory: Continuous recording of all receipts and issues of products in storage providing a balance of each item at all times.

Physical Inventory: Periodic actual count of products in storage areas.

Radio Frequency Identification Tag (RFID): An electronic tag encoded with an Electronic Product Code (EPC) used to identify products within a supply chain. The 14-digit GTIN number was designed so that it could be used as an EPC code in RFID tags.

Recall: A process used to remove products from the marketplace when there is reason to believe the products may be contaminated, misbranded, or cause health problems.

Safety Stock: A small amount of product kept on hand to accommodate an unexpected rise in customer demand or a late delivery.

Shelf Life: Length of time a food may be stored before safety or quality is diminished.

Shrink: Loss of product due to waste, damage, spoilage, and theft.

Single Inventory Method: Maintenance of a single inventory for all food and supplies, including USDA Foods.

Standard Operating Procedure (SOP): Detailed written instructions for a process that must be followed to ensure a desired outcome.

Stockkeeping units (SKU): An item of stock that is completely specified as to size, flavor, color, recipe, and any other attribute (e.g., two flavors of gelatin are different SKUs).

Stockouts: Running out of a stockkeeping unit when there is still demand for the item.

Supply chain: The system of interrelated departments, businesses, and agencies through which products, services, and product information flows beginning with raw materials and ending with the final customer.

Supply chain orientation: An organization's ability to build and maintain a culture and value system that supports relationships with supply chain partners.

Time and temperature control for safety (TCS) foods: Foods that need time and temperature controls to prevent the product from becoming unsafe due to biological hazards.

Traceability: The ability to trace the history, use, or location of a product.

Trace back or trace: The ability to determine the origin attributes or history of an item in the supply chain by referencing records held by each entity.

Trace forward or track: The ability to determine the path a traceable product takes through the supply chain on its way to the end customer.

Universal Product Codes (UPC): A 12-digit GTIN bar code used to uniquely identify a product and the company that owns the product brand.

USDA Foods: Foods purchased by USDA for use in school nutrition programs.