EFR
Efficient
Foodservice Response

Standard Product Identification and Bar Codes:

The Cornerstones of EFR

Written by:
EFR Supply Chain Demand Forecasting Committee and Uniform Code Council, Inc.

March 1998

(Revised January 2003)

EFR Reports

Enabling Profitable Growth in the Food-Prepared-Away-From-Home Industries (1997)

The Executive Committee believes that companies should understand certain key EFR enablers. The documents that discuss these enablers have been prioritized in the following order. The Committee recommends that you read and understand the concepts of each document in the order they are presented:

Standard Product Identification and Bar Codes: The Cornerstones of EFR (1998)

Getting Started In Electronic Commerce: Item, Price & Promotion Transactions (1998)

Electronic Commerce Phase II: Revenue Cycle Transactions (1998)

Activity Based Management for Foodservice: Getting Started (1999)

EFR Roadmap for Small and Medium Foodservice Businesses (1999)

Assessing Pallet Cost in Foodservice (2000)

Logistics Optimization: Profile of an Industry (2000)

Standard Product ID and Bar Coding: Foodservice Case Studies and Practical Applications (2000)

The Role of Bar Codes in Food Safety (2000)

A Roadmap to Success: Activity Based Management for Foodservice Distributors (2001)

Foodservice Category Management: A Systematic Approach to Balancing Product Variety and Duplication in the Supply Chain (2001)

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This document, originally published in 1998, was revised in 2001 and again in 2003 to reflect changes in standard product identification and bar code terminology. This updated version incorporates new, global nomenclature as established by the Uniform Code Council and adopted by EFR.

EFR Sponsors

The following organizations are sponsors of the Efficient Foodservice Response Initiative:

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About Efficient Foodservice Response

In late 1994, the International Foodservice Manufacturers Association (IFMA) and the International Foodservice Distributors Association (IFDA) provided the catalyst for the formation of an ad hoc group comprised of representatives from foodservice manufacturers, brokers, distributors, operators and key industry trade associations. The group was formed to examine Efficient Consumer Response (ECR), a grocery industry initiative, and its relevance to the foodservice supply chain. Group members also explored ways to work with ECR pioneers.

After weathering a severe snowstorm during its first meeting, which was hosted by Rich Products in Buffalo, New York, in January 1995, the team became known as the Buffalo Blizzard Group.

Several members had been involved with ECR, and all—directly or indirectly—had observed its implementation in the grocery supply chain. All had seen ECR's impact since its introduction in 1993. To date, its results include increased supply chain efficiency and improved competitive dynamics—both facilitated by more cooperative channel-trading relationships.

While grocery represents the "food-prepared-at-home" half of the food supply chain, foodservice represents the other half, or "food-prepared-away-from-home." Since one complements the other, the "Buffalo Blizzard Group" questioned whether an ECR-like initiative in the foodservice supply chain would make sense. Although many ECR principles are relevant to the foodservice supply chain, the difference between foodservice and the grocery industry is significant enough that total ECR adoption is not appropriate.

The group also recognized that motives for change in the foodservice supply chain differ from the grocery industry's and that the foodservice industry would require its own economic case for action. The motives for beginning ECR—as well as the Quick Response movement in the general merchandise channel before it—included heightened competition from alternate trade channels. Dramatic increases in imports from countries with drastically lower labor rates in the mid-1980s gave rise to Quick Response. The growth of grocery sales in the alternative format store sector was the catalyst for ECR.

In contrast, the foodservice supply chain of the early 21st century faces no such outside threats. Conditions are ripe, however, for development of such threats. The foodservice supply chain features many of the characteristics other supply chains possessed before they lost market share to alternative competition. They include:

- Mistrust and lack of cooperation between supply chain trading partners.
- Pervasive lack of focus on providing value to the consumer.
- Archaic business practices that complicate trade between buyers and sellers.

- Poor penetration of modern supply chain practices and information technologies which could enable quantum leaps in effectiveness and efficiency.

After adopting "EFR" as the name of the initiative and developing a logo, the group commissioned a study to accomplish three objectives:

- Quantify the cost of inefficiencies to the foodservice industry.
- Define the strategies that comprise EFR and remove non-value-adding costs.
- Educate the industry about EFR.

In August 1995, the group selected Computer Sciences Corporation (CSC) to fulfill these objectives. CSC proposed a collaborative effort with the Stanford Supply Chain Forum at Stanford University. CSC features a core competency in supply chain management consulting and helped develop ECR. Stanford University brought academic credibility, objectivity and relevant research into supply chain economics and modeling.

The EFR study shows there are $14.3 billion in non-value-adding costs accruing throughout the foodservice supply chain. This figure represents the potential benefit of EFR to the total supply chain, and applies almost equally to operators, distributors and manufacturers/brokers. It should be noted that this figure is extremely conservative and based on today's technology. Nothing needs to be invented to capture these benefits—they represent an attainable goal, not a theoretical maximum in an ideal world. In reality, $14.3 billion is the tip of the iceberg. Actual cost savings opportunities are much higher.

EFR is intended to align efforts throughout the foodservice supply chain to build a solid platform for profitable growth. The $14.3 billion figure simply represents the benefit of this platform. Foodservice supply chain professionals, after establishing a foundation, should be able to focus on a slice of the $800 billion in incremental industry growth potential. EFR is not a destination; it is a pathway to a new era of renewed prosperity for the foodservice industry.

The EFR mission statement is presented below. While it contains many words, it is summed up as a philosophy that can be shared by all supply chain participants and geared to eliminate costs that do not add value to the consumer. Further, meeting this objective, which is common to all supply chain segments, will create a stronger, more competitive, and more profitable business environment and will provide lasting value for the consumer.

EFR Mission

> Efficient Foodservice Response (EFR) is the voluntary undertaking of planned and directed activities among all the partners in the value chain to achieve a low-cost, high-performing value chain. The purpose is to eliminate inefficiencies and wasteful practices, thereby enhancing the ability of each party to compete fairly and vigorously. Each functional component in the chain works in unison with the others to increase value, while minimizing the cost burden on any other value chain component. Thus, the value chain is closely synchronized, highly flexible, reliable and responsive to customer demands, with short cycle times and lower total value chain costs from raw material ingredient supplier to consumption.

This mission is accomplished via the study of five strategies that comprise a number of interrelated initiatives. The initiatives within each strategy progress from basic to advanced capabilities, allowing diverse organizations to develop unique implementation paths within a common EFR framework. As an overview, the five EFR strategies are:

Equitable Alliances—These are the building blocks that support EFR implementation and the attainment of benefits. Initiatives included address the complex funds flow within the supply chain and how value is measured. A fundamental initiative is activity-based costing which builds the foundation for initiative bundling and value-based incentives. There is no economic benefit attributed to this strategy as it is a "cost-neutral" mechanism that enables shifts in the way costs and revenues accrue in the supply chain.

Supply Chain Demand Forecasting—This strategy encompasses initiatives that create a supply chain characterized by a common view among trading partners of end-consumer demand coupled with an integrated set of planning processes. The industry benefit reaped from implementation of initiatives within this strategy is estimated to be $2.9 billion.

Initiatives within supply chain demand forecasting integrate demand creation and demand fulfillment processes across all segments. These initiatives include standard product identification and bar coding, common product information databases, demand and planning information sharing, and market-level reporting and forecasting.

Electronic Commerce—Electronic Commerce is the largest EFR initiative in terms of quantified benefits. The initiatives that comprise this strategy represent a $6.6 billion savings opportunity across all industry segments. Most of these benefits come from reduced administrative cost resulting from streamlining the revenue cycle processes between supply chain buyers and sellers. The five integrated initiatives include business process simplification, EDI product maintenance (electronic data interchange), revenue cycle EDI, electronic funds transfer, and invoice-less payment. An initiative origi-

nally identified as part of the supply chain demand forecasting strategy—common product information databases—is also being addressed by electronic commerce.

Logistics Optimization—Logistics Optimization is a set of initiatives with a goal of optimizing the end-to-end total supply chain costs across all segments. Initiatives dealing with physical flows from point-of-supply to point-of-consumption are represented within this strategy. These include direct shipment, consolidation, shared distribution, coordinated transportation and cross-docking. The industry benefit attributed to implementation of logistics optimization is $2.7 billion.

Foodservice Category Management—This strategy includes initiatives to profitably manage the inherent complexity of a supply chain that produces millions of end products in a variety of service configurations. Its industry benefit is estimated to be $2.1 billion. Initiatives within foodservice category management address the way the supply network is loaded with products against the marketplace's raw demand. They include balanced variety, product deletions, new products, and centralized conversion.

These five EFR strategies are designed to create a more effective end-to-end supply chain. Only a holistic view of the supply chain as a whole machine will create a truly effective supply chain that optimizes value creation process from end to end. Consequently, the EFR studies can assist trading partners as they consider changing the way they conduct business. Achievement of EFR's mission rests with the senior executives from companies that make up the foodservice supply chain. Success requires these executives' vision and support.

By striving to improve their business process, companies within the foodservice industry have a unique opportunity to strengthen as well. The Efficient Foodservice Response project provides important analytical tools to help our industry prepare for the next millennium.

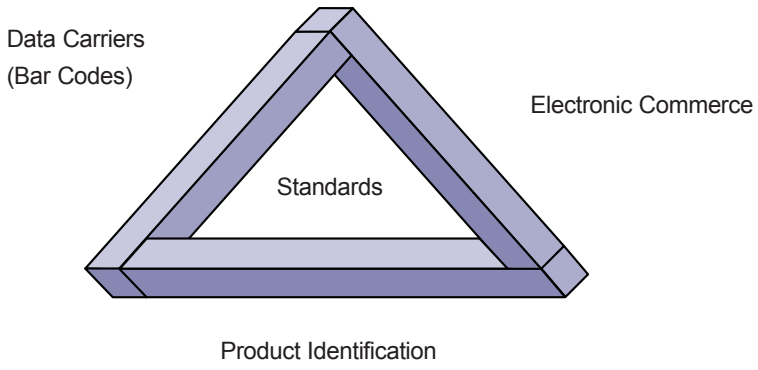
The EFR Executive Committee encourages you to begin understanding the EFR strategies. The committee is making every effort to support the industry by providing these educational documents and creating an arena for industry-wide continuous improvement.

Executive Summary

With the advent of Efficient Foodservice Response (EFR), the need to communicate product information in a more accurate, consistent and expedient fashion has become paramount in the foodservice industry. In order to facilitate this need, the EFR Executive Committee recommends voluntarily standardizing the method to identify products and using proven technologies such as bar coding and electronic commerce mediums to move product information through the foodservice supply chain.

These technologies strongly rely upon a standard identification number for a product. Without a standardized way of identifying the product, the technologies would serve only to automate complexity and inaccurate or inconsistent information and would therefore increase the chance for errors. It is with these issues in mind that the EFR Executive Committee has made voluntary implementation of standard product identification and bar coding its highest priority. These are the *cornerstones of EFR.*

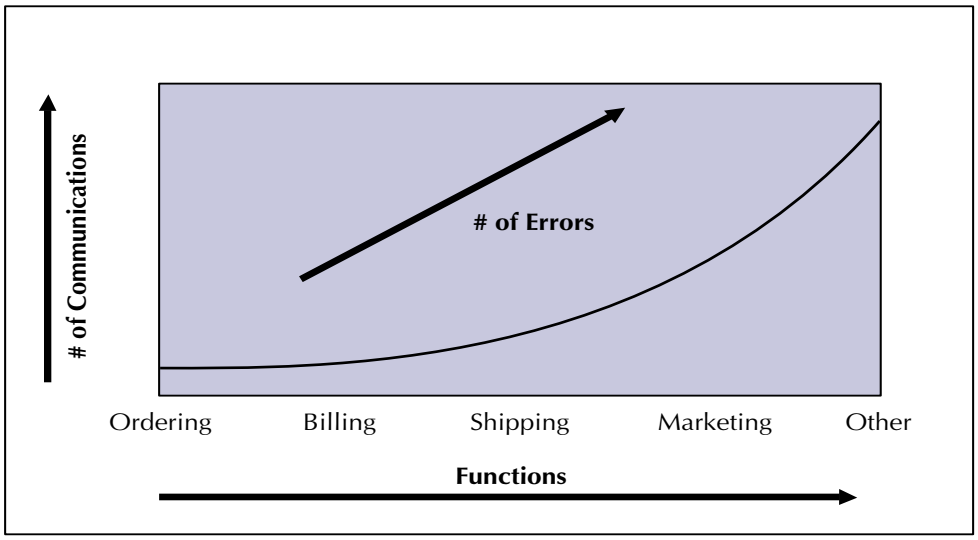
Figure 1.1
Supply Chain Communication Tools



The document that follows focuses on standard product identification and bar coding. It is the intent of this document to inform, guide and amplify the use of these important cornerstones to the foodservice industry. It will INFORM the foodservice industry on what is meant by "standard product identification" and what "bar codes" are; it will GUIDE the foodservice industry as to which product identification numbers and bar codes should be used; and, finally, it will AMPLIFY the battle cry of getting all members of the foodservice industry to make the necessary changes to begin using these cornerstones.

Why is it so important to standardize the way we identify products? It has been painfully clear that members of the foodservice industry have different ways of identifying a product: some suppliers use the Global Trade Item Number (GTIN) (the UCC-12 contained in the U. P. C. is most common), some use their own internal number, some use the distributor's number and still others use the operator's number… all for the same product. As members of the supply chain communicate with each other, each must cross-reference its product number with the other party's product number. As each function within a company uses this process, the chances for errors increase. As your communications on that product increase with additional members of the supply chain, the chances for error further increase. You can quickly see how using this process can create miscommunications.

Figure 1.2
Errors related to non-standardized product numbers



Additionally, someone on each side of the communication process has to maintain a database, or profile, that stores these different numbers. Today, the industry itself cannot control what numbers trading partners assign to a product. As a result, multiple numbers can be assigned to the same product, or, conversely, different products might share the same product number.

This process contributes to:

- additional time-consuming database management
- increase in database errors
- incorrect orders
- incorrect shipments
- incorrect invoices
- increase in invoice deductions
- mislabeled products
- inaccurate communications

What are the Benefits of Standardizing How Products are Identified?

As the product moves along the supply chain, think of how much more efficient it would be for all parties to reference the product based on the number shown on that product. The product, for example, could travel to the supplier's distribution facility from the plant using the number on the product, ordered by the distributor using the same number, ordered by the operator using the same number and billed to all appropriate parties using the same number. In addition, there would be no need to put an additional sticker on each product for the purpose of cross-referencing a new number for that product. Each member of the supply chain would be able to use one number to uniquely identify the product.

Here's just the tip of the iceberg:

- product number is unique anywhere in the world
- product number is tied to the label owner
- no duplicate numbers
- no cross-referencing needed
- no unnecessary database management and maintenance
- no misordering or misbilling due to wrong number
- no need to re-sticker product with internal SKU number
- communications are more accurate
- all members of the supply chain can reference the product using the same number
- timely dissemination of product information

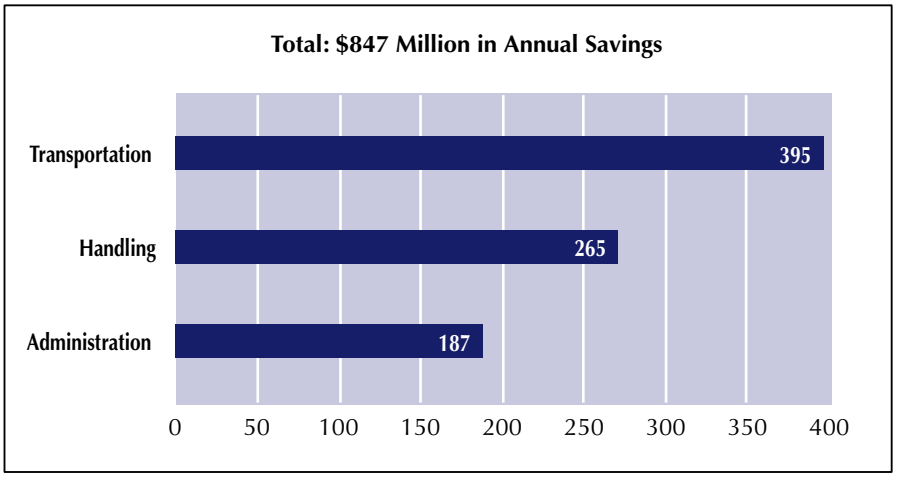
It is the recommendation of the EFR Executive and Steering Committees that the foodservice industry voluntarily adopt the Global Trade Item Number (GTIN), administered by the Uniform Code Council, as the solution to uniquely identify products within the foodservice industry. GTINs are currently being successfully used in many industries and countries throughout the world.

What are the Benefits of Bar Coding Products?

Bar coding products allows for information to be captured immediately once the product is scanned, thus eliminating the need to manually read and key the information into your systems. This information is not limited to just the identification of the product, but can include additional attributes of that product that are needed for a handler of that product. This is beneficial for members throughout the supply chain that physically handle the product. It will also reduce the labor associated with manually keying in the information and the time spent on errors caused by miskeying the data.

EFR has identified a potential savings of over $847 million annually for bar coding products. This is a result of streamlined transportation, handling and administration due to the efficiencies bar codes offer. See figure 1.3 for savings.

Figure 1.3
Standard Product ID & Bar Codes—Savings by Area



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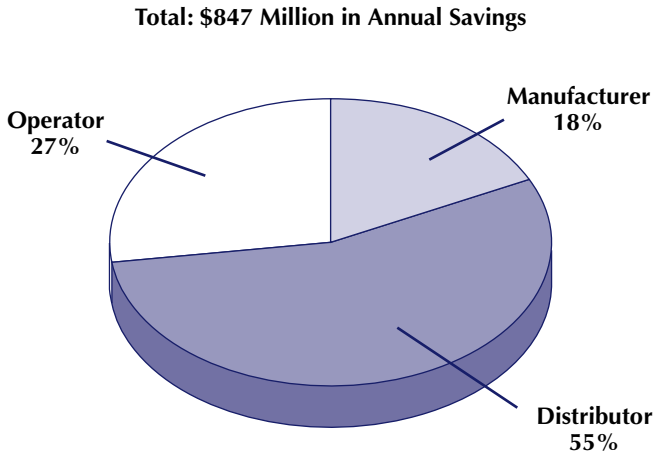
As suggested by the graph in figure 1.4, the distributor gets most of the savings from bar coding products due to handling the products twice: once when receiving from the supplier and again when shipping to the operator.

Figure 1.4
Standard Product ID & Bar Codes—Savings by Segment



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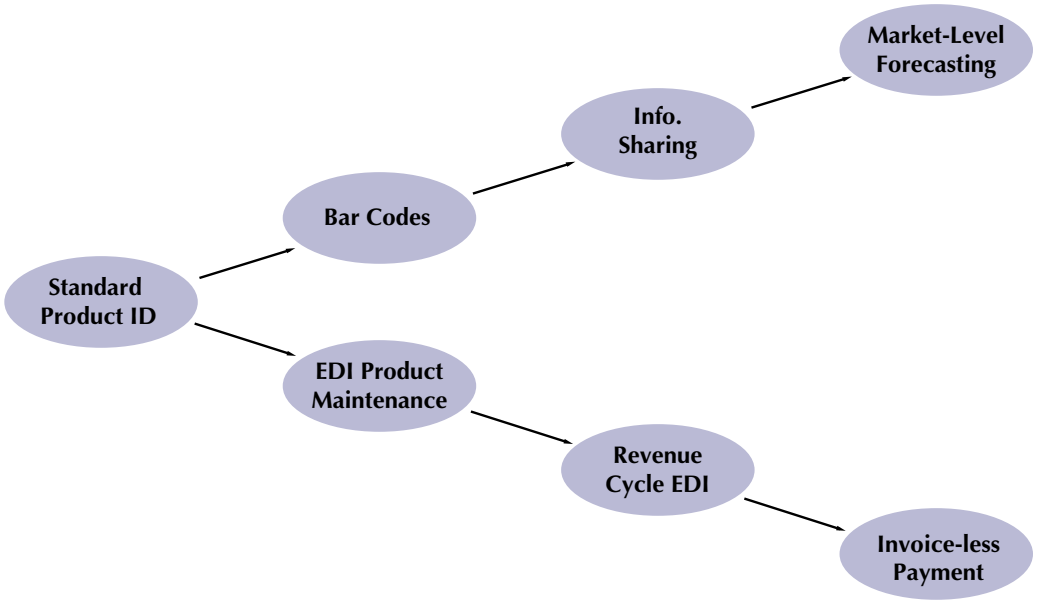
The number of business functions bar coding can impact is almost endless. However, due to the available technology and, more importantly, the cost of those technologies today, we will focus on certain technologies that can efficiently be used to add value to functions that physically handle the product through the pipeline: manufacturing, distribution, shipping, receiving and inventory. In all of these functions, bar coding offers a tremendous opportunity to have information about those products automatically captured and to receive the benefits derived from scanning bar codes each time the product is handled.

The importance of using the GTIN to standardize how products are identified cannot be overemphasized, as it is the crux of all other EFR initiatives (see figure 1.5). Each EFR strategy is based upon foodservice industry members referencing a product using the same number: the GTIN. As the process of handling the product is shared by virtually all

members of the supply chain, it is a natural extension of the GTIN to have the product bar coded so that it can be scanned by each member. These two cornerstones go hand in hand in helping create an efficient and effective supply chain and have already done so in other industries, including the retail grocery industry. The voluntary implementation of the GTIN and bar codes in the foodservice supply chain should therefore be familiar to those whose industries have already adopted these practices.

Figure 1.5
Standard Product ID and Bar Codes are the Cornerstones to Many EFR Initiatives



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Executive Role in the Implementation of EFR

In summary, as an executive of your company, it is important that you ensure this information is shared with and understood by the appropriate people inside your company, as well as those with whom you do business. As the GTIN will be used on products handled by each leg of the supply chain, they will greatly impact how administrative, financial, operational, warehousing, sales and marketing departments use these numbers. In addition, due to the variety of bar codes being used today with different ID numbers, having a voluntary standard for the industry can eliminate the need to manage various "means" to the same "end." Members of the foodservice industry now have a standard regarding how they identify products and how those products appear in the form of a bar code. The dollars expended due to the inefficiencies caused by having multiple numbers for the same product and having different bar codes to encode these numbers are far too exorbitant to allow the industry to continue in this fashion.

Should you, or members of your organization, have any questions regarding the ID numbers or bar code symbols, please contact the Uniform Code Council located in Dayton, Ohio at 937/435-3780, visit their web site at www.uc-council.org or send an e-mail for information to info@uc-council.org.

Acknowledgments

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Gordon Food Service
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Tyson Foods, Inc.
Venture Marketing Inc.
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International Foodservice Distributors Association
Uniform Code Council, Inc. (UCC)
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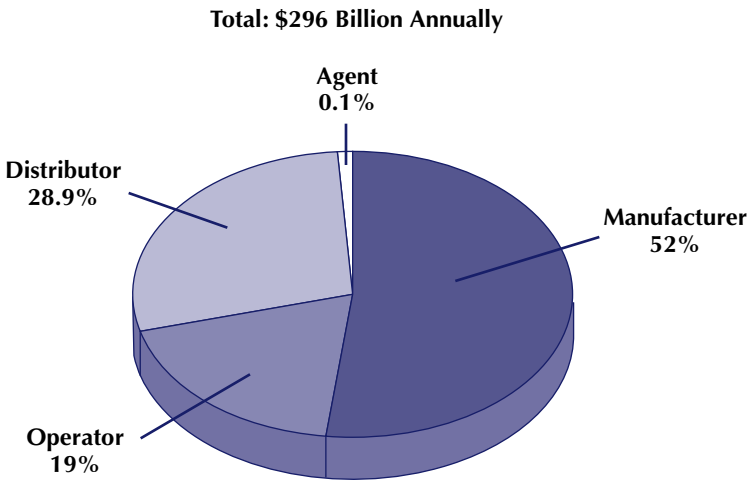
1

About the EFR *Supply Chain Demand Forecasting Committee*

Computer Sciences Corporation's (CSC) EFR report, *Enabling Profitable Growth in the Food-Prepared-Away-From-Home Industries,* reveals a savings opportunity of $2.96 billion through the Supply Chain Demand Forecasting strategy. This figure includes the cost of excess inventory, the cost of inefficient utilization of assets due to poor planning, and the cost of excess handling and transportation charges throughout the food-service pipeline.

Figure 2.1
Supply Chain Demand Forecasting—Savings by Segment



Enabling Profitable Growth in the Food-Prepared-Away-From-Home Industries (1997)

The objective of the EFR Supply Chain Demand Forecasting Committee (SCDFC) is to ensure voluntary processes, standards and technology/tools are in place, or available, so continuous and accurate demand forecasting will be a normal business practice in the foodservice supply chain. The forecasts should provide demand information between specific trading partners and within the overall chain. The immediate tools needed to get at this information are standardized product identification numbers using the GTIN and bar codes. Since these tools are the cornerstones of EFR and the thread that ties all of the component initiatives together, this area is where the SCDFC initially focused.

Once the industry has fully adopted the identification and marking of products at both the case and package levels, it can begin concentrating on sharing information between trading partners about these products throughout the supply chain. This will allow the linkage between customer demand and consumer foodservice sales, which is the backbone of customer demand data. This data is absent in the foodservice arena today as these two silos of information are largely separate. The connection of these silos is essential in order to generate the market-level reporting and forecasting needed in this industry.

2

Necessary Points of Clarification

Figure 3.1 is intended to ensure an understanding of what is meant by an "item," "package" or "product." These three terms are used interchangeably throughout this document. It could be a head of lettuce, as in figure 3.1, a bag of apples, or even more simply put, it is what you see once the case is opened. Once the case is open, you might see some inner packs. An example of an inner pack is individual candy bars inside a box of candy.

The case (see figure 3.2) is the primary level of packaging used in the ordering, shipping and billing processes.

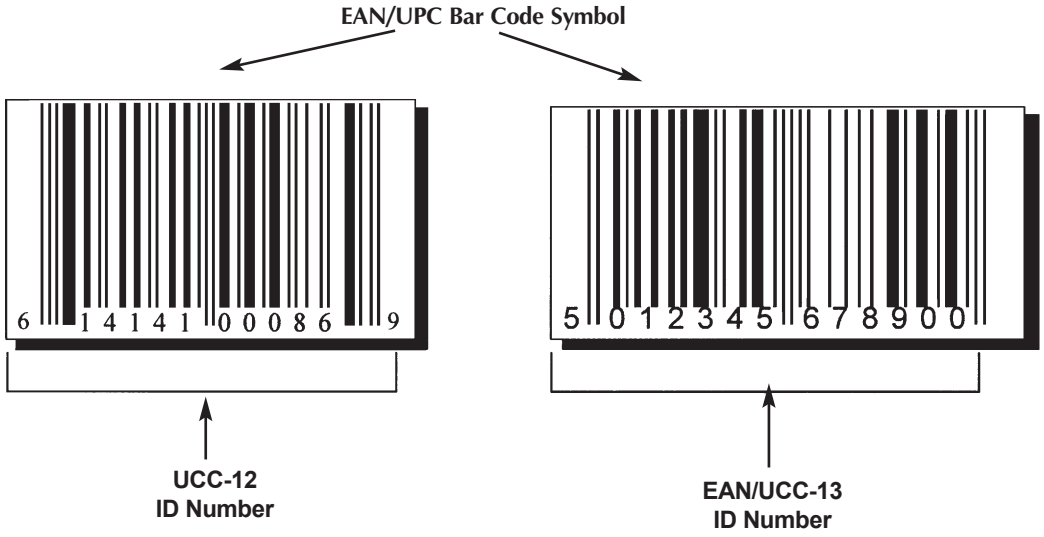
Figure 3.1
Example of "item," "package" or "product"

Figure 3.2
Case of product

Before we continue with discussions of bar codes and the numbers used to identify products, it is important to distinguish what is meant by the **ID number** vs. **the bar code symbol.**

The **ID number** (also referred to as the data structure) is the number and composition of digits used to identify the product. The product can be a package, a case, a pallet or some other unit. The ID numbers that comprise the GTIN are: UCC-12, EAN/UCC-13, EAN/UCC-14, and EAN/UCC-8. The length of the numbering scheme is located at the end of the nomenclature (i.e., the EAN/UCC-14 is a 14-digit number). Each numbering scheme has different flexibility suited for different purposes. We will address those that have application and relevance for the foodservice industry in Chapter 3.

Figure 3.3
ID Numbers and Bar Code Symbols



The **bar code symbol** (also referred to as the *data carrier*) contains the bars and spaces used to encode the numbering scheme. Some familiar bar code symbols that are used across the world include: EAN/UPC, ITF-14 (a specific application of Interleaved 2 of 5) and UCC/EAN-128. Although the nomenclature sounds technical, it's just a name for the bar code symbol and should simply be viewed as a name. In Chapter 4, we will address each symbol as it has application and relevance to the

foodservice industry. As is the case for different numbering schemes, so it is with bar code symbols: they each have different flexibility suited for different purposes.

Now that we know the difference between the two terms, let's answer a question that is typically asked at this juncture: "Can you put any ID number into any one of the bar code symbols?" As depicted in figure 3.4, the answer is no. However, you need to understand each of the bar code symbols to understand why the answer is no (see Chapter 4).

Figure 3.4

Numbering Scheme	# of digits	Bar Code Symbol	Primarily Used on:
UCC-12	12	UPC-A, UPC-E	Products
EAN/UCC-13	13	EAN-13	Products
EAN/UCC-8	8	EAN-8	Products
EAN/UCC-14	14	ITF-14, UCC/EAN-128	Cases, Pallets

Note that in the above figure an EAN/UCC-14 number can be encoded in either an ITF-14 or a UCC/EAN-128 bar code symbol.

Finally, it is important to understand that the recommendations of the EFR Executive Committee and the Supply Chain Demand Forecasting Committee are based on existing public standards. Implementation of these standards is voluntary and the decision to implement is that of each individual company. Any discussion of standards or guidelines in this document assumes that individual companies will voluntarily choose whether or not to implement them.

3

Standard Product Identification

What is meant by "standard product identification"? For the purpose of this document, **standard product identification** is the GTIN, which is used to uniquely identify a product for reference among all participants of the supply chain. More simply put, it is the *one number* that is used by all members in the supply chain to reference that particular product.

GTIN is often misunderstood. One common *misunderstanding* is to think that one centralized organization creates a GTIN for every product in the industry that partners can point to and use as the standard number for that product. This is *not* the case. The GTIN is issued by the owner of the label, typically the manufacturer. What makes the GTIN "standard" is that it follows one set of rules that allow the number assigned to the product to be unique anywhere in the world.

Why use a standard product identification number?

As the GTIN is used throughout various legs of the supply chain (procurement, packaging, distribution, transportation, shipping, billing, etc.), having one number to reference the product will eliminate the problems associated with having multiple numbers that reference the same product. Within the foodservice industry, there currently can be up to four different numbers for the same product: the numbers assigned by the manufacturer, the broker, the distributor and the operator, all for the same product. This assignment method creates the need for the supply chain to manage four different databases, each having its own SKU number for the product being cross-referenced to the trading partner's version of the product number. This is an invitation for errors, such as ordering the wrong product, invoicing the wrong product, shipping the wrong product, mislabeling the product, updating the database with the wrong product information and many others.

Some of the benefits of using the GTIN way of identifying numbers include:

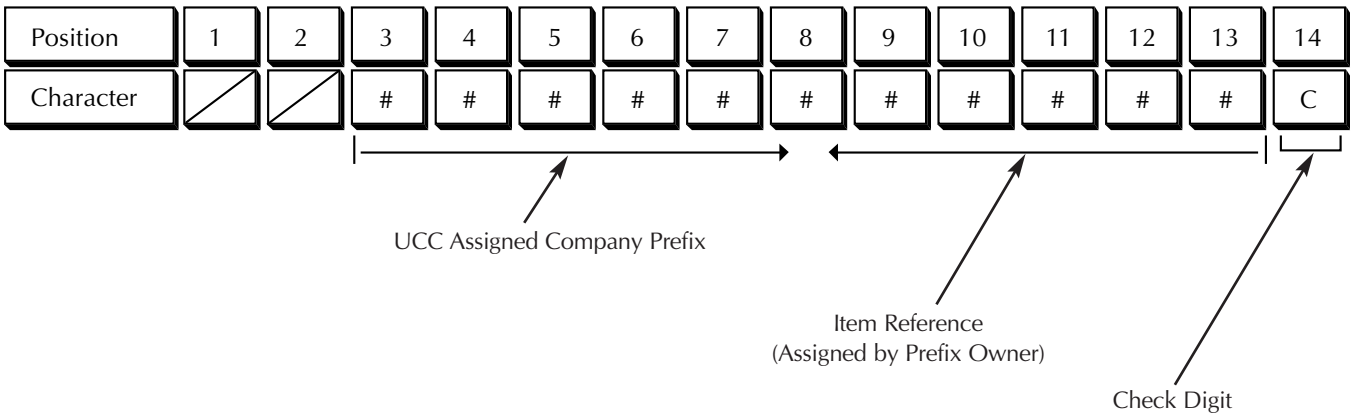
- the GTIN is unique anywhere in the world
- the GTIN is tied to the manufacturer
- there are no duplicate numbers
- no cross-referencing is needed
- no unnecessary database management and maintenance is required
- no misordering or misbilling due to wrong product numbers
- no need to re-sticker products with internal SKU number
- communications are more accurate
- all members of the supply chain can reference the product using the same number

Standard Product Identification at the Package Level

The Global Trade Item Number (GTIN) comprises the UCC-12, EAN/UCC-13, and EAN/UCC-14 ID numbers. A detailed description of each of these ID numbers follows, except EAN/UCC-8. EAN/UCC-8 is used outside of the U. S. A. and Canada to identify small items and thus is not likely to appear in the foodservice industry. **The UCC-12,** administered by the Uniform Code Council (UCC), is the numbering scheme recommended by EFR to be used on all packages for the foodservice industry (the package refers to the units inside the case). We are all accustomed to seeing the UCC-12 number on packaged goods in every grocery store in America. The UCC-12 is a numbering scheme that is unique throughout the world and has been successfully used in multiple industries in North America.

The UCC-12 is a 12-digit number assigned by the manufacturer (or owner of the label) that identifies (1) the *manufacturer of that product,* and (2) the *product number assigned by the manufacturer.* For the needs addressed in this document, we will offer a simplistic view of the UCC-12 structure shown in figure 4.1.

Figure 4.1
The UCC-12 ID Number



** See figure 4.4 for example of UCC-12 encoded in a bar code symbol*

Positions 3-14 above represent the UCC assigned **Company Prefix** and the prefix owner assigned **Item Reference** number. The Company Prefix number was formerly referred to as the "manufacturer ID" or the "manufacturer number."

One of the roles of the UCC is to act as the numbering organization for North America by ensuring that the manufacturer's Company Prefix is unique. It works with other organizations throughout the world (called EAN member organizations) to ensure that this number is truly unique anywhere in the world.

The Item Reference is assigned by the owner of the Company Prefix. It is up to the owner of the Company Prefix to ensure that the Item Reference numbers assigned to its products are unique. It is highly recommended that the assignment method for Item References be overly simplistic with no intelligence to the number. To elaborate, if you start your first product at 1 and increment the number by one for each new product, it will ensure uniqueness and will handle potential problems in the future. If you try and parse the digits into things such as marketing divisions, brands or some other grouping method, you might run out of numbers within that group or could potentially run into a problem when acquiring products from another manufacturer.

A potentially different situation could occur as it relates to identifying private label/proprietary products. If a distributor or operator wishes to sell a private label product manufactured and/or packaged by another party yet having their label, the Company Prefix shown in the GTIN should be theirs and the Item Reference should also be assigned by them. A general rule of thumb is that the owner of the label on the product is the one that should have its Company Prefix and Item Reference number on the product.

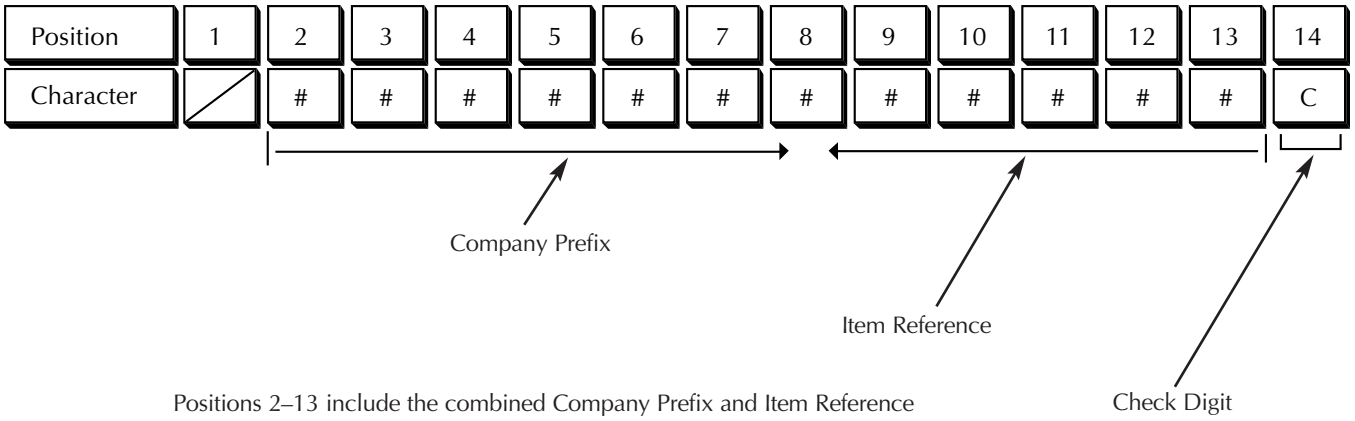
The **Check Digit** (position 14 in figure 4.1) is used to ensure the numbers that precede the Check Digit are indeed the correct numbers. The technical name for this Check Digit is the Modulo 10 check digit. See the ***UCC's Application Standard for Shipping Container Codes*** document or visit the UCC's website at www.uc-council.org to determine how to calculate this digit. The important point to understand is that the Check Digit is part of the UCC-12 and should not be stripped off before storing the number in the database. If you were to do this, you would need to calculate the Check Digit each time you communicate to a trading partner and verify the Check Digit every time you receive a document.

Putting it all together: the UCC Company Prefix, the Item Reference number and the Check Digit give you one unique 12-digit number. The UCC-12 number is used on the product inside the case. Typically it is used for point of sale transactions, not for ordering, billing or shipping

transactions, as the case is usually the unit of measure used for these transactions. The UCC-12 could also be used for inventory tracking of products at the end-user location.

The **EAN/UCC-13** is used in the international community outside the U. S. A. and Canada. It is a 13-digit number. The premise is the same as the UCC-12. It defines (1) who the manufacturer is, (2) what the item reference is, and (3) a check digit (see figure 4.2). Each EAN member organization has a different number of digits that define the Company Prefix.

Figure 4.2
The EAN/UCC-13 ID Number (for International use)



** See figure 4.5 for example of EAN/UCC-13 number encoded in a bar code symbol*

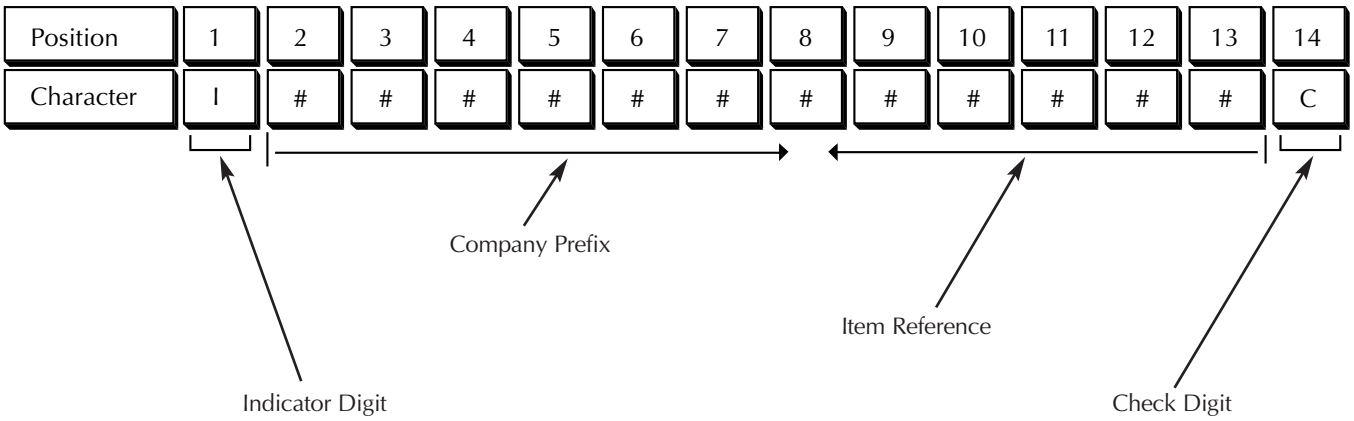
If you are a company that trades internationally, you will see both the UCC-12 digit number as well as the EAN/UCC-13 number. The importance of knowing this is that an operator or distributor's database should be able to store either a 12-digit UCC-12 or a 13-digit EAN/ UCC-13 number. How do you store a 12-digit UCC-12 into a database that is 13 digits long? Simply add a zero to the furthermost left digit and you will still have a unique 13-digit number. The EAN/UCC-13 number is typically found on products inside the case and is used in a point of sale environment, similar to the UCC-12. It is not typically used for ordering, billing and shipping transactions as the case is usually the unit of measure used for these transactions.

Standard Product Identification at the Case Level

The EAN/UCC-14 is a 14-digit number that has been recommended by EFR to serve as the ID number to identify cases in the foodservice industry.

The EAN/UCC-14 is used extensively in the grocery industry and other industries, making it easier for manufacturers in overlapping industries to use the numbering scheme on cases in the foodservice channel as well. As is the case for the UCC-12 and the EAN/UCC-13, the EAN/UCC-14 is a globally unique number. It contains the three basic components found in the UCC-12 and the EAN/UCC-13, but adds an additional component called the **Indicator Digit** (see figure 4.3 below).

Figure 4.3
The EAN/UCC-14 structure



** See figure 5.5 for example of EAN/UCC-14 encoded in a bar code symbol*

The Indicator Digit (position 1 in the previous figure) gives the manufacturer added flexibility to define the level of packaging where:

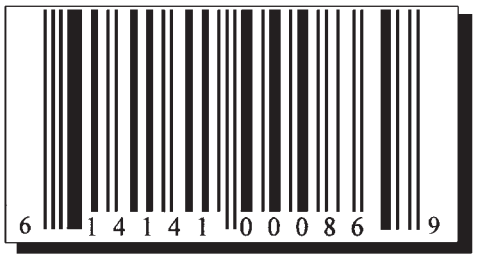
- "0" means the UCC-12 or EAN/UCC-13 of the products contained inside the case have a different item reference from the item reference shown on the EAN/UCC-14 on the outside of the case.
- "1-8" means the item reference on the packages inside the case is the same item reference that is shown on the EAN/UCC-14 on the outside of the case. The manufacturer also has the flexibility to use numbers 1 through 8 to indicate different levels of packaging (case, carton, pallet, bale, etc.) for the product.
- "9" means the contents of the case can vary in weight or quantity from container to container. This number is used to identify random-weight products (discussed later in this chapter) and requires the use of at least one Application Identifier (AI) (also discussed later in this chapter) to indicate the quantity of units inside the case.

Digits 2 through 13 consist of an assigned **Company Prefix** plus the prefix owner's **Item Reference**.

The **check digit** found in position 14 in figure 4.3 is the same Modulo 10 check digit found at the end of the UCC-12.

Figure 4.4
UCC-12 and EAN/UCC-13 Bar Codes

UCC-12



EAN/UCC-13

As the unit of measure used for ordering, billing and shipping is typically the case, the EAN/UCC-14 would be the number used to reference the case for these processes. This includes ordering, pricing, most promotions, invoicing, shipping and receiving processes. In an electronic commerce environment, most of the transactions involving these processes will require the case code (the EAN/UCC-14) when communicating between trading partners, not the UCC-12 or EAN/UCC-13.

In the foodservice industry, the case can be viewed as the package for that product. Because of this scenario, you would need to include the EAN/UCC-14 number for the case in the same field that you would include the UCC-12 or the EAN/UCC-13 for an item.

Expanding your database to include 14 digits will accommodate all scenarios for product identification throughout the world. How do you fit a UCC-12 or an EAN/UCC-13 into a 14-digit database? Simply add two zeros to the furthermost left position of the UCC-12 and add one zero to the furthermost left position of the EAN/UCC-13 and you still have a globally unique number (see figure 4.5). This database expansion allows you to manage all possible scenarios you would encounter in North America and abroad. The UCC, in conjunction with EAN, has published a sunrise date of Jan.1, 2005, urging all industries to expand their databases to handle 14 digits in order to accommodate the UCC-12, EAN/UCC-13 and EAN/UCC-14 numbers worldwide.

It is extremely important to understand that this does NOT mean that manufacturers should begin putting 14 digits onto packages that once had 12 digits for the UCC-12 or 13 digits for the EAN/UCC-13. What it means is that you should be able to *store* the UCC-12 and the EAN/UCC-13 in the same database field as the EAN/UCC-14. The UCC-12 and EAN/UCC-13 will still appear on the *packages* the way they have always appeared.

Figure 4.5
Database Expansion to 14 Digits

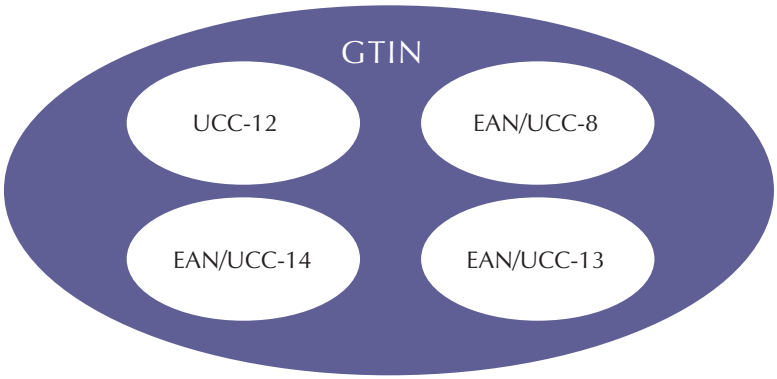
Number	Level	1	2	3	4	5	6	7	8	9	10	11	12	13	14
EAN/UCC-14	CASE	I	#	#	#	#	#	#	#	#	#	#	#	#	C
EAN/UCC-13	ITEM	0	#	#	#	#	#	#	#	#	#	#	#	#	C
UCC-12	ITEM	0	0	#	#	#	#	#	#	#	#	#	#	#	C
EAN/UCC-8	ITEM	0	0	0	0	0	0	#	#	#	#	#	#	#	C

"UCC-12" Add two zeros to positions 1 and 2

"EAN/UCC-13" Add a zero to position 1

"EAN/UCC-8" Add zeros to positions 1 through 6

Figure 4.6
The Global Superset of 14 digits



Because the foodservice industry needs more information at the case level besides the EAN/UCC-14 case number itself, allowances were made to append additional information to the EAN/UCC-14 using **Application Identifiers** (AIs). AIs are supplemental pieces of information used to further characterize the case of product. They are reserved numbers that qualify the information that directly follows these numbers (see Appendix B for a list of AIs). The AIs are separated visually by parentheses; then the information follows the parentheses (see figure 5.8). It is used in addition to, not in lieu of, the GTIN for that case of product. In other words, you must use the EAN/UCC-14 first and follow it with the appropriate AIs to further characterize what is in the case.

Figure 4.7
Example of the EAN/UCC-14 plus an Application Identifier

The product is a case of scallions weighing 10.5 pounds.

The GTIN for scallions is 00123456111113

The AI for net weight in pounds is 3202

The net weight of the case is 10.5

** See figure 5.6 for example of the GTIN plus multiple AIs in a bar code symbol*

When using the EAN/UCC bar code symbol (see chapter 4), you must use AIs to qualify all information that follows. As shown in figure 4.7, the AIs are enclosed in parentheses and then the actual data follows. This is to help you visually differentiate the supplemental information from the primary identification of the product. In a scanning environment, it will also help the scanner to differentiate the information from the primary ID and other supplemental information. It is extremely important to understand that you do NOT store information conveyed by these AIs in your item master database. As information in the AIs can change from case to case (e.g., weight for a random-weight case), it would be impossible to maintain this ever-changing information on that product in your item master database. Therefore, in your database it is necessary only to store the GTIN shown on the case.

Having AIs included in the bar code shown on the case allows the automatic capture of this information once the bar code is scanned. This will prevent the receiver from having to key in this supplemental information for each individual case. A prime example of where AIs are crucial is cases containing perishable items. On these cases it might be necessary to include the expiration date or sell-by date, net weight, quantity, etc.

Standard Identification of the Logistics Unit (the Pallet Level)

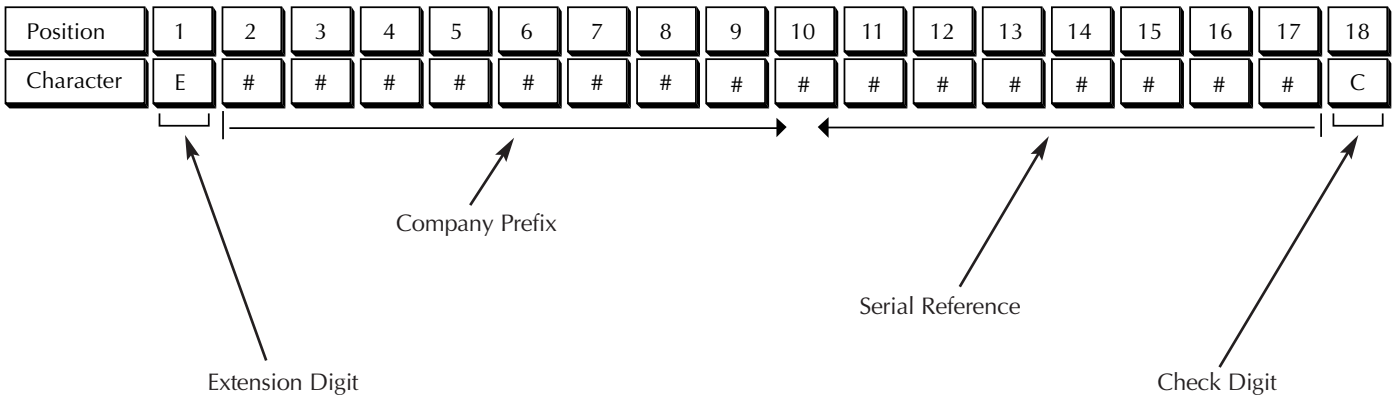
The SSCC (Serial Shipping Container Code) is an 18-digit number that has been recommended by EFR to serve as the ID number used to identify pallets (the most common logistics unit) in conjunction with the EDI Ship Notice Manifest, also known as the Advance Ship Notice (ASN), in the foodservice industry. The SSCC is NOT used as a number to order the pallet, rather it is a number that acts as a unique reference number for identifying a particular pallet. That unique reference number will be used in an EDI or electronic commerce environment to assess which cases and products are contained on that particular pallet. So, for example, you can have two pallets that are identical in content, yet have one SSCC number to reference one of those pallets and a different SSCC to reference the other pallet.

The purpose of the SSCC is to act as a "license plate" for a specific pallet. Because of the bar code symbol that is able to encode this number, the license plate is printed on a label and then affixed to the pallet. This label is often referred to as the "pallet ID tag." The "license plate" number is used in an EDI or electronic commerce environment (via the ASN) as the "key" to unlock information regarding the contents of that pallet. Here is a typical scenario using the SSCC in conjunction with the EDI ASN transaction:

1. The manufacturer assigns an SSCC number to a pallet and encodes the number into a bar code on the pallet.
2. The manufacturer then sends an EDI ASN to the receiving party with the corresponding SSCC number and all of the details of that pallet.
3. The receiving party then receives the ASN via EDI and stores it in their systems.
4. The shipment containing the pallet arrives at the receiving location.
5. The receiving warehouse then scans the SSCC located on the pallet.
6. Their system then searches the database where the EDI information was stored for the SSCC that was just scanned.
7. It finds the SSCC and reveals all of the details for that pallet (# of packages per case, # of cases per layer, # of layers per pallet, UCC-12 package numbers, EAN/UCC-14 case code numbers, etc.).

The warehouse will now be able to automatically receive the pallet without having to manually count the products on it. This process assumes that the receiving warehouse has scanning equipment. It also assumes that the supplier can provide the receiver with an ASN *before* the shipment arrives at the receiving warehouse.

Figure 4.8
The SSCC Structure



** See figure 5.8 for example of SSCC encoded in a bar code symbol*

Position 1 (E in figure 4.8) is the **Extension Digit** (not to be confused with the Indicator Digit part of the EAN/UCC-14 numbering structure). The Extension Digit, in conjunction with the Serial Reference, provides extended numbering capacity for the SSCC. Positions 2-17 are the UCC assigned Company Prefix plus the prefix owner's Serial Reference (this is NOT an item number like you would find on a UCC-12 or an EAN/UCC-14).

Position 18 (C in figure 4.8) is the Modulo 10 Check Digit.

The SSCC can be used in a non-EDI environment as well. One application would be to have the SSCC that is affixed to the pallet act as a license plate for you to internally track inventory while the pallet is still in your warehouse. See the UCC's **Application Standard for Shipping Container Codes** for more information on uses for and locations of the pallet ID tag.

4

Bar Codes

For the purpose of interpretation, **bar codes** refer to the symbols of bars and spaces used to encode numbering schemes and other information. Bar codes are also commonly referred to as "data carriers." As you will recall from our previous discussion of symbols, bar code symbols are the different ways of using bars and spaces that a scanner can read to automatically capture information.

Although there are many different types and orientation of bar codes (linear, two dimensional, radio frequency, etc.), we will focus on linear bar codes as they are the most practical and realistic for the foodservice industry. Better technologies with more applications will eventually emerge.

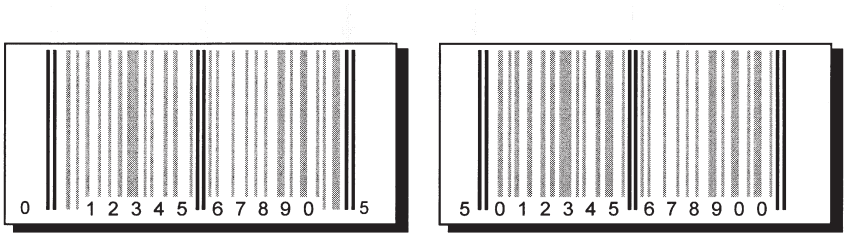
This section will provide you with a cursory understanding of the bar code symbols used at the package, case and pallet levels. For a more detailed description, please refer to the Bar Code Symbol Manuals in Appendix A.

Bar Codes at the Package Level

The UPC-A (more commonly referred to as simply the U.P.C. symbol) is the symbol used to encode the UCC-12 code on the product inside the case. Again, it is important that you differentiate between the symbol (UPC- A) and the ID number (UCC-12). So, for example, it is accurate to say that you would be using a UCC-12 ID number on your packages encoded in the UPC-A symbol.

The UPC-A symbol is a series of 30 bars and 29 spaces that are used to encode the UCC-12. It includes bars and spaces called "guard bar patterns" that simply act as separators of the information and do not contain any data characters (see figure 5.1).

Figure 5.1
Guard Bar Patterns in the UPC-A and EAN-13 Symbols



UPC-A E A N - 13

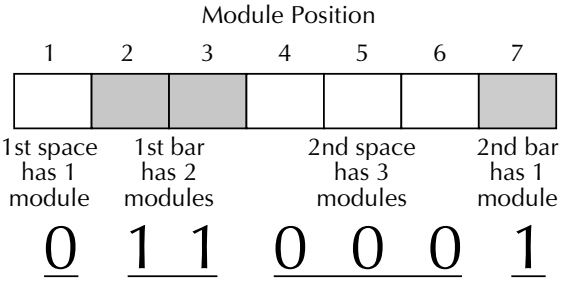
Following is a "readers digest" version of how these bars and spaces are recognized by a scanner. Refer to the UCC document ***Quality Specification for the U.P.C. Symbol*** or the UCC's ***Solution Center*** for more detailed information on how a bar code is read. If you have no need to know how a bar code is read by a scanner, skip to the text just after figure 5.2.

Each number is represented by a "symbol character," which contains 2 bars and 2 spaces. These 2 bars and 2 spaces are spread over 7 modules (see figure 5.2). The scanner reads over these 7 modules and counts the width of each bar and each space over these 7 modules. In figure 5.2, there exist two bars and two spaces within the 7 modules. The first *space* covers 1 module. The first *bar* covers 2 modules. The second *space* covers 3 modules. The second *bar* covers 1 module. Therefore, the pattern the scanner reads from left to right is 1 - 2 - 3 - 1. A blank module is represented by a zero and a dark module is represented by a 1. Therefore the scanner reads a 1 - 2 - 3 - 1 pattern, converts the number of modules that are blank versus those that are dark, ends up with 0110001 (1 zero, 2 ones, 3 zeros, 1 one). It looks this pattern up in a table and equates this pattern to the number 5. The scanner then goes to the next symbol character to read the two bars and two spaces enclosed in the next 7 modules and does the same thing. It continues to do this until it reaches the end of the bar code.

As the EAN/UPC symbol can contain only so much data, it is limited to the UCC-12 and EAN/UCC-13 numbering structures. As these numbering structures are applicable to the package, the EAN/UPC symbol is affixed to the package. The package could have a variety of surfaces from a box to a plastic bag. The important thing to note is that the EAN/UPC symbol is very precise and therefore requires a very clear and precise imprint. If the imprint of the EAN/UPC symbol on the surface of the package is blurred or smudged, the scanner cannot read it. See the UCC document ***Guidelines for Producing Quality Symbols*** or the UCC's ***Solution Center*** for more information.

Figure 5.2
The number 5 represented by Symbol Character Modules

(2 spaces and 2 bars spread over 7 modules)



The pattern 0110001 represents the number 5 in the U.P.C. symbol

The EAN/UCC-13 is encoded in the same symbol (see figure 5.3). Therefore, most scanners that can read a UPC-A symbol can also read the EAN-13 symbol.

Figure 5.3
EAN-13 Bar Code Symbol

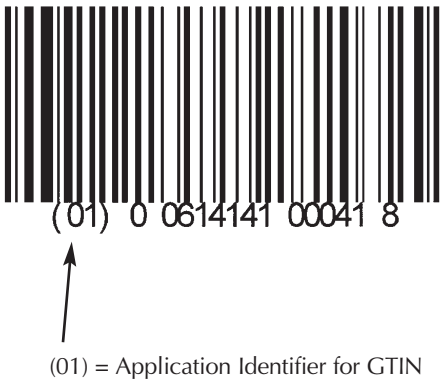
The UPC-A and EAN-13 symbols are constructed from the EAN/UPC symbology, therefore it is correct to refer to these symbols as one symbol, the EAN/UPC (see figure 5.4).

Figure 5.4
EAN/UPC Bar Code Symbols

Bar Codes at the Case Level

There are two common types of symbols that can be used to encode the EAN/UCC-14 case number: the ITF-14 (also referred to as the Interleaved 2 of 5, I 2 of 5 or ITF) and the *UCC/EAN-128* symbol. The ITF-14 symbol, however, cannot encode Application Identifiers (mentioned in Chapter 3 under standard product identification at the case level). The UCC/EAN-128 symbol not only handles the EAN/UCC-14, but up to an additional 34 characters of information via the use of AIs.

Figure 5.5
EAN/UCC-14 Encoded in a UCC/EAN-128 Bar Code Symbol



The UCC/EAN-128 bar code symbol and the ITF-14 symbol should be used for simple case code identification. For fixed-weight items, the ITF-14 bar code symbol can be used. For variable weight items, the UCC/EAN-128 symbol is necessary. When using AIs however, the UCC/EAN-128 bar code symbol must be used to encode the EAN/UCC-14 case code. A warehouse should be able to read the EAN/UCC-14 in both the ITF bar code symbol (when AIs are not used with the EAN/UCC-14) and the UCC/EAN-128 bar code symbol (when AIs are used in conjunction with the EAN/UCC-14).

The UCC/EAN-128 symbol, unlike the ITF-14 and EAN/UPC symbols, provides for numeric, upper and lower case alphabetic, punctuation, special functions, and other control characters.

Because the UCC/EAN-128 symbol allows for multiple pieces of information to be included via AI codes, it is necessary to include an AI code in parentheses, in the human readable information, before conveying

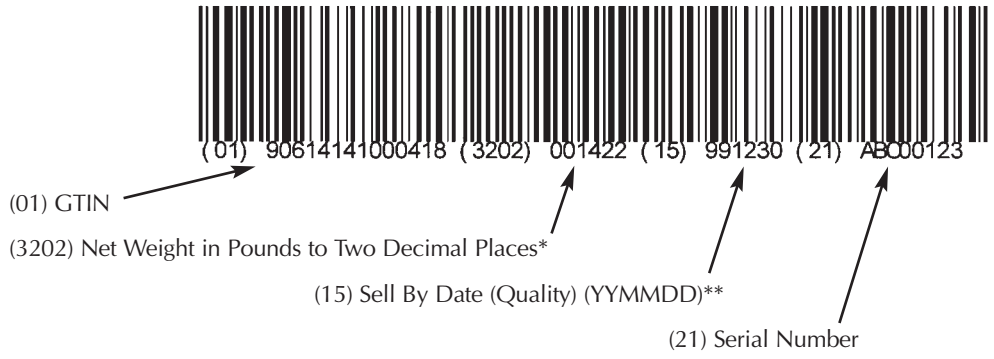
each piece of information used in this symbol. In figure 5.6, AI (01) represents the GTIN that follows, AI (3202) represents the Net Weight in Pounds with the actual weight that follows, etc.

The condensed version of how a scanner reads the UCC/EAN-128 symbol is very similar to how a scanner reads the U.P.C. symbol mentioned earlier in the chapter. The most significant difference is in the number of modules (and therefore the number of bars and spaces) contained in each symbol character. The UCC/EAN-128 symbol has 3 spaces and 3 bars spread over 11 modules to represent one symbol character. As we earlier covered how the scanner reads the symbol, we will not go into the same discussion for the similar UCC/EAN-128 symbol.

As is the case for the EAN/UPC symbols, the UCC/EAN-128 symbol must be printed on a surface that makes the imprint clear and precise. This typically suggests that the symbol be printed on a white label with black ink. This allows the scanner to read a clear, precise symbol with colors that are ideal for a scanner. Direct printing of the UCC/EAN-128 symbol on a corrugated cardboard surface requires a high degree of quality control. For some applications it may be impractical to direct print the UCC/EAN-128 symbol on corrugate as it might make the bar code unscannable. See the UCC document ***Guidelines for Producing Quality Symbols*** or the UCC's ***Solution Center*** for a more detailed discussion of printing these symbols.

Figure 5.6
UCC/EAN-128 Bar Code Symbol

(with EAN/UCC-14 plus Application Identifiers)

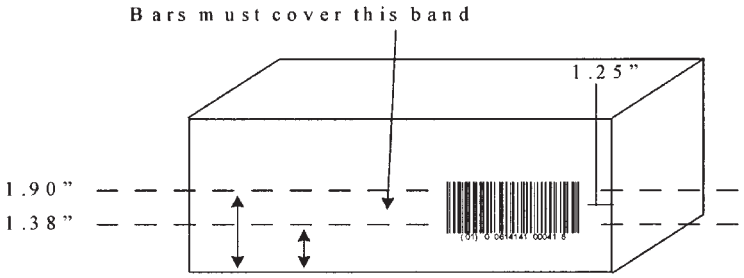


**or AI 310x Net Weight in Kilograms **or AIs 11, 13 or 17 production, packaging, or expiration date*

Location of the EAN/UCC-14 on a Case

The bottom edge of the bar code that contains the EAN/UCC-14 should be located 1.25" +/- 0.125" from the natural bottom of the case. It should appear on two adjacent sides. It is recommended that the outer edge of the bar code be no closer than 1.25" from the vertical face of the container (see figure 5.7).

Figure 5.7
Location of the EAN/UCC-14 data carrier on the case



Bar Codes at the Pallet Level

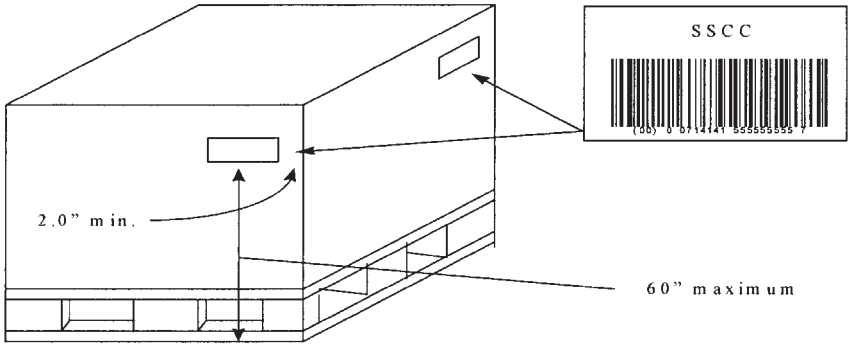
The same bar code symbol used at the case level will also be used at the pallet level: the UCC/EAN-128 bar code symbol. As this symbol holds a total of 48 characters, it is more than enough to contain the SSCC numbering scheme and additional information contained in supplemental Application Identifiers (see figure 5.8). With pallets, the symbol should be printed on a label and the label applied to the pallet. This ensures that the symbol can be scanned.

Figure 5.8
SSCC Encoded in a UCC/EAN-128 Bar Code Symbol

Location of the SSCC on a Pallet

Each pallet should have at least one bar code. It is recommended, however, that a pallet contain an additional bar code on the adjacent side to allow the person scanning the bar code to scan from either side of the pallet (see figure 5.9). This is especially helpful when the pallet is turned sideways in the truck or on the rack in the warehouse. The SSCC should appear on the upper right side of the pallet. For additional information on the location of the SSCC on a pallet or other container, see the UCC document ***Application Standard for Shipping Container Codes***.

Figure 5.9
Location of SSCC data carrier on a pallet



5

How *do* I Begin? What *are the* Next Steps?

You now have a firm understanding as to what numbering schemes are and how these numbers are encoded into bar codes. So what do you do now? Let's start with assigning the number, then let's bar code the number.

We'll divide this section into two perspectives: (1) from the company owning the label, and (2) from the company scanning the bar codes. In both perspectives, we'll assume nothing has been done to identify your products and that you do not have the ability to scan bar coded products.

Next Steps for the Owner of the Label

1. Get a Company Prefix number. If you are a manufacturer/supplier, or you are selling a private label product with your label affixed to the product, you will need to get a Company Prefix. In order to do this, you simply contact the Uniform Code Council's Customer Service Department via phone, Internet or mail at:

Uniform Code Council, Inc.
7887 Washington Village Dr., Suite 300
Dayton, OH 45459
937/435-3870
www.uc-council.org

They will ask you to fill out an application form and pay a one time fee based on the dollar sales of your company. You will receive your Company Prefix, along with the Solution Center containing the various publications mentioned in this document approximately 10-14 days after the UCC receives your completed application.

2. Assign a GTIN to the product or package. Once you have received your Company Prefix, you need to assign an item reference number to each of your products. The selected item reference number will be combined with your Company Prefix and the ending check digit to form the UCC-12 to identify the package. A few suggestions when assigning your numbers:

- make them simple
- start with 1 and simply increment the number by one for the next product
- allow for the possibility of acquiring other products from a merger/acquisition
- refer to the product number, both internally and externally, as the full 12-digit number

- store the GTIN in your database as a 14-digit number (00 + the 12 digit U.P.C. number)

3. Assign an EAN/UCC-14 case code to each case configuration. Once you have assigned a UCC-12 code to the package, you should assign the EAN/UCC-14 to the case. If you have a case that has 10 packages of item A and another case that has 15 packages of the same item A, you should assign one EAN/UCC-14 for the 10-pack case, and a different EAN/UCC-14 for the 15-pack case. Keep in mind that the EAN/UCC-14 number references the *case* of product and the UCC-12 represents the items contained inside the case. For this reason, the UCC-12 number does not have to be the same number as the EAN/UCC-14 number. When the buyer wants to order the 10-pack of item A, they order with the appropriate EAN/UCC-14 for that *case*; if they wish to order the 15-pack of item A, they order with the appropriate EAN/UCC-14 for that case of item A.

4. Communicate to your trading partners the UCC-12 and EAN/UCC-14 numbers for your products. The most efficient method to share this information between trading partners is Electronic Data Interchange (EDI). The EFR Electronic Commerce Committee created a white paper called, "Getting Started in Electronic Commerce: Item, Price and Promotion Transactions," which explains the use of EDI to transmit product information between trading partners. See figure 6.1 for an example of the minimum information that should be communicated, regardless of the method.

5. Store the numbers in your database as 14-digit numbers. Add two zeros to the left side of the 12-digit UCC-12 number and it will fit nicely into the 14-digit field. If you have any EAN/UCC-13 numbers, add a zero to the left side of the 13-digit EAN/UCC number and it too will fit nicely into the 14-digit field. For the EAN/UCC-14, store it without change.

Figure 6.1
Example of EAN/UCC-14 Communication

Case Description	EAN/UCC-14 Case Code	Package Description	UCC-12 Package Code	# of packages
SureGood Flour	10712345112237	SureGood Flour	712345112235	10
SureFine Flour	10712345233562	SureFine Flour	712345233564	10
SureGood/SureFine	00712345935562	SureGood Flour	712345112235	5
		SureFine Flour	712345233564	5

Now that you have the numbers assigned to your packages and cases, you've communicated the codes to your trading partners, and you've ensured that all programs both pulling from and writing to your product databases include the correct number of digits, you are ready to begin bar coding these numbers on your packages, cases and pallets. If a priority were given, the cases should be bar coded first, the packages second and the pallets third. The reason for this priority is that the case is handled much the same way throughout the industry. As the case moves through the supply chain, each member would benefit greatly from scanning a bar code on the case. As the products inside the case do not always need to be scanned, the urgency isn't as great as it is with the actual case of product (this scenario certainly is not true if the product is being sold as an "each" by the distributor and thus requires a bar code on the package of the product, or if an operator is using the UCC-12 package code to automate inventory tracking and replenishment).

6. Decide on one of the two following bar code application methods:

- create the bar code as part of the packaging material (direct print)
- create the bar code on a label to be placed on the product

7. Determine the bar code symbol location for each package.

8. If your printing process requires an image of the bar code symbol (film master, electronic image file, etc.) you will need to supply the individual symbol information (data to encode, x dimension, bar width reduction, etc.) for each image to be generated. Specifications for this process may be found in: ***UCC's Guidelines for Providers of EAN/UPC Symbol Design Software.***

9. Maintain a quality control program to ensure the continuing quality of the printed symbols.

Next Steps for Companies Scanning Bar Codes

1. Identify your application's requirements for data collection and information processing. Contact a vendor who provides integrated scanning and software systems.

- If you are scanning at the warehouse level and will be scanning cases and pallets, be sure the scanner can read both the ITF-14 and the UCC/EAN-128 bar code symbols.

- If you are scanning in the back room at the operator level, be sure the scanner can read EAN/UCC bar code symbols.

2. Ensure that your databases can store a 14 digit GTIN.

3. Allow for some type of tracking process that will allow you to quickly identify a vendor whose printed symbols are not scanning properly.

Appendix A: Reference Material

Standard Product Identification Manuals:

ANSI/UCC6-1996: Application Standard for Shipping Container Codes
(available from the UCC)

U.P.C. Guidelines Manual
(available from the UCC)

ANSI/UCC4-1995: UCC/EAN-128 Application Identifier Standards
(available from the UCC)

Bar Code Symbol Manuals:

ANSI/UCC5-1995: Quality Specification for the U.P.C. Printed Symbol
(available from the UCC)

ANSI/UCC6-1996: Application Standard for Shipping Container Codes
(available from the UCC)

UCC Guidelines for Producing Quality Symbols
(available from the UCC)

Guidelines for Providers of EAN/UPC Symbol Design Software
(available from the UCC)

ANSI/UCC4-1995: UCC/EAN-128 Application Identifier Standard
(available from the UCC)

U.P.C. Symbol Location Guidelines Manual
(available from the UCC)

U.P.C. Film Master Verification Manual
(available from the UCC)

U.P.C. Coupon Code Guidelines Manual
(available from the UCC)

ANSI/UCC1-1995: U.P.C. Symbol Specification Manual
(available from the UCC)

ANSI X3.182-1990 Bar Code Print Quality Guideline
(available from AIM USA)

ANSI/AIM-BC-4-1995: Uniform Symbol Specification—Code 128
(available from AIM USA)

UCC
Uniform Code Council Customer Service
7887 Washington Village Dr., Suite 300
Dayton, OH 45459
www.uc-council.org
937/435-3870
937/435-7317 (fax)

AIM USA
Automatic Identification Manufacturers
634 Alpha Drive
Pittsburgh, PA 15238
www.aimusa.org
412/963-8588
412/963-8753 (fax)

Appendix B: Application Identifiers

Voluntary Application Identifier Guidelines for the Foodservice Industry

Background

Operators, distributors and manufacturers are realizing the benefits of case level bar coding and beginning to make the necessary investment in labeling and scanning technology. As a result, companies are grasping the importance of electronically capturing information about the product in addition to the label owner and item number data supplied on a standard bar code. This supplemental information, coded in the UCC/EAN-128 symbology through the use of Application Identifiers (AIs), is increasingly viewed as important by many operators and distributors. In order to facilitate the cost-effective adoption of AIs by foodservice manufacturers, the EFR Bar Code Implementation Work Group has drafted these *voluntary* guidelines for use by any company wishing to code supplemental information through the use of Application Identifiers.

These Application Identifier guidelines:

- identify minimum data requirements as defined by operators, distributors and manufacturers;
- include only dynamic information that cannot be easily shared and referenced in a database; and
- were developed for adoption by any company packaging foodservice product(s) for sale.

It must be noted that Application Identifiers can only be used with the UCC/EAN-128 symbology. The UCC/EAN-128 is capable of encoding a maximum of 48 characters, which includes the AI codes. Given these inherent character limitations, when faced with space constraints, companies must choose which Application Identifiers are most important for their particular products, customers and corporate objectives.

When creating these guidelines, the EFR work group took into account operator, distributor and manufacturer perspectives. Food safety, and the ability to effectively trace and recall product was a guiding factor in the development of these guidelines.

Voluntary Industry Guidelines

AI	Full Title	Format	Data Title
01	Global Trade Item Number	n2+n14	GTIN
11[1]	Production Date (YYMMDD)	n2+n6	PROD DATE
10[2]	Batch or Lot Number	n2+an..20	BATCH/LOT

(1) When only year and month are required, DD must be filled with "00"

(2) The Lot Number AI format should be generated by the manufacturer of the product for maximum traceability purposes and could include information such as production facility, date, time, line number, etc.) If a company has multiple manufacturing facilities, the lot number should include a unique plant identifier.

The *Format* indicates the data structure of any given AI. For example, AI 11 is represented by an n2+n6 data structure. The n2 means there are two characters necessary to denote that AI 11 is being used. The n6 denotes that there are six characters used to display the actual production date (YYMMDD).

Additions/Exceptions to the recommended minimum Application Identifiers:

- AI 320 (Net Weight, Pounds) should be used when the product is variable in weight.

- In place of AI 11 (Production Date), AI 13 (Packaging Date) can be used for those products requiring additional "stages" of processing (e.g.- freezing or canning, etc.). AI 15 (Minimum Durability Date) and AI 17 (Maximum Durability Date) can also be used in place of AI 11 to satisfy specific customer requests.

- AI 414 (Global Location Number — identification of a physical location) should be used when an operator or distributor is procuring proprietary product from multiple sources but requesting the operator/ distributors Company Prefix be used. This will assure that product can be effectively traced to its source. (The same result could be achieved by having the multiple suppliers of the same product create different item numbers. Both of these methods create differentiation and assure maximum traceability.)

- Where appropriate, a supplier might also choose to include AI 21 (Serial Number) in place of a lot number.

Note: For an operator or distributor of proprietary labeled products where the operator or distributor company prefix is being used, steps should be taken, through the manufacturer, to assure lot *number* uniqueness.

Below is an example of a bar code with application identifiers. **AI (01) 12345678901231** denotes the GTIN; **AI (11) 050815** signifies a production date of August 15, 2005; **AI (3202) 000500** denotes a net weight of 5.00 pounds; and **AI (10) ABC123DEF** denotes the batch/lot number.

Example: GTIN with Application Identifiers

AI #	Content	Format
00	SSCC	n2+n18
01	Global Trade Item Number	n2+n14
02	GTIN of Trade Items Contained in a Logistics Unit	n14
10	Batch or Lot Number	n2+an..20
11 (*)	Production Date	n2+n6
13 (*)	Packaging Date (YYMMDD)	n2+n6
15 (*)	Sell By Date (Quality) (YYMMDD)	n2+n6
17 (*)	Expiration Date (Safety) (YYMMDD)	n2+n6
20	Product Variant	n2+n2
21	Serial Number	n2+an..20
22	Quantity, Date, Batch and Link	n2+an..29
23 (**)	Lot Number (Transitional Use)	n3+n..19
240	Additional Product Identification Assigned by the Manufacturer	n3+an..30
250	Secondary Serial Number	n3+an..30
30	Quantity	n2+n..8
310 (***)	Net Weight, Kilograms	n4+n6
311 (***)	Length or 1st Dimension, Meters	n4+n6
312 (***)	Width, Diameter or 2nd Dimension, Meters	n4+n6
313 (***)	Depth, Thickness, Height or 3rd Dimension, Meters	n4+n6
314 (***)	Area, Square Meters	n4+n6
315 (***)	Volume, Liters	n4+n6
316 (***)	Volume, Cubic	n4+n6
320 (***)	Net Weight, Pounds	n4+n6
321 (***)	Length or 1st Dimension, Inches	n4+n6
322 (***)	Length or 1st Dimension, Feet	n4+n6
323 (***)	Length or 1st Dimension, Yards	n4+n6
324 (***)	Width, Diameter, or 2nd Dimension, Inches	n4+n6
325 (***)	Width, Diameter, or 2nd Dimension, Feet	n4+n6
326 (***)	Width, Diameter, or 2nd Dimension, Yards	n4+n6
327 (***)	Depth, Thickness, Height or 3rd Dimension, Inches	n4+n6
328 (***)	Depth, Thickness, Height or 3rd Dimension, Feet	n4+n6
329 (***)	Depth, Thickness, Height or 3rd Dimension, Yards	n4+n6
330 (***)	Gross Weight, Kilograms	n4+n6
331 (***)	Length or 1st Dimension, Meters, Logistics	n4+n6
332 (***)	Width, Diameter or 2nd Dimension, Meters, Logistics	n4+n6
333 (***)	Depth, Thickness, Height or 3rd Dimension, Meters, Logistics	n4+n6
334 (***)	Area, Square Meters, Logistics	n4+n6
335 (***)	Gross Volume, Liters	n4+n6
336 (***)	Gross Volume, Cubic Meters	n4+n6
340 (***)	Gross Weight, Pounds	n4+n6
341 (***)	Length or 1st Dimension, Inches, Logistics	n4+n6
342 (***)	Length or 1st Dimension, Feet, Logistics	n4+n6
343 (***)	Length or 1st Dimension, Yards, Logistics	n4+n6
344 (***)	Width, Diameter or 2nd Dimension, Inches, Logistics	n4+n6
345 (***)	Width, Diameter or 2nd Dimension, Feet, Logistics	n4+n6
346 (***)	Width, Diameter or 2nd Dimension, Yards, Logistics	n4+n6
347 (***)	Depth, Thickness, Height or 3rd Dimension, Inches, Logistics	n4+n6
348 (***)	Depth, Thickness, Height or 3rd Dimension, Feet, Logistics	n4+n6
349 (***)	Depth, Thickness, Height or 3rd Dimension, Yards, Logistics	n4+n6
350 (***)	Area, Square Inches	n4+n6
351 (***)	Area, Square Feet	n4+n6
352 (***)	Area, Square Yards	n4+n6
353 (***)	Area, Square Inches, Logistics	n4+n6
354 (***)	Area, Square Feet, Logistics	n4+n6
355 (***)	Area, Square Yards, Logistics	n4+n6

AI #	Content	Format
356 (***)	Net Weight, Troy Ounce	n4+n6
360 (***)	Volume, Quarts	n4+n6
361 (***)	Volume, Gallons	n4+n6
362 (***)	Gross Volume, Quarts	n4+n6
363 (***)	Gross Volume, Gallons	n4+n6
364 (***)	Volume, Cubic Inches	n4+n6
365 (***)	Volume, Cubic Feet	n4+n6
366 (***)	Volume, Cubic Yards	n4+n6
367 (***)	Gross Volume, Cubic Inches	n4+n6
368 (***)	Gross Volume, Cubic Feet	n4+n6
369 (***)	Gross Volume, Cubic Yards	n4+n6
37	Quantity of Units Contained (For Use With AI 02 Only)	n..8
400	Customer's Purchase Order Number	n3+an..30
410	Ship To (Deliver To) Location Code Using EAN-13	n3+n13
411	Bill To (Invoice To) Location Code Using EAN-13	n3+n13
412	Purchase From (Location Code of Party from Whom Goods are Purchased)	n3+n13
414	EAN Location Code for Physical Identification	n3+n13
420	Ship To (Deliver To) Postal Code Within a Single Postal Authority	n3+an..9
421	Ship To (Deliver To) Postal Code With 3-Digit ISO Country Code Prefix	n3+n3+an..9
8001	Roll products - Width, Length, Core Diameter, Direction and Splices	n4+n14
8002	Electronic Serial Number for Cellular Mobile Telephones	n4+an..20
8003	UPC/EAN Number and Serial Number of Returnable Asset	n4+n14+an..16
8004	UCC/EAN Serial Identification	an..30
8005	Identifies the Price Per Unit of Measure	n6
8100	Coupon Extended Code - Number System Character and Offer	n4+n1+n5
8101	Coupon Extended Code - Number System Character, Offer, and End of Offer	n4+n1+n5+n4
8102	Coupon Extended Code - Number System Character preceded by zero	n4+n1+n1
90	Mutually Agreed, Between Trading Partners (North American pointer to FACT Data Identifiers)	n2+an..30
91	Intra-Company (Internal)	n2+an..30
92	Intra-Company (Internal)	n2+an..30
93	Intra-Company (Internal)	n2+an..30
94	Intra-Company (Internal)	n2+an..30
95	Internal-Carriers	n2+an..30
96	Internal-Carriers	n2+an..30
97	Intra-Company (Internal)	n2+an..30
98	Intra-Company (Internal)	n2+an..30
99	Internal	n2+an..30

(*): To indicate only year and month, DD must be filled with "00"
(**) : Plus one digit for length indication
(***): Plus one digit for decimal point indication

Data Value Representation:

a	alphabetic characters	an3	3 alphanumeric characters, fixed length
n	numeric characters	a..3	up to 3 alphabetic characters
an	alphanumeric characters	n..3	up to 3 numeric characters
a3	3 alphabetic characters, fixed length	an..3	up to 3 alphanumeric
n3	3 numeric characters, fixed length		

For a complete definition of AIs and the most current listing, refer to the UCC Solution Center.

Appendix C: Glossary of Terms

advance ship notice (ASN)—see ship notice/manifest

application identifier (AI)—a number used to represent supplemental information found in the UCC/EAN-128 bar code symbol. These AIís are generally used as secondary codes to provide information not included in standard GTIN numbering, such as product dates, weights and lot/batch numbers.

bar code—a combination of bars and spaces that communicate data about the product or shipping container to which it is affixed. An electronic scanner can read the data elements.

check digit—the number found at the end of many ID numbers. This is a common method used to ensure the numbers that precede the check digit are indeed the correct numbers.

EAN/UCC-13—the ID number primarily used by the international community for individual item identification

EAN International—the numbering organization for the international community outside of North America. The UCC acts as the numbering organization for North America, as the ECCC (see below) does for Canada.

EAN/UPC—the combined EAN-13, EAN-8, UPC-A and UPC-E bar code symbols

Electronic Commerce Council of Canada (ECCC)—the numbering organization for Canada

electronic data interchange (EDI)—the computer-to-computer transmission of business information between trading partners in an industry-wide standard format

extension digit—found in the SSCC numbering scheme

fixed-weight—items that are packaged with a constant weight that does not vary

GTIN—shorthand term for the EAN/UCC Global Trade Item Number. A GTIN may use the EAN/UCC-8, UCC-12, EAN/UCC-13 or EAN/UCC-14 data structure.

guard bars—the bars and spaces on a U.P.C. bar code symbol that helps separate the different components of the number found inside the bar code

Interleaved 2 of 5 (ITF or I 2 of 5)—one of many bar code symbols primarily used at the case level

Integrated EDI—a term applied to the direct entry of information received electronically into the recipient's computer system

item reference—the number and composition of digits used to identify a product or logistic unit

indicator digit—found in the EAN/UCC-14 numbering scheme, it can be used to identify what level of packaging is being identified and whether the items inside the container all have the same UCC-12 number

packager code—used with the Random Weight UCC-12 to identify who packaged the item

random weight—items that are not fixed in weight and vary from package to package or case to case

Serial Shipping Container Code (SSCC)—an ID number that is 18 digits in length that uniquely identifies logistics units, such as pallets

ship notice/manifest—an EDI transaction in which the shipper advises the customer of a pending shipment. Generically this is known as advance ship notice (or ASN). The ASN enables the customer to identify short shipments before receipt and plan warehouse receiving more efficiently.

standard product identification—the numbering scheme used to uniquely identify a product that can be referenced by participants throughout the supply chain

supply chain—the accumulation of all legs of the product supply process, including the procurement of raw materials, the manufacture of goods, the distribution of product and the delivery to the end customer

UCC/EAN-128 (formerly known as UCC-128)—a bar code symbology and data format used for primary and secondary product identification

Uniform Code Council, Inc. (UCC)—the nonprofit standards development organization that helps create standards for supply chain management practices for multiple industries in the U.S.

Universal Product Code (UCC-12)—a numbering and bar coding system for product identification of consumer items, typically scanned at the retail point-of-sale

UPC- A—the bar code symbol used to encode the UCC-12 number