

**STANDARD  
PRODUCT ID  
AND BAR  
CODING:  
FOODSERVICE  
CASE STUDIES  
AND  
PRACTICAL  
APPLICATIONS**



**EFR**

Efficient  
Foodservice Response





**Efficient  
Foodservice Response**

# **STANDARD PRODUCT ID AND BAR CODING: FOODSERVICE CASE STUDIES AND PRACTICAL APPLICATIONS**

*Efficient Foodservice Response*

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**April 2000**

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## **OTHER 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)**

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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 Corporation in Buffalo, N.Y., 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 made 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 those in the grocery industry and that the foodservice industry would require its own economic case for action. The motives for launching 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 costs in the mid-1980s had given 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 mid-1990s 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 displayed 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.

## ***About Efficient Foodservice Response***

- Poor penetration of modern supply chain practices and information technologies that 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 because it possesses a core competency in supply chain management consulting and had helped develop ECR. CSC proposed a collaborative effort with the Stanford Supply Chain Forum at Stanford University, which has a record of bringing academic credibility, objectivity and relevant research into supply chain economics and modeling.

The EFR study shows that 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 may be summed up as a philosophy that can be shared by all supply chain participants. If all supply chain segments meet the primary objective — eliminating costs that do not add value to the consumer — EFR 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 flows 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* — This is the biggest EFR initiative in terms of quantifiable 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, product maintenance EDI (electronic data interchange), revenue cycle EDI, electronic funds transfer and invoiceless payment. An initiative originally identified as part of supply chain demand forecasting — common product information databases — is also being addressed by electronic commerce.

*Logistics Optimization* — This strategy aims to optimize 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.

The five EFR strategies are designed to create a more effective end-to-end supply chain. Only a view of the supply chain as a whole machine will create a truly effective supply chain that optimizes the 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.

Striving to improve business processes presents companies in the foodservice industry with a unique opportunity to become stronger. The Efficient Foodservice Response project provides important analytical tools to help our industry prepare for a tougher business environment.

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.

The Efficient Foodservice Response Executive Committee wishes to express its appreciation for the significant commitment and contributions of the companies profiled in this publication.

## **Acknowledgments**

ARAMARK Corporation

Maines Paper & Food Service, Inc.

Quality Foods, Inc.

Rich Products Corporation

Rosemont Suites

SYSCO Corporation

Taco Cabana

Tyson Foods, Inc.

The Efficient Foodservice Response Executive Committee also extends our sincere appreciation to Karen J. Ribler of KJR Consulting and Charles R. Troyer of CSC Consulting for compiling these “real world” case studies.



The foodservice community could lay claim to potential savings of \$2.96 billion through the Supply Chain Demand Forecasting strategies. Of that amount, over \$847 million a year could be saved if the foodservice supply chain employed voluntary standardized product identification and bar coding for its products.

These figures were presented to the industry in two publications, *Enabling Profitable Growth in the Food-Prepared-Away-From-Home Industry* (1997) and *Standard Product Identification and Bar Codes: The Cornerstones of EFR* (1998).

It was further noted that of the annual \$847 million savings opportunity, the foodservice distributor could realize 55 percent of the savings, manufacturers 18 percent and operators 27 percent.

The above-mentioned documents underscore the potential and carefully articulate the opportunity. Both provide arguments to assist organizations in making the decision to go forward with implementation. *Standard Product Identification and Bar Codes: The Cornerstones of EFR* provides guidance on how to get started with Standard Product Identifiers and bar codes to enhance the distribution chain.

## ***Introduction***



## *Executive Summary*

Based on recent surveys conducted by the EFR initiative, it appears that there is positive movement among all segments of the foodservice supply chain to implement voluntary standard product identification and bar coding. With undisputed evidence that these practices are good business, one wonders why more members of the supply chain have not embraced them. We must also consider what motivating factors would achieve 100 percent usage in the foodservice community.

In the quest to obtain a better understanding of the motivating factors, the EFR Supply Chain Demand Forecasting Committee initiated a series of case studies. Two suppliers, three distributors and three operators were interviewed. The results of those interviews are presented in this report.

In brief, those companies interviewed listed anticipated savings, better business relations, and more efficiency for their internal operations as incentives for moving ahead. The interviews confirmed information that was apparent in recent EFR surveys, that the foodservice community is in the process of moving ahead with standard product identification and bar coding. The answer to “Why move ahead when a limited portion of the industry has made standard product identification and UCC compliant bar codes available?” can be summed up in two phrases – anticipated business advantage in the short term and a strong belief that this is the industry’s long-term future.

Even with the challenge of operating in a business environment that does not offer 100 percent usage, those interviewed reported efficiencies, reduced errors and measurable savings that resulted in improvements to the organizations’ bottom lines. Our interviews found these organizations attributed better communication and seamless business transactions to their use of bar coding. Advantages were reported internally as well as externally in the management of day-to-day business.

It was also noted in the supplier interviews that food safety issues provide a strong motivating factor for implementation. The ability to locate and withdraw product swiftly was highly valued both in terms of consumer safety and protecting the brand/manufacturer name.

A finding that was unexpected but makes a great deal of sense is that bar codes enhance a company’s ability to receive, put away, and pick the correct product even if some employees have difficulty reading English. Scanning a bar code takes the guesswork out of product identification.

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It is also significant that many of the organizations invested their resources in creating systems to take advantage of scanner technology. Some implementations were totally internal, which brought the organization a degree of efficiency that only heightened its desire for an overall supply chain solution. Some organizations put into place parallel systems using UCC product identification guidelines and their own internal item number, as needed, with the vision that the industry will, in the near future, operate using standard product identification and UCC compliant bar codes.

These organizations have set up their systems so that they will be able to accept 14 digit data fields in preparation for a time when the cases going through the system will carry a 14-digit bar code. The knowledge that scanner technology offers efficiencies, savings, tracking information and an easier way to conduct business spurred these organizations on.

It is our hope that the pages that follow will assist you in moving ahead with your organization's use of voluntary standard product identification and UCC compliant bar codes. To that end we begin our text with a brief overview of UCC compliant bar codes, then move ahead with the case studies by industry segment. Finally, we provide in the appendices a vision of a recommended implementation plan with helpful checklists to get your organization on the road to savings.

*Standard Product  
Identification and  
Bar Coding*



In 1998 the EFR Supply Chain Demand Forecasting Committee published *Standard Product Identification and Bar Codes: The Cornerstones of EFR*. This publication identified an annual \$847 million savings opportunity for the foodservice community if voluntary standard product identification and UCC compliant bar codes were employed in the day-to-day management of the supply chain. Further, the publication noted that of the \$847 million potential savings, distributors would realize 55 percent, operators 27 percent and manufacturers 18 percent.

Those numbers are impressive, but the question remains: How do you get there? And if a company decides to move ahead, given the present state of the industry's use of standardized product identification and bar codes, will there be enough "there" to make the investment worthwhile in the short run?

This report is designed to assist the reader in thinking through how to "get there" and in evaluating the motivations drawing the industry forward in a less than perfect world. Here is how we have organized the text:

Since our interviews revealed that a limited percentage of product in the foodservice pipeline currently carries standard product identification and UCC compliant bar codes, **Chapter 2** will address the reasons for the other 60 percent to follow suit.

**Chapter 3** will explore what your organization needs to know to get started, including an overview of the language of bar codes.

**Chapters 4, 5 and 6** are case studies of manufacturers, distributors and operators that use bar coding or are positioning themselves to do so. These chapters underscore the reasons these organizations elected to move ahead, the challenges they face and the rewards they enjoy.

The **Appendices** offer two essays (Supplier and Distributor) that paint a "perfect" world of bar code use. Each essay includes a thorough discussion of the motivation for each fictional company to get started, implementation steps taken, methods used to move ahead realistically when UCC compliant bar codes are not yet in wide use and the resulting fruits of their labor. Another Appendix offers a glossary of terms.

Part of the industry is clearly eager to move forward. The case studies tell of organizations that have moved forward without the availability of a standard product ID. They have put into place bar code systems that have the correct number of digits; in effect, they are following UCC guidelines without having a UCC compliant bar code. Thus, they must make up a product number and put a label on the case.

For many companies this is *not* their vision of the future, and they are making it known that they think other companies are holding back the industry. The opportunity to increase efficiencies is too great for us not to listen to these progressive companies, as you will see in the next chapter.

*Why Foodservice  
Products Should  
Carry Bar Codes*



The argument for industry use of voluntary standard product identification and UCC compliant bar codes may boil down to **money** (a potential savings of over \$847 million annually), **productivity** (elimination of customer specific databases and re-keying of numbers) and **consumer safety** (ability to quickly locate and recall product if necessary).

If standard product identification and UCC compliant bar codes were in use:

- All members of the supply chain could reference the product using the same number.
- The product number would be unique anywhere in the world.
- The product number would be tied to the producer.
- Duplicate numbers would not exist.
- Suppliers and distributors would be relieved of cross-referencing databases.
- Unnecessary database management and maintenance would be eliminated.
- Misordering or misbilling due to wrong numbers would be a thing of the past.
- There would be no need to re-sticker product with an internal SKU number.
- Product distribution would be easier – easier to receive, easier to put away in the right slot, easier to pick, easier to ship.
- Timely communication regarding product movement would be enhanced.
- The ability to speedily recall a product with precision would be the norm.
- Supply chain members would communicate more accurately.
- The language on the box would not limit the readability of the label.
- Once the product was scanned, the information would be in the system.

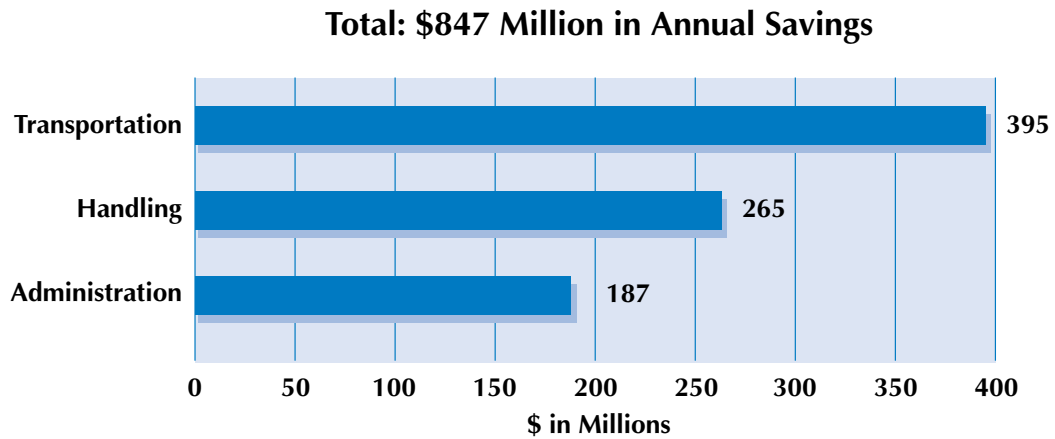
Streamlining transportation, administration and product handling indeed makes good sense.

If standard product identification and UCC compliant bar codes were a reality, there would be:

- No manual reading
- No keying errors
- No stickers
- No excess handling.

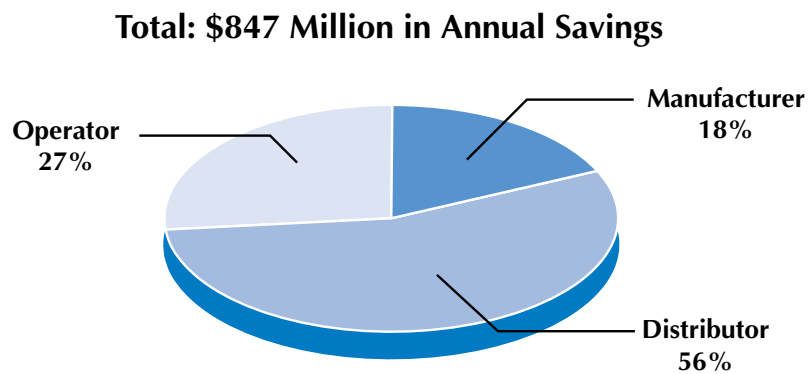
Figures 1 and 2 break down the potential savings by function and by segment.

**Figure 1**  
*Standard Product ID & Bar Codes – Savings by Area*



Source: *Enabling Growth in the Food-Prepared-Away-From-Home Industry* (1977)

**Figure 2**  
*Standard Product ID & Bar Codes – Savings by Segment*



Source: *Enabling Growth in the Food-Prepared-Away-From-Home Industry* (1977)

*What You Need to  
Know to Get Started:  
Understanding the  
Bar Code Language*



Bar coding may appear confusing at first. It has two distinct aspects: language standards and messaging standards.

The information captured in a bar code is conveyed in a language that is referred to as a symbology. This is what most people mean when they say bar code.

The three languages most associated with bar coding in the U.S. food industry are:

- Universal Product Code (U.P.C.)
- Interleaved 2 of 5 (I 2/5)
- UCC/EAN-128 Code

All three of these languages are widely used in conveying product and case information. The UCC/EAN-128 is also associated with conveying pallet information. The EFR publication *Standard Product Identification and Bar Codes: The Cornerstones of EFR* provides an excellent discussion of how each of these languages is used.

Messaging standards govern the construction of the bar code, the “digits” that contain the data encoded in the bar code language. The messaging standards (or numbering scheme) are the number and composition of digits used to identify the product, which can be a package, case, pallet or some other unit.

The Uniform Code Council maintains a voluntary structure for product identification. This structure varies with the informational requirements for various products. The number of digits, the placement of spaces, and their use have evolved based on committee work regarding the industry’s identification needs. “Standard product identification” refers to these existing public standards that are provided by the UCC. Further, the use of standard product identification allows the industry to have a single numbering scheme to uniquely identify a product throughout the supply chain.

There is a common misunderstanding that the UCC creates a number for every product in the industry. This is not the case. Instead, the UCC:

- Provides the industry with an agreed-upon numbering scheme for product identification
- Assigns each manufacturer who requests it a unique UCC Company Prefix number as part of that company’s membership in the UCC.

The manufacturer, using its UCC obtained ID , then assigns each individual product its own number. This numbering scheme provides each product with its own, unique number that can be used throughout the supply chain by all parties to identify a product.

Simply put, individual packages are identified by a 12-digit number (the U.P.C. in the United States) and a 13-digit EAN-13 number in the international community. Products manufactured in North America may use the U.P.C. at the item level anywhere in the world. Cases, on the other hand, are identified by a 14-digit number referred to as the GTIN (Global Trade Item Number) or EAN/UCC-14.

The product identification number can be supplemented with other information through the use of “application identifiers,” or AI’s used with the UCC/EAN-128 symbology. The use of Application Identifiers permit additional information to be encoded in an additional symbol(s) or concentrated with the primary symbol. Multiple Application Identifiers may be used to encode different information about the item. It is merely additional information that may be useful and is human readable.

The scanner “reads” the unique product identification with its AI’s and “understands” the additional information conveyed by the AI. This information may be net weight in pounds, for example, or product date, or lot or batch numbers.

Standardized pallet identification follows an 18-digit numbering scheme. This identifier serves as a unique reference number for pallets. Two pallets carrying exactly the same contents will each have their own, unique number. This is referred to as a “license plate” or “pallet ID tag.”

Again, for an in-depth discussion of messaging standards and standard product identification, the reader is referred to *Standard Product Identification and Bar Codes: The Cornerstones of EFR*.

The main point of this chapter is that agreed-upon guidelines (i.e., standards) are in place that allow all foodservice products to flow through the industry pipeline with one, unique number that can be used by all parties for product identification. Therefore, the industry, today, can reap the benefits of a well-thought-out, thorough, proven product identification system.

# Manufacturer Case Studies

*The following two case studies explain the motivation behind, use of and benefits of bar codes. They also tell where these highly progressive companies stand today in their implementation projects, and what advice they would offer other companies.*



## ***Rich Products Corporation***

*“Rich Products recognizes the importance of bar codes and standard product ID to the foodservice industry. We have taken a leadership position to provide value to our customers, as well as move the industry forward in the voluntary use of bar codes and standard product identification.”*

Kevin Malchoff, Executive Vice President, Sales and Marketing

### **Motivation**

In early 1995 Rich Products made a decision to have all finished goods bar coded when they left any of the company’s plants. The decision was motivated by three factors:

The company recognized that bar codes are the key ingredient in achieving EFR efficiencies, and if the industry is going to enjoy the benefits of EFR, all manufacturers must bar code their finished goods.

The company wanted to enjoy the internal cost savings associated with bar coding.

Some customers requested that Rich’s use bar codes; thus, it was necessary to maintain existing business.

### **Benefits**

The use of bar codes raised Rich Products’ inventory accuracy rate to 99 percent. In addition, the company enjoys the efficiencies that come with a scannable inventory: Taking inventory is swift and not burdensome. Combining the bar code implementation with new printing capabilities has led to savings of well over \$250,000, driven by lower labor costs and less physical inventory.

Product recall drills have demonstrated that the organization has at its fingertips information on each case that was manufactured. Information includes: when it was manufactured, where it went, the trucks that transported it, the bill of lading and the product’s present location. This in turn is comforting knowledge if a quick response was ever needed to recall product.

## Where They Are Today

Rich Products cases use the EAN/UCC-14 encoded in the Interleaved 2-of-5 bar code language in all production plants (bakery, non-dairy and specialty). Adhering to UCC standards, the bar code appears on two adjacent sides of each case.

The SSCC pallet code is not in use at this time. The company does little direct-ship, and the few customers who do receive direct shipments have displayed little interest in standardized pallet coding.

In compliance with UCC guidelines, Rich Products creates special labeling at a customer's request. For example, it can highlight a customer's need to note an expiration date that reflects a six-month period from the time it was refrigerated rather than the time it came off the production line in its frozen state.

## How They Got There

Once the decision had been made to implement bar coding throughout the organization, a champion for the project was appointed and a cross-functional team was put into place. The team was composed of 15 people from: Information systems, operations, packaging and the plants, as well as representatives from Efficient Foodservice Response (EFR). They met for 12-15 months. The first system was tested in October 1996.

Initially the group focused on three basic questions:

- What are industry best practices on bar coding?
- What is Rich Products currently doing?
- What are the gaps between industry best practices and Rich's current practices, and what would it take (project and cost) to move the organization into an industry best practices mode?

To address the first question, the team sought out helpful information from the Uniform Code Council (UCC) and Grocery Manufacturers of America (GMA). It took its guiding principles from the publication *Case Markings: A Common Language for Shipping Containers*, which has been endorsed by virtually every major food industry organization, including the Food Marketing Institute, GMA, Food Distributors International, and dairy and meat groups.

Moving on to the second and third questions, the Rich Products team incorporated information supplied by team members, the UCC and GMA. This resulted in a 30-page report that outlined recommendations to move forward with full bar coding. It said the GTIN (Global Trade Item Number) encoded with the Interleaved 2-of-5 (ITF-14) was the application most suited to the company's case code needs because:

- The I2/5 was easier to use and less expensive to initiate than the UCC/EAN-128 bar code.
- The I2/5 could be read in a relatively dim freezer environment.
- The I2/5 bar code could be printed directly onto kraft corrugate and still be scannable, but the UCC/EAN-128 has not been consistently scannable when printed directly on corrugate.

The recommendations took into account that Rich Products produced mostly fixed weight packages. Therefore, application identifiers would not be incorporated into its system.

When assessing print options, Rich Products performed an item-by-item class analysis:

- Non-dairy could use fully coded preprinted corrugate boxes based on volume, space considerations and consistency of the product's ingredients. Corrugated box manufacturers were required to verify the readability of the cases before they came in. The first 10 are pulled and verified; thereafter, a random verification of readability is conducted.
- Bakery's requirements were very different. In the frozen dough plants, the use of a Digital Case Printer (DCP) made more sense, because the product ingredients change regularly, 15 to 20 box sizes had to be taken into account, the environment was flour intensive and the label had to be readable in a low lighted, freezer environment. (At one point an ink jet system was tried. Flour caused the ink heads to jam, so this system was pulled out.)

The DPC is an off-line piece of equipment used to imprint bar codes on corrugated cases in house and:

- Allows the plant to use generic plain corrugated box stock (with generic preprinted information such as corporate identification, basic handling information and pallet pattern) while conserving packaging materials.

- Works fast (40 to 45 boxes a minute).
- Allows for needed flexibility in number of boxes due to the variation in yield.
- Is simple to operate.
- Allows the user to generate label information and have a revised label generated in all plants at the same time, adding consistency across manufacturing locations. No one manually keys in revised product information (such as a different ingredient), reducing the chance for error.

An on-line scanner with a 99 percent scan rate is used for code verification.

For cost reasons, a few Rich Products plants apply pre-printed pressure labels by hand.

Reaching 100 percent case compliance while being mindful of costs was an important consideration. No one wanted his or her operating budget to be affected. Through a phasing-in period, Rich Products was able to use up what was in inventory without destroying product and “seamlessly move into bar coding and SPID.” This transition period required an estimated four to six months.

### **The Customer in the Equation**

For the most part, Rich Products’ foodservice customers do not yet require the use of standard product identification or bar codes. Some foodservice customers that carry bakery items, such as club stores or cash-and-carries, do require bar code use. The company said these customers require dual bar coding, i.e., the use of ITF-14 and U.P.C.-A on the inner package.

The use of bar codes among Rich Products’ foodservice customers is gaining momentum. Many of its broadline distributors add bar codes if their suppliers don’t do so.

Rich Products has had no complaints from international customers as a result of using I2/5 rather than UCC/EAN-128.

## **Looking to the Future**

Rich Products is focused on ensuring that its bar codes are the right size and in the right location. Size and location are major concerns/control points when using hand-applied labels.

The organization is also addressing the dual bar code requirement of some of its customers. An experiment is underway whereby the ITF-14 is placed on the side and the U.P.C.-A on the bottom of the product. The industry has reached no consensus on the placement of dual bar codes.

Internationally, Rich Products is now testing shipping cases with six languages on one box.

## **Advice to Those Who Wish to Move Ahead**

Designate a project champion, one person responsible for the full execution of the project. Assemble a good cross-functional team. Use your internal and external resources. Keep your receiving dock employees informed; they can be another set of eyes to ensure compliance. Phase in the project to reduce or avoid the destruction of inventory.

Educate! Communicate what you are doing and the benefits you foresee.

## ***Tyson Foods, Inc.***

### **Motivation**

In 1993 the Efficient Consumer Response initiative published *Enhancing Consumer Value in the Grocery Industry*, which underscored a vision of the future for the food industry. EDI and bar coding were identified as enabling technologies that would enhance communication with the customer and promote greater operating efficiencies. Tyson Foods decided it needed to move forward with these enablers to address its strategic direction for the future.

During this time there was also serious thought being given to improving the company's product recall process. At the time, the organization's process was manual, costly and training intensive. As sales volume grew, the manual entry of production data for each shipment offered increased potential for errors. Concerned about the accuracy of its information, Tyson Foods also assessed bar coding as a possible solution for its product recall needs.

### **Benefits**

Tyson Foods realized many benefits, both expected and unexpected, from bar code and EDI implementation:

- Its food safety goal was achieved. The company's team created a best practices structure that met the goal of having in place a reliable product recall system. This system "bought speed." The information is accurate and available sooner. If necessary for a product recall, Tyson can determine the hour a product was produced and exactly where it was distributed, and in a much shorter time frame than before. This ability to recall product more specifically would reduce the number of cases being recalled.
- Efficiency increased. In the early phases of implementation, Tyson noted an increase in efficiency of 15 percent to 20 percent. Later, the efficiencies were even greater. Time to pick and load product was drastically reduced, and the time saved in receiving and billing out trucks was huge. Tyson distribution centers went from four clerical people per shift as receivers to one (for a 24 hour/7 day week). Over 600 man-hours weekly, not to mention the time required for annual inventories, were saved as a result of the elimination of weekly physical inventories.

- Although business has grown substantially since the system was put into place, the company has been able to support this business with the same number of people it had before.
- The accuracy and breadth of data improved when the old system of manually entering data on each case was eliminated.
- Bar coding improved inventory management. Costs associated with spoilage, damage and returns fell due to more information (code dating) and better controls. Tyson's by-bay accuracy now approaches 100 percent, boosting productivity in the distribution center.
- Shipping information is more timely. Tyson uses many third party logistics providers. Four years ago the company met with its major providers and spelled out the Tyson vision and framework. At that point most providers lacked EDI capability, and Tyson typically had to wait 24-48 hours to obtain shipment status from its providers. Some of its third party providers now use EDI transaction sets to report shipment status, and this information reaches Tyson as quickly as it is entered into the system, (i.e., within hours of product leaving the dock).

Case and pallet labels are tied to the Advanced Shipping Notice. This information is used internally to support timely product movement information

Invoice deductions decreased 17 percent between 1995 and 1998 for those companies using the U.P.C. code.

### **Where They Are Today**

Tyson Foods uses standard product identification on all of its products. Each product is assigned a standard U.P.C. number and an internal nine-digit product/brand identification number. Individually packaged items within a case contain the 12-digit item U.P.C. Some items are also assigned the UCC/EAN-128 if there is a business need to provide the additional information supported by application identifiers.

Variable weight cases use the UCC/EAN-128 perishable standard bar code. This format requires application identifiers that include the GTIN, a date selected from kill date, pack date, sell-by date, or use-by date, as well as the package weight and a unique serial number. The date field of the bar code usually contains the packaging date.

All Tyson Foods pallets are assigned a license plate number using the SSCC standard. The bar code for this number is encoded using the UCC/EAN-128 symbology. The pallet label uses the application identifier for serialized container codes.

Advance Shipping Notices (ASNs) are being provided to only a few customers directly. Tyson has had this capability for many years, but customer interest has been slow to develop. Tyson Foods does use its ASN capability internally, and all of its foodservice brokers receive ASNs to provide timely order fulfillment information.

Upon request, Tyson Foods will bar code private label products using standard U.P.C. and ITF-14 numbers. All cases are encoded with a GTIN. This number may be assigned by either the customer or Tyson.

### **How They Got There**

Using the vision spelled out in the ECR publication *Enhancing Consumer Value in the Grocery Industry*, Tyson put a team into place to study the options and move the project forward. The initial strategy was to bar code pallets as they entered the internal distribution chain, using a pallet license plate as defined by the UCC.

Members of the implementation team spent a day at the UCC to “walk through the vision” and learn how to implement a best practices bar coding structure. They learned how the standards worked, especially for perishable products, which included product code and the use of application identifiers.

After assessing their goals and digesting the information obtained at the UCC, the Tyson vision was modified to incorporate the use of standard product identification, bar codes and 30 EDI transaction sets. In implementing the project, Tyson decided to simultaneously launch efforts to apply pallet-level bar codes as well as case level bar code labels to every variable weight case. The production facility effort focused on labeling variable weight cases and configuring pallets with license plate numbers (LPNs) for shipment to major Tyson distribution centers. This was coordinated with the implementation of third-party software at the distribution centers.

One of Tyson’s requirements was to support variable weight products. As Tyson’s identified symbologies that made sense for their products, it was decided to use the UCC/EAN-128 perishable standard bar code for external use as a service to customers. However, to fulfill internal requirements, a bar code for internal use was implemented that conveys

weight, lot number (day of production, hour of production and production line), as well as a unique serial number. This was done with an eye to ensuring optimum information if there was ever a need to recall product.

License plate numbers using the SSCC-18 standard are assigned to all pallets at either the processing facilities or the warehouse. Tyson worked with its software provider to develop a custom warehouse management system (WMS) that met the organization's unique needs. These needs included the use of LPNs, scanned receiving, directed put-away, directed order selection and radio frequency integration.

### **How It Works**

All products are assigned the UCC-12 and EAN/UCC-14 numbers when the product master record is created. For Tyson product, these assignments are automatic. For customer specified and private label product, Tyson keeps customers' UCC Company Prefix Numbers on file. The code is automatically assigned if the customer wishes. In other instances, the assignment is put into the system manually, using whatever number the customer specifies.

For some customers, Tyson also maintains the customer's item number for Tyson product, thus maintaining a redundant system. Orders are received through the use of a UCC-12 number, EAN/UCC-14 number, Tyson's internal nine-digit number or the customer's own number. The customer's number resides in cross-reference number tables that must be kept up to date to prevent the wrong product from being shipped.

The license plate number on the pallet is assigned at the production facility during shipment or at the DC upon receipt. For outbound pallets, the order selector scans the LPN of the pallet being shipped.

### **The Customer in the Equation**

Few Tyson foodservice customers require the use of standard product identification or bar codes. Some customers who distribute to other segments (grocery or club stores) use unit level UCC-12s and EAN/UCC-14s in the foodservice arena for efficiencies.

### **Looking to the Future**

Tyson Foods will steadily implement its best practice vision, working with and encouraging its vendors and customers who wish to improve efficiencies.

The company envisions a move to a single industry standard number (UCC-12 and EAN/UCC-14) within three to five years. To encourage bar code use across the value chain, Tyson publishes the standard UCC-12 or EAN/UCC-14 on all product order forms, price lists and invoices. The company is confident that the transition from the old product codes will happen, however slowly.

### **Advice to Those Who Wish to Move Ahead**

Start in an area where there are measurable benefits. Have project champions. Create a vision, and use both internal and external resources. Break down the project into segments attainable in short to moderate time frames; this keeps the momentum going while ensuring that the focus stays on achieving the long-range goal.

# Distributor Case Studies



*Each of these three distributor case studies underscores the underlying motivation to move ahead with standard product identification and UCC-compliant bar codes. The cases highlight the benefits enjoyed by these organizations and note what they think could be accomplished if the industry were at 100 percent adoption.*



## ***SYSCO Corporation***

“Without voluntary U.P.C. and bar code usage, supply chain efficiencies will never be fully realized.”

Bill Day, Controller SMS Financial Services

### **Motivation**

SYSCO’s motivation for moving forward with the implementation of bar codes is based on two convictions by SYSCO management:

- The use of standard bar coding enhances a company’s ability to serve the customer.
- It provides impressive internal efficiencies.

The customer expects the product on the invoice to be the same product that is on the truck. SYSCO believes that standardized bar coding, when available, affords SYSCO the opportunity to ensure that this is so, and that this capability is a competitive advantage. Being certain the product picked is the product ordered is a challenge for the food distribution community. When a supplier uses standard bar codes the distributor can be certain he is fulfilling the customer’s order with complete accuracy.

Internal systems benefit from maintaining only one number in SYSCO’s system for each supplier’s products. SYSCO’s relatively advanced warehouse management system maximizes the use of accurate and complete bar codes. The availability of these codes affects the efficiency of the entire warehouse, from receiving to slotting to picking to loading.

### **Benefits**

SYSCO reports that the chief benefits realized thus far are increased efficiency and knowledge. Specifically, on those products that offer standardized bar codes SYSCO enjoys reliable and accurate information on product movement. This information has facilitated the implementation of category management efforts. Due to the integrity of master file data, SYSCO has accurate and timely information on supplier performance. SYSCO also reports the ability to use this timely information to manage fewer items.

SYSCO has identified 100 percent ship accuracy as a benefit of the use of bar codes. In addition, it can easily provide customers with information as needed.

The use of standardized bar codes has also increased SYSCO's ability to use electronic commerce.

### **How It Works**

SYSCO met with its suppliers and communicated its vision. This discussion focused on the benefits of bar coding for both the supplier and SYSCO.

As part of this effort, SYSCO identified which products in its database lacked U.P.C. or bar code data, or had incomplete data. It implemented an automated method of identifying products in its warehouses that were not EAN/UCC compliant.

All products now carry one item number. The preferred method of assigning this number for each discrete item is through the supplier's use of UCC codes. When that is not available, SYSCO assigns a number identifying that product in its master files, which are monitored regularly. When an item becomes UCC compliant, that number is assigned to the item.

### **The Future**

SYSCO is committed to pursuing standardized product identification and bar coding, and to completing its bar code project within 12 to 18 months.

## ***Maines Paper & Food Service, Inc.***

### **Motivation**

Maines Paper & Food Service identified real time, accurate data as a key strategic priority. Bar coding and warehouse management were deemed a means to achieve this goal. Maines envisioned a system that would provide accurate information, facilitating smart management of the business. This vision included superior fleet management, proactive warehouse management and expense control through process management. To reach this end, placing bar codes on all aspects of the business appeared to make sense.

Maines Paper & Food Service is a foodservice distributor based in Conklin, N.Y. It operates warehouses in Conklin and in Cleveland, Ohio. The Conklin site is a state-of-the-art facility that opened in the fall of 1998 with a comprehensive warehouse management system in place to take full advantage of bar code technology. The warehouse is a broadline facility handling 15,000 items serving the entire Northeast.

### **Benefits**

In implementing a bar code based warehouse management system (WMS), Maines expected timely and accurate data to help reduce operational costs and boost efficiency. Since the system was implemented, Maines has identified a 15 percent increase in selection process productivity. It attributes this productivity increase in part to its ability to scan work assignments and have the system map out the most efficient way of selecting product based on the WMS's knowledge of where product is located.

Bar codes have proved to be as efficient a workflow tool as Maines hoped. Product is verified as it comes into the warehouse, bar coded and placed into bar coded pick slots, where it is efficiently selected, verified and shipped out. Travel time during the selection process has been reduced. Mispicks have been greatly reduced. Early identification of shorts (temporary out of stocks) has been facilitated. Selecting first in/first out has been integrated into the process. Product returns and damage have been significantly reduced, and if a product is returned, the warehouse handles it much more easily (placing the product in the right location to be selected).

Maines also believes its potential storage density has increased because of better product management and tracking.

In addition to more accurate reports, the organization has benefited from a more streamlined order processing process. Errors have been minimized due to a reduction in the need to key in numbers. Because there are fewer mispicks and shorts, there is less credit tracking and follow-up paper work – and more customer satisfaction.

A sizable fringe benefit of bar coding was improved asset management. All 350 of Maines' tractors and trailers are bar coded. All batteries have been bar coded. Before the implementation of the bar code system, battery changing and watering had been a problem, the accurate record-keeping needed to maximize battery life had been a challenge. By scanning bar codes, Maines Paper & Food Service can now keep records that easily obtain full life from its batteries, which is a substantial cost savings over time. The company expects to expand this program to other equipment.

### **How It Works**

Maines uses bar codes on cases and pallets throughout the warehouse, thus efficiently moving product from the dock to the customers' back door. Rather than the ITF-14 or SSCC recommended by the Uniform Code Council, Maines uses codes with the same number of digits. At the time of the interview, Maines estimated that less than half of incoming product carried bar codes and that not all cases with SCC-14 bar codes were scannable.

Maines plans to switch to the voluntary industry standards once more of its vendors are using them. It said it is "completely set up to take advantage of the ITF-14 and SSCC bar coding."

### **Receiving Process**

Twenty percent of in-bound product arrives palletized; 80 percent of this product has multiple items per pallet. The receivers verify that the quantity of product coming in is the same as the number ordered and is the correct product(s). The receiving document is scanned as the product comes in, and a bar code label is generated and placed on the pallet, which is scanned and moved into the system for slotting. This pallet license is an 18-digit bar code. The putaway driver scans the location as he puts the product away.

Two items are keyed in upon receipt of product, the expiration date and the manufacturing date. At this time, lot codes are not tracked.

### **Selection Process**

The selector scans his identification badge, and the computer provides him with a work assignment based on optimal use of the bar code information in the system. As the selector picks cases, he places a bar code label on each case he selects. These labels contain 14-digit Maines bar codes.

### **Outbound**

The pallet arrives at the dock with (1) unique case labels that are scanned to verify outbound inventory and (2) a pallet control label (flag) that assists the driver in loading his truck for efficient delivery. The loader has a computer-generated, printed document that he verifies as he scans the pallet of product on his list. The system notifies him if he is missing a product or pallet before shipment occurs.

### **The Future**

Maines Paper & Food Service will continue its aggressive use of bar codes. The organization believes bar coding has significantly improved warehouse efficiency, customer satisfaction and equipment longevity/management.

As more manufacturers adopt bar codes, Maines looks forward to migrating its system to the voluntary industry standard SCC-14 and SSCC-18 bar codes. Maines would like to receive Advance Ship Notices (ASNs) from its vendors.

The company believes bar coding has helped it maintain accurate information and put into place more efficient business practices. It looks forward to eliminating the extra steps involved in placing its own labels on cases and pallets.

## *Quality Foods, Inc.*

“Foodservice is poised to be a clear leader with the growth potential in this channel. Our customers will expect leading technologies; bar codes and U.P.C.s are the base foundation of that technology.”

Philip Tappan, President

### **Motivation**

Quality Foods identified standard product identification and the use of voluntary industry standard bar codes as a priority for its organization due to four issues:

- The proliferation of new products. The number of SKUs that Quality Foods carries has been increasing, causing more complexity in inventory management. Standardized product identification and standard bar codes were seen as likely to ease this problem.
- Changing demographics in the workforce. Scanning a bar code takes the guesswork out of reading a case or item label for employees who may not speak English as their native language, and makes receiving, putaway and picking more accurate and efficient.
- Rising customer expectations. Quality Foods found that its customers were working to become more efficient, and some were requesting a common product database. Customers want to improve their inventory control through the use of U.P.C.s at the item level.
- Future requirements. Quality Foods wanted to be ready to take advantage of continuous replenishment systems. It became obvious that a common reference point with vendors was a necessary part of achieving that goal and that the use of standard bar codes was the logical first step.

With these issues in mind, and with a vision of a more efficient organization, a management team was put into action. It consisted of the President, the Warehouse Director (who championed the project), the Information Systems Director and the Purchasing Director. Each brought their own perspective to working together to develop the systems, disciplines and ideas to implement the use of EAN/UCC codes to receive and identify product.

## Benefits

Quality Foods said bar codes have increased accuracy and efficiency, but only about 40 of the product received by Quality Foods has UCC specified bar codes.

Where they exist, bar codes help receivers identify the product so that it may be slotted correctly, which improves picking. The primary savings that Quality Foods is experiencing is a reduction in time spent identifying the product.

There is also a lower expenditure of time on re-do work because the right product is placed in the right pickslot. This cuts down on warehouse rework as well as all the paperwork that produces errors. Plus, the customer is happy because the right item is shipped.

Products with bar codes that convey catch weight information save both time and labor. It takes about 10 seconds to scan each item, compared with an average of two minutes per item needed for manual gathering and keying.

The amount of returned product has been greatly reduced (to about 0.9 percent) and when a product is returned it can be quickly scanned, identified and reslotted. Scanning eliminates incorrect reslotting due to a misunderstanding of the product ID, as well as minimizing the cycle time spent on product identification.

Quality Foods learned that eliminating the keying in of catch weight information eliminates the potential for human error. Quality Foods also recognized the food safety benefits of bar coding, including:

- Better product rotation
- Ability to immediately locate a product in inventory or know where it has been shipped
- Ability to scan expiration dates as the product is received and reject it at the dock if it is out of date.

Further, with slotting errors kept at bay there is no question that the right product is shipped to the customer thereby addressing diet restrictions and their implications to food safety (e.g. fat-free, sugarless or kosher).

## How It Works

With the vision of managing its warehouse through the use of bar codes, Quality Foods built its warehouse management system around the use of UCC bar codes (item and case codes).

The President wrote to vendors about the importance of bar codes to Quality Foods and urged them to use the voluntary U.C.C. bar codes.

About 40 percent of product arrives with standardized bar coding. Quality Foods scans this product at the dock and uses the information to assign a pick slot.

Quality Foods currently assigns all product a six-digit internal item code. Having the U.P.C. speeds up product identification and ensures that product is assigned to the correct slot. Migrating to the industry voluntary standard product identification from an internal code is deemed an objective for the near future, as more manufacturers bar code their product.

The company's purchasing orders and putaway system use the U.P.C. number when available, but for the time being, Quality Foods is running dual systems (U.P.C.s and its own six-digit ID number).

### **The Future**

Quality Foods believes that the use of bar codes is a more efficient, less expensive way of doing business. It is evaluating the use of SSCC to identify pallets, since it appears to benefit from its vendors' use of the SSCC receiving Advanced Shipping Notice (ASNs) and having the details of that pallet available to scan into their system. Likewise, Quality Foods customers might benefit from receiving an ASN before they received product.

Quality Foods intends to continue to refine its use of UCC voluntary standard bar codes, and to encourage vendors to use the U.P.C. information, assess the savings and document the increases in shipping accuracy/customer satisfaction.

The company believes that continuing this approach will improve order accuracy, increase productivity and reduce human error.

Category management is also targeted as a near-term project. The use of voluntary standard bar codes is considered an important aspect of moving forward with this endeavor.

This case study demonstrates the importance of a strong desire to use voluntary standard product identification with UCC compliant bar codes and the readiness to do so.

# Operator Case Studies



*These three case studies boldly note the advantages of using UCC compliant bar codes in the operator community. The savings, efficiencies and tracking abilities afforded by the use of standard product identification and UCC compliant bar codes are all good business practices recognized by these operators.*

*The following pages highlight the operator community's readiness for total implementation of standard product identification and UCC compliant bar codes.*



## **ARAMARK Corporation**

*"If you are not living on the edge, then you're just taking up space."*

ARAMARK Executive

### **Motivation**

ARAMARK Corporation handles 60,000 items, has operations in 4,000 client locations and prides itself on creating "value, one customer at a time through unlimited partnership."

Three years ago ARAMARK started a project to prepare for Y2K issues and to create a system that provided its clients and users with more value. Through focus groups made up of both internal and external individuals, ARAMARK set four ambitious goals:

- Improve finance and accounting systems
- Be more responsive to front-line managers
- Address the need for accurate and timely data
- Track and measure performance

ARAMARK had a vision and embarked on its actualization. Although the four objectives were thought of as equal, the system changes focused on front-line managers were the highest priority. One of those changes centered on supply chain management.

At the same time, the foodservice industry was launching the Efficient Foodservice Response initiative. The timing was perfect. The basic tenets of the initiative rang true to what ARAMARK had heard from focus groups and offered usable solutions to supply chain challenges. The voluntary use of standard product identification and bar codes was identified as a way to help ARAMARK achieve its goals.

As ARAMARK planned system changes, it decided that using standard product identification numbers and UCC compliant bar codes would play an integral role through:

- Making ordering easier
- Taking the “pain” out of the daily/weekly/monthly inventory process
- Minimizing or eliminating duplication of efforts
- Providing accurate information -- in real time
- Making putaway easier
- Assisting in more accurately measuring performance
- Reducing labor by reducing steps, and thereby reducing human error and costs

### **Benefits**

Market Center, a division of ARAMARK, implemented a self-designed bar code system about two years ago, using software designed by a field employee and currently supported by the Corporate IS department. The experiences of this Market Center reinforced ARAMARK'S determination to move ahead with standard product identification and UCC compliant bar codes.

Asked to name the biggest benefit of this system, ARAMARK said: “efficiency.” The use of a bar code system allowed the Refreshment Services Division to know what was happening at each of several warehouses on the same day. Prior to bar code use, the paperwork was sent to the division office, resulting in a day of lag time and possible paperwork errors. Today the information is scanned with handheld scanners and downloaded at the end of the day. It is available for use at the division office that same day.

The use of bar codes at the item level also enhanced the organization's inventory management capabilities. This ARAMARK location maintains item information in full detail. A quick, clear understanding of the number of items bought, number shipped out and number damaged is easily obtained.

Each week, warehouse inventory is reconciled, a much easier process now. Before, if inventory was short by 10 candy bars, ARAMARK had to count every piece of candy to find out what was short. Now they know exactly which bars were “off,” and in a far shorter time.

Bar coding also affords management much better control. This ARAMARK division office was able to reduce inventory on hand because they always know what's there. Therefore, carrying cost was reduced. As a result, ARAMARK implemented an automated ordering system with its primary supplier to keep the right amount on hand.

The company's bar code system has saved time and money. ARAMARK no longer keys in product information. It is now scanned, eliminating the human errors that are an inevitable result of manually entering data.

Consistency was also identified as a benefit of bar code use. When product is received, the system generates an Accounts Payable keying document. In the past, the documentation may have been incorrect because of an error at the receiving point. For example, the receiver may have assigned an incorrect account code to the product, e.g., a snack code rather than a candy code. This error would spread through the system, making reconciliation very difficult as well as distorting financial results. The new system generates a report that assigns the correct account code to products being received. This eliminates the possibility of error and makes reconciliation much easier.

### **How It Works**

For inbound product, every item is assigned a bar code except fresh food and pastry.

For outbound product, use of bar codes has vastly improved ARAMARK's picking process.

Route drivers pick their own truckloads. After they return from their route, they take a handheld scanner and a handcart to pick what is needed for the following day. As the product is scanned and moved to the cart, the system tracks what is being picked. The contents of the handcart are checked by a supervisor against the pick list to verify what was selected and then signed off by both the route driver and the supervisor.

ARAMARK recognizes that supplying product identification numbers and internal bar codes is not the most efficient use of time. It does not want to support separate bar code systems for its divisions, and the divisions do not want to use their resources creating numbers, developing software and maintaining a system that is unique to its business.

## The Future

ARAMARK feels there are vast benefits to be achieved through the use of standard product identification and bar codes throughout the company. It is committed to implementing an organization-wide system that is consistent with the use of UCC compliant bar codes. With this objective in mind, the organization is investing monetary and personnel resources to develop a common platform with the ability to support UCC compliant bar codes.

ARAMARK looks forward to the day when manufacturers supply it with products marked with bar codes on both the outer and inner packages.

The company acknowledges that this will not happen overnight. But the advantages are tantalizing:

- Accurate information
- Efficient inventory management
- Product tracking ability
- Enhanced communication throughout the supply chain
- Removal of costs from the system

That's a list that is well worth the investment, and the effort required to bring it about -- for the industry as well as ARAMARK.

## ***Rosemont Suites***

*“This is the future of foodservice management. Using bar codes has simplified most administrative aspects of our business and has put cash into our pocket! We now pride ourselves on working smart.”*

Chef Woods, Rosemont Suites

### **Motivation**

Rosemont Suites is an urban airport hotel that offers fine dining and banquet services. The management philosophy is very technology oriented. When approached by a technology company to put into place a system that would assist in inventory management, provide more accurate information and increase efficiency, they were willing to give it a try.

Management had no “burning issue” but did feel that this software, which relied on the use of voluntary standard bar codes, could streamline some activities (such as receiving and taking inventory), could be useful in developing more efficient processes (such as ordering and maintaining recipes) and could ease the workload.

### **Benefits**

The benefits of using voluntary standard product identification and a scannable bar code exceeded expectations and had a strong positive impact on the hotel’s bottom line.

**Inventory Control:** The hotel had a system in place that required four people to spend at least three hours each month inventorying the food stock. It was paper-based, with out of date product pricing in some cases. Once this activity was completed, the paperwork went to finance, where four to six clerical hours were spent each month reviewing and inputting the information. Human error led to numbers being transposed or misread from time to time as the three departments tried to reconcile results. Financial statements came back to the chef and purchasing agent two weeks after the end of the month. The liquor inventory was done in a similar fashion on a monthly basis with weekly spot checks in between.

The scannable bar codes enabled one staff member to take inventory on a monthly basis in an hour and a half. The prices were accurate, the reports were produced in a timely fashion and tracking product sales became easy. The financial reports are turned around in a day, which has a positive effect on inventory management, decision making and problem solving. Having an almost immediate knowledge of monthly food costs has been very beneficial.

**Purchasing:** The order entry module contains each vendor product shipping container code and UCC-12. When the order is generated, it shows the UCC-12 and EAN/UCC-14 number, as well as price information.

The quick, manageable inventory management cycle also has had a positive effect on purchasing. With more accurate, timely information, management found that purchases were more closely aligned to counts. There was less wasted food. There was a record of what was sold against inventory. Plus, the system generated a Purchase Order when a defined reorder point had been reached. Food costs were better managed, and having the standard product codes in the database afforded easy price comparisons and more cost effective ordering.

**Vendor Management and Receiving:** At the inception of the project, Rosemont Suites had 70 vendors. It came to believe this was not efficient and sometimes caused chaos when the products were received. The paper trail for orders at receiving was not always available. Price questions were sometimes an issue.

Rosemont Suites now has 32 active vendors. It believes it is achieving several benefits from consolidated volume, including improved time management on vendor calls. Product receiving has become an easier and a more efficient process.

Rosemont Suites prefers products with voluntary standard product identification. About 60 percent of the products received lack standardized bar codes. Where no UCC-12 or EAN/UCC-14 exists, the software program generates a scannable label for inventory tracking purposes.

As product is received it is accounted for against the computer-generated paperwork and put into inventory. There is no doubt about what was received and at what price. Invoice errors are caught earlier and dealt with. There is also less damaged product due to better receiving management/protocols. Further, there are now records of vendor performance.

Food Costs: “Everything goes back to food costs, and the food costs have dropped,” Rosemont Suites said. Through more efficient time management, effective inventory control, less damage, less waste, better communication with vendors and accurate information, Rosemont Suites has reduced food costs 2.6 percent.

### **How It Works**

The chef asks all vendors to provide their product catalog through e-mail or on diskette so that he can download this information into Rosemont’s system. All product updates and price changes are requested in this manner. The standard UCC-12 and EAN/UCC-14 are captured if available. (Fifty percent of product received has a UCC-12, and 5 percent has an EAN/UCC-14). If they are not available, numbers are generated using the same number of digits as a UCC item and case number and put into the system. In all cases, Rosemont Suites also captures the vendor’s identification number. If a vendor provides neither EAN/UCC numbers nor a proprietary number, a vendor identification number and item number are assigned.

The order is generated using the vendor identification number and the case and unit bar code numbers. This information is used when receiving and verifying a delivery. The system also specifies delivery days for the vendor.

The software generates a bar code label that is used at receiving if the product does not carry an assigned UCC standardized bar code. Products are labeled as they are received and put into inventory. The stocking shelves are also identified by the bar code label.

Product substitution adds additional steps during receiving. When substituted product is logged in, the receiver gets an error message. To receive the product, Rosemont personnel create a new product, key in a substitute item number and assign a unit bar code with a flag that the product is not to be reordered. Rosemont said this disrupts the receiving process but will pay off when electronic invoicing is implemented because the substituted product code will not have to be keyed, saving time.

Liquor is inventoried weekly by scanning the product at the unit level. All other items are inventoried monthly in the same manner. A handheld scan gun is used in both cases.

Rosemont compares what was sold to available product in inventory. The system generates a purchase order when the inventory reaches a specified point.

### **The Future**

Rosemont's vision is to continue to aggressively use voluntary industry standard bar codes and to encourage its vendors to move in this direction.

The organization would like to be able to scan product into its system as product is received.

Rosemont is also tracking vendor performance. It noted that delivery, substitutions, out of stocks and freshness all come into play when evaluating preferred vendors. Rosemont believes that by using voluntary bar codes it will benefit from better inventory management and therefore will be able to more effectively meet its expectations.

## **Taco Cabana**

*“It is simple. Bar coding helps improve the accuracy and speed of the receipt and inventory process, and that benefits everyone, especially the managers of the restaurant. That is why we use it.”*

Brian Callahan, Chief Information Officer

### **Motivation**

Taco Cabana is a Tex-Mex fast food chain that originated in San Antonio, Tex., in 1978. It operates 121 locations in five states.

Taco Cabana’s move to a bar coding system was motivated by three factors:

- It wanted more accurate receiving and inventory information.
- It wanted a more efficient way to receive deliveries and account for product on hand.
- It wanted a better way to track volume and document purchases more reliably. It suspected that better records would facilitate the negotiation of better deals.

With these objectives in mind, Taco Cabana implemented a bar coding system in 1994.

### **Benefits**

Taco Cabana achieved all three objectives -- and received other benefits it had not foreseen when it first implemented its bar code system.

Receiving of goods has become an easier process. The receivers go down the line and scan the product as it comes in. This information is uploaded to a PC, and the quantity and price are verified. The driver’s name is keyed in and matched to the receipt ticket. If there are errors, they can be handled on the spot. If the price or quantity is wrong, the company reconciles it.

One of the benefits of using bar codes and bar code scanners at receipt is the vast reduction in paperwork. Taco Cabana operates almost totally without paper invoices. The information is uploaded from the PC and becomes invoices, which are fed to Accounts Payable for payment. Before the implementation of this system, Taco Cabana staff used to key in all their invoices; now they key in 20 percent. This has greatly reduced errors and saved a tremendous amount of time.

Purchase order matching is done at the dock, and this also saves time. Taco Cabana's bar code system has afforded the organization the ability to accurately document and track purchases as desired. By uploading scanned receiving information, reconciliation of purchase orders to invoices has been all but eliminated. Nothing is keyed in, thereby eliminating typing errors. Taco Cabana's objective to track its volume easily and use this information to negotiate better deals was accomplished.

Inventory management that was once time consuming and difficult has become easier. Cost of sales (COS) figures are more accurate and available immediately down to the raw item level. This system has made it easier to implement a system comparing the raw item level COS to a theoretical COS using receipts. The scannable bar codes enable Taco Cabana to take inventory daily. Each store spends about 15 minutes a day in the cooler inventorying the "expensive" product and about an hour a week taking total inventory.

The results of this practice are:

- More accurate information
- Lower cost of sales
- Reliable reports

In summary, Taco Cabana benefits from better inventory management with substantial time and cost savings.

## How It Works

Taco Cabana receives 99 percent of its product from one distributor (about 300 products, not counting liquor and office supplies). It has an agreement with this distributor that all products will be bar coded before they reach Taco Cabana's receiving dock. Taco Cabana felt so strongly about the use of bar codes by its primary distributor that non-compliance was a contributing factor in switching distributors.

The distributor is responsible for placing the bar code in a position that can be scanned upon receipt with Taco Cabana's scan gun. The scanner used is a Symbol PDT3100 which has a cradle serially connected to a PC. The inventory system is IMS, co-developed with a software vendor from Plano, Tex.

Taco Cabana has its shelves set up so that there is a tag on each shelf that carries each product's bar code. If the product has a U.P.C. number, that code is used; if it does not, the tag carries the bar code assigned by Taco Cabana's distributor. Both are loaded into the system, and either can be used to scan the product.

The product identification number is tied to a master item number that is used throughout Taco Cabana's system. The master item is used in recipes and is independent of manufacturer.

## The Future

Migrating to UCC compliant bar codes is well within Taco Cabana's vision. The organization looks forward to the day when its incoming cases contain application identifiers conveying case weight information and shelf life information. Saving time and having critical information is definitely a priority.



ABC Inc. is a \$500 million manufacturer of food and nonfood products used by thousands of chain and independent foodservice operators across the country. Operators purchase ABC's products from ABC's customers -- hundreds of large and small broadline, system and specialty foodservice distributors. ABC produces its own line of branded products and products under other labels. These items are (1) co-developed, produced and packaged for proprietary use by individual restaurant chains or (2) produced as part of distributor or group branded lines of products.

ABC produces and ships approximately 20 million cases a year to its distributor customers directly from its plants and from four distribution centers. Two are co-located at plants; two others are market-based. Third-party logistics providers operate two of these facilities. ABC tenders third-party carriers to ship products to customers' distribution centers. Distributors' carriers pick a substantial number of customer orders by appointment at all ship points.

Items are produced in six ABC-owned plants, plus a number of other contract-manufacturing plants. Items are packed in five case types:

- Dry, standard weight cases (nonfood)
- Dry, standard weight cases (food – requiring lot tracking)
- Chilled, variable-weight/perishable (short-life) cases
- Frozen, variable-weight/perishable cases
- Frozen, standard-weight/perishable cases

Cases are palletized in a single-item, standard configuration (tie and high) at the end of each manufacturing line. Pallet-quantity orders are filled using these standard pallets. Other quantities are shipped on mixed-item pallets that are built when customer orders are selected for shipment or pickup.

Recently, changes have been taking place in ABC's external business environment. A number of recent outbreaks of food-borne illnesses had focused public and regulatory attention on food safety. To minimize the risk of ABC products being involved in a crisis, ABC decided to implement a Hazard Analysis and Critical Control Points (HACCP) program, as well as a solid and fast recall system.

## ***Appendix A: Manufacturer Successful Practices***

Further, consolidation in ABC's customer base was creating fewer, larger customers, each with unique and changing requirements for doing business with ABC. These evolving needs, including electronic commerce, product/case labeling and shipping information requirements, required new capabilities at ABC.

Internally, ABC's sales have continued to grow for several years, propelled by consumer demand for prepared food and the success of ABC's new product introductions. The increase in transaction volumes, coupled with a volume increase resulting from a recent acquisition, stressed many of ABC's manual processes to the point of breakdown. Inventory accuracy, shipping errors and administrative costs were out of control.

The final straw was ABC's information systems, which were to various degrees non-Y2K compliant. These factors drove the decision to implement an Enterprise Resource Planning(ERP) system to support ABC's growing business operations. The ERP implementation opened a window of opportunity for ABC to improve its operations and upgrade its service capabilities.

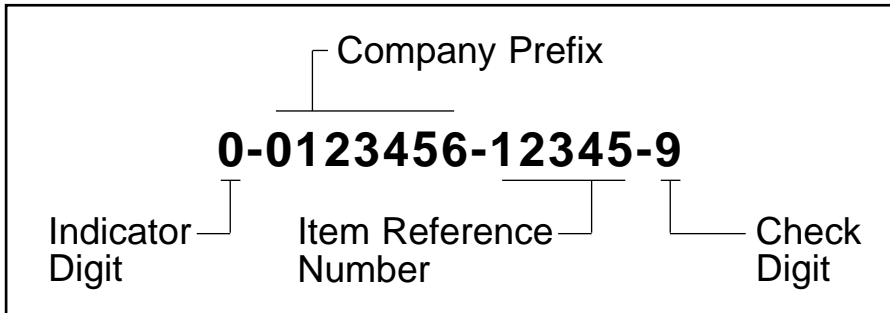
The convergence of these external and internal pressures over several years led ABC to implement a program of voluntary standard product identification and bar coding. For best practices guidelines, ABC looked to an industry-wide initiative, Efficient Foodservice Response (EFR), that outlined a number of voluntary practices that industry participants could use to remove system-wide inefficiencies to the tune of \$14 billion annually.

One of these best practices is voluntary standard product identification and bar codes. These tools efficiently and accurately connect the movement of products with the movement and management of business information. In addition, they enabled other successful practices in electronic commerce and efficient logistics. Further, they enabled ABC to efficiently participate in a number of third-party information services, such as the IFDA PROFILE product database standardizing the communication of item information for ABC customers, potential customers and the thousands of foodservice operators who use ABC products.

The first step was to look at how items were uniquely identified internally at ABC, as well as externally to its customers, and foodservice operators. In the past, ABC had used a four-digit item number. Over the years, it had used nearly all of the available numbers and had begun to re-use and rationalize item numbers. It was limited in expanding the size of the number by its legacy information systems. The move to the

ERP system gave it an opportunity to rethink both the size and the numbering schemes it used to identify products.

A 14-digit item number was adopted for all items, cases and collections of products sold as a selling unit. The structure of this number is shown below:



Included in these 14 digits for all ABC branded item numbers is the UCC Company Prefix Number that ABC acquired from the Uniform Code Council. (This is a variable length number that has traditionally been assigned to 7 digits in length) This UCC Company Prefix Number is guaranteed to be unique across all manufacturers globally. This extends ABC's ability to uniquely identify its products beyond its own organization to the entire universe of distributors and operators, by using only one number per item for all purposes.

#### SUCCESSFUL PRACTICES CHECKLIST

- |   |     |    |
|---|-----|----|
| 1. UCC Company Prefix Number acquired?                | Yes | No |
| 2. Use UCC (GTIN) structure for 14-digit item number? | Yes | No |

For each consumer/operator packaged item that is produced (can, carton, bottle, bag), ABC assigns it a unique five-digit number. In many cases, this number could be migrated from the old number. In a few cases, old item numbers had to be changed or modified. This number is coupled with the UCC Company Prefix Number. One last piece of intelligence goes into ABC's item numbering scheme: the one-digit Indicator.

Traditionally, the UCC guidelines specified a packaging indicator of zero at the packaged unit level, with allowed values of 1-8 for different pack sizes of the same “zero” or unit-level item.

At this point, a new 14-digit unit has been set up in the system. Item level information is updated in the master record, including name, description, ingredients, nutritional information, and preparation and serving information.

The check digit on each of the case and pallet numbers is recalculated using the same modulo-10 algorithm and all of the values of the preceding digits. This feature of the UCC number system adds the capability to check for item number entry errors in information systems resulting from either manual data input or scanning. This has almost eliminated data entry errors relating to the capture of item number at ABC.

#### SUCCESSFUL PRACTICES CHECKLIST

- |   |     |    |
|---|-----|----|
| 3. Follow UCC guidelines in GTIN assignment to new items? | Yes | No |
| 4. Integrated item numbering (unit, case, pallet, etc.)?  | Yes | No |
| 5. Use a single item number internally/externally?        | Yes | No |
- 

#### **How ABC Deals With Non-ABC Branded Products It Produces**

ABC encourages item-specifying customers (operators, distributors and groups) to obtain their own unique UCC Company Prefix Number from the UCC. For those who voluntarily comply with ABC’s recommendation, item setup is simple and straightforward. The item-specifying trading partner provides the 14-digit GTIN number within the same UCC guidelines that ABC uses (including check digit calculation). This number is guaranteed to be unique within ABC’s information systems and universally across all other trading partners. This ensures efficient, error-free commerce between ABC and its trading partner.

For product-specifying distributors, groups and operators that have not acquired a UCC-assigned UCC Company Prefix Number, ABC acquired a second UCC Company Prefix Number to construct unique 14-digit UCC compliant item numbers. The use of this “generic” number dissociates non-ABC branded items from the company’s own line of products. ABC also assigns the five-digit item number. If the customer specifies its own number that is different, a secondary item number is established using an alias field in the item master records.

This is the only means ABC has to ensure that these non-ABC branded items are uniquely identified in internal information systems as well as providing for a universally unique number for external uses. Since non-UCC compliant numbers provided by specifying customers are not guaranteed to be unique, these numbers could be duplicated by others. As these customers acquire the UCC Company Prefix Number from the UCC, their item numbers are migrated out of this generic numbering scheme.

#### SUCCESSFUL PRACTICES CHECKLIST

- |   |     |    |
|---|-----|----|
| 6. Use UCC Company Prefix Number of customer for their branded items?                 | Yes | No |
| 7. Identification practices for product from customers who brand product without UCC? | Yes | No |
- 

The next step was getting this unique 14-digit U.P.C. number onto the units, cases and pallets.

For each packaged unit (i.e., items with Indicator = 0), ABC wanted to follow successful practices guidelines for U.P.C. bar coding. The U.P.C. number itself is the last 12 digits of ABC’s 14-digit item number. This omits the Indicator and the following digit when the U.P.C. is printed. The resulting 12 digits is the U.P.C. number, typically printed as 112345-56789 9. This number is encoded into bar codes using the U.P.C. bar code “language” or symbology to create the familiar bar code we as consumers see on virtually every food item we purchase in stores.

ABC worked with its vendors that design and print the labels and containers that are used for individual packages. Space was designed into all labels for the U.P.C. codes that met UCC technical guidelines (specifying dimensions, spacing, contrast, etc.). Film masters were produced to make the printing plates that the label and consumer-packaging vendors use to print ABC's product labels. As a result, all of ABC's items carried a bar code that can be consistently and accurately scanned

SUCCESSFUL PRACTICES CHECKLIST

- |  |     |    |
|--|-----|----|
| 8. 100% of unit-level item-labels have scannable U.P.C. bar codes? | Yes | No |
| 9. Verify, via test scans, the scan accuracy U.P.C. bar codes?     | Yes | No |

---

For case level labeling, ABC needed to contend with types of products/cases it produces and the specific internal and external requirements for each.

Getting the item number of the case and its associated bar code onto the case required ABC to examine its options:

**Basic options**

- Apply a self-adhesive label to the case.
- Print the item number and code directly on the case by:
  - Purchasing corrugate preprinted with the 14-digit item number and bar code. This is the most common practice. It requires a one-to-one correspondence between corrugate raw material items and finished goods case items.
  - Purchasing generic corrugate cases and installing an in-house case printer to apply item-specific information to the cases. This could be either "in-line" or "off-line" printing.

A detailed cost analysis revealed that there was no one way to do it, and ABC employed all three labeling methods to varying degrees.

For its high volume, dry, nonfood items, ABC decided to purchase corrugate with preprinted 14-digit item numbers and bar codes. Since this code would be printed directly on the corrugate, ABC decided to use the Interleaved 2 of 5 bar code language to encode the item number. This bar code language can easily be printed on brown corrugate so that it can be read accurately and consistently by bar code scanners. This method was also chosen for nonfood items that required a unique size of corrugate box. On a per-case basis, this was considered the lowest-cost alternative for the application of item numbers and bar codes.

However, for the many low-volume, dry, nonfood items, the increase in the number of raw material corrugate items ABC would have to stock made this an expensive option. An analysis revealed all of these items shared a dozen or so different sizes of corrugate cases. For these, ABC purchases generic corrugate stock and installed a case printer in the plant. When an item is to be produced, the case printer prints the item information on the generic corrugate case in the proper quantity to support the manufacturing run. These are then issued to the production line along with other raw materials.

Printing directly on the case represented a cost-effective solution for many items, but it had limitations for others. For example, for food items, ABC wanted to incorporate a wider variety of data than just item name and item number.

First and foremost, it wanted an efficient means to associate each case produced with its manufacturing lot for tracking and recall purposes, and it wanted this feature for every food item it produced. For many food items it also needed to incorporate dating information. At a minimum it wanted a use-by date on the label and wanted to be able to add manufacture date, sell-by date, etc., selectively. It also needed a way to capture case weight data for its variable weight products.

While the I 2/5 bar coding worked fine for dry, nonfood items, it had limitations when it came to these additional data requirements. The solution was the use of another bar code language for the cases of the remaining items. ABC found that the UPC/EAN-128 bar code language could encode not only the 14-digit item number but also application identifiers for the other data elements ABC wanted to place on its cases.

One reason this language can encode more information is that it is a “denser” bar code. That is, it uses a much tighter configuration of bar and spaces to convert the information to scannable form. The downside is that the bar codes cannot reliably be printed directly on the corrugate. The contrast between the brown corrugate and the ink of the bar code was insufficient to consistently get an accurate reading with a bar code scanner. This meant that these bar codes would need to be applied using adhesive white-background labels with the product and bar code information printed on them.

After a thorough investigation of the technical and equipment options, ABC decided to modify its manufacturing lines with in-line labeling. For those lines that produced variable weight product, this also required the integration of the in-line scales to the printer. When a production run is set up, the item number is entered. Information rules in the item master provide default values for sell-by and use-by dates based on the manufacturing date. This information is downloaded to the printer on the line.

The system automatically assigns a lot number that uniquely identifies the manufacturing run and updates the manufacturing records for the run with the finished goods lot number. This includes the formula used, ingredients issued and ingredient lot numbers. These are captured from ABC’s ingredient suppliers when materials are received and when materials are issued to the manufacturing line (or to the tank that feeds the line). This is the next area where ABC plans to apply the efficiencies of bar codes and scanning.

The manufacturing lot number is downloaded to the in-line printer. In the ABC system, the system assigned lot number is automatically combined with a Julian date code and an hour-of-day code (1-24) to create unique lots for every hour of the manufacturing run.

When variable weight cases are sealed on the processing line, they pass over an in-line scale that captures the case weights. This data is automatically fed in real time to the in-line printer. The high-speed printer then prints the case labels and applies them to the cases. A pressure sensitive label stock was selected to withstand the damp and/or cold conditions for temperature conditioned product that will be stored in a cooler or freezer.

This labeling option required a significant capital investment to the physical manufacturing line over the case printed option for the dry, nonfood products. Variable per case labeling costs also increased, since the labels that are applied cost \$5 to \$10 per 1,000. However, it did enable

a significant reduction in the corrugate raw material items that ABC had to stock. Generic corrugate could be used to support all items that use the same size case.

#### SUCCESSFUL PRACTICES CHECKLIST

10. 100% of case-level labels have scannable EAN/UCC-14 bar codes?	Yes	No
11. Verify, via test scans, the scan accuracy of case bar codes?	Yes	No
12. Lot number captured application identifier for food items?	Yes	No
13. Lot number tied to specific production line?	Yes	No
14. Lot number tied to specific production hour?	Yes	No
15. Lot number tied to actual formula used?	Yes	No
16. Lot number tied to actual ingredients used?	Yes	No
17. Lot number tied to ingredient lot numbers?	Yes	No
18. Variable weight application identifier for catch weight cases?	Yes	No
19. Dating application identifiers for perishable product?	Yes	No
20. Case information applied once at point of production?	Yes	No

There was one last labeling challenge in the manufacturing plants: the pallet label. At the end of each manufacturing line, a palletizer produces a standard tier and high pallet configuration for each case item. ABC management wanted the pallet label to contain all the information on the case label, including item number (except to use the 14-digit item number with the Identifiers allocated to pallets, 5-8), lot number, manufacture date, sell-by date, use-by date and number of cases on the pallet

ABC wanted to be able to uniquely track each pallet through its warehouse systems for both inventory accuracy and lot control. To uniquely identify each pallet, ABC needed to apply a unique "license plate" to

each pallet as it was created. ABC looked to the UCC for the Serial Shipping Container Code (SSCC) guidelines.

It is an 18-digit serial license plate number assigned to each pallet as it is created. The structure of this number is identical to the 14-digit item number, except that the five-digit item number field is replaced with a serial number that is automatically incremented by the system for each pallet constructed.

Since multiple palletizers are in use at the same time across multiple plants, ABC decided to use the first two digits of the serial number to indicate the serializing location by assigning a unique palletizer number to each. That is, the palletizer at the end of manufacturing line 1 is “01,” the palletizer at the end of line 2 is “02., etc. Since ABC has only 40 palletizing stations across all its plants (including co-packer lines), two digits were plenty. This leaves the remainder of the serial number that can be sequenced and assigned independently by the pallet label printer at the end of each line. After the maximum serial number is produced on any given line, the serial counter resets to 0,000,000 and repeats. Given ABC’s annual volumes, by the time the counter repeats the re-use of numbers will be well within UCC guidelines.

#### SUCCESSFUL PRACTICES CHECKLIST

- |   |     |    |
|---|-----|----|
| 21. Apply SSCC-18 license plate to each pallet? | Yes | No |
| 22. Apply pallet label at point of production?  | Yes | No |

---

This completes the “uniqueness” management functions at ABC for both items and pallets (with the exception of custom-built pallets, which will be explained later). It also completes the discussion of the physical application of these labels and bar codes to the items, cases, and pallets that ABC manufactures.

All Packaged Units

- 12-digit U.P.C. number + encoded with UCC-12 bar code
- Incorporated on unit label film master

Cases of Standard Weight Dry Product (nonfood)

- EAN/UCC-14 case code + encoded with ITF-14 bar code
- Printed directly on corrugate case with scannable quality

Cases of Standard Weight Dry Product (lot traceable food)

- EAN/UCC-14 digit case code + encoded with UCC/EAN-128 Code
- Application identifiers + bar coding in UCC/EAN-128

Lot Number

Manufacture Date

Use-by Date

- Printed on a label that is affixed to the corrugate case

Cases of Variable Weight and/or Perishable Product (Dry, Chilled, Frozen)

- EAN/UCC-14 digit case code + encoded with UCC/EAN-128
- Application identifiers + bar coding in UCC/EAN-128

Lot Number

Manufacture Date

Use-by Date

Net Weight of Contents

- Printed on a label that is affixed to the corrugate case able to withstand damp/chill/freezer conditions.

Pallets (Standard Tie-High Configuration of Single Item):

- SSCC serial number + bar coded in an UCC/EAN-128

If single item pallet:

SCC-14 digit item number + bar coded using UCC/EAN-128

Application identifiers + bar-coding in UCC/EAN-128

Case Quantity

Lot Number

Manufacture Date

Use-by Date

At ABC, all product movements capture date, time, person, pickup location, destination location and serial pallet number. In addition, all moves are directed; that is, the pickup and destination locations are predetermined and the fork truck driver is dispatched on a known route. This has enabled ABC to measure, manage and reduce travel time, increasing the productivity of both the driver and the equipment. The gains made here have enabled ABC to absorb the increased sales volume without having to add additional labor or equipment.

The system also keeps track of vacant storage locations to “know” where product can be moved. This enables dynamic storage of the pallets in any open location. By not requiring that like items be stored together, ABC has greatly increased the density and utilization of its plant and market warehouses. With volumes increasing, space was at a premium. Utilizing dynamic storage has pushed a capital expansion program well into the future.

When the palletizer completes a pallet, a label is affixed, in standard position, to one corner-case. A fork-truck driver scans the serial number (18-digit) on the pallet label. This “attaches” the driver’s ID to the move. The pickup is date and time stamped. The handheld display on the scanner directs the driver to the destination location. All locations in storage facilities are aisle/tier/bay coded and have bar codes attached to the racking. When the driver arrives at the destination location, the pallet is let down and the storage location tag is scanned to verify and complete the move. The letdown is also date and time stamped.

This process is repeated for all intra- and inter-plant moves. In this way the warehouse management system has real-time, accurate information on the location of every pallet produced and stored. This inventory accuracy has enabled ABC to lower its inventory levels and the associated carrying costs. It has also reduced damage and spoilage costs because of better information on freshness dates and better product rotation.

When taking customer orders, ABC uses only the 14-digit item number for the case, and quantities are expressed in cases. ABC communicates to its customers the information about these products via e-commerce to a third-party common item database (the IFDA database). Because ABC uses the UCC/U.P.C. number for all items, customers and operators are assured of finding ABC’s products. ABC has a means for quickly and easily reaching everyone with the information they need.

One piece of information that is communicated is standard case pack sizes and pallet configurations. This has enabled ABC to “guide” its customers into ordering standard multiples. The most efficient way to move product at ABC is the single-item pallet. ABC worked with its customers to find the best pallet configuration based on the volume and the customer’s racking configurations. This ensures that ABC customers will order in the item pallet configurations as they are produced. This has dramatically reduced case handling at ABC. However, ABC still sells plenty of products in less than pallet quantities.

When an order is received, ABC converts all line item level quantities into standard pallet quantities, and specific pallets in specific locations are allocated to the order to minimize travel time. The remaining cases are grouped into pallet groups based on pallet and case parameters and the pick locations of the cases.

With the order converted to a set of product movements, either full pallet pulls or case selection runs, the system queues the moves into issuing sequence based on the shipping appointment time, via either ABC’s common carrier or customer pickup.

When the order is issued for picking, the system creates an open Advance Ship Notice transaction. Full-pallet pickers move to the directed aisle/bay/tier location, visually verify the pallet completeness and condition, and scan the pallet location, the pallet license plate/serial number and the item number on the pallet tag. An error message is displayed if any of the scanned information does not match the pick order. At this point the inventory location has been relieved of its stock and the location goes on the “vacant list” for immediate use for incoming products.

The picked-up pallet is now registered by serial number to the customer order. The system has also updated the customer order data with the manufacturing lot number of the pallet. The open Advanced Ship Notice is also updated with the pallet’s serial number. The driver is directed to move the pallet either to a shipping bay onto a truck or it is let down in a staging area with other pallets for the same order or other orders consolidated onto the same load.

For items ordered in less than pallet quantities, a custom pallet must be built from the selected cases. These pallets have been “predetermined” by the system, and a pick route is selected to minimize travel time. The fork truck driver picks up a pallet label for each empty pallet to be filled. This pallet label incorporates the same 18-digit number structure (SSCC)

as the number created at the end of the palletizer in the plant. ABC has also designated its distribution centers as “serializing locations” and has assigned each DC a two-digit number like the palletizers.

The picker scans the serial label he is starting to work on, then proceeds through a directed pick route. He stops at each location, scanning the location bar code, the item number of the case selected and any additional information bar coded on the case. For food items this includes lot number, and for variable weight items the weight is scanned. For perishable product a variety of dates may also be scanned. All of this product information is captured in a single “swipe” of the bar code on the case, because the application identifiers enable all this information to be sequenced linearly.

The picker makes every effort in placing cases on the pallet to minimize hidden cases and ensure that case labels face out.

At each location, the case is scanned out of its inventory location and onto the pallet. If, based on inventory records, and this is the last case in this location, a message is sent to the picker to verify whether the location is really empty. If it is not, it is flagged for an inventory control audit and adjustment. Conversely, if the location is empty, the picker indicates this regardless of the message. If this does not match inventory records, the location is put on the “vacant list” and an inventory control audit and adjustment action is noted. These controls keep ABC inventory accurate at all times.

When a pallet is finished it is shrink-wrapped to ensure its integrity, and the pallet label is affixed. It is then moved to the designated letdown location (either live load onto a truck or to a specific staging position). This completes this pallet and registers its serial number and the contents (case item numbers, quantities, variable weights and lot numbers) to the open advanced ship notice and ABC customer order management system.

#### SUCCESSFUL PRACTICES CHECKLIST

- |  |     |    |
|--|-----|----|
| 23. Use single-item pallet serial number in fulfillment process? | Yes | No |
| 24. Create serial pallet ID for all mixed item pallets?          | Yes | No |

When the order is completed (all pallets selected and serial numbers “registered” to the open ASN), the order is flagged as complete to ship. The pallet license plates for the single-item standard pallets are the same as those applied at the palletizer. The new pallet labels created are for the mixed item or non-standard pallets that are created at time of selection. When the order is actually sealed into the truck, the load ID (Pro Number) is captured and the Advance Ship Notice EDI transaction is released to the recipient.

#### SUCCESSFUL PRACTICES CHECKLIST

25. Use Advance Ship Notice (ASN) EDI transaction?	Yes	No
26. Tie pallet license plate numbers to ASN?	Yes	No
27. ASN reflects actual shipment items & quantities?	Yes	No
28. ASN transmitted to be received in advance of receipt of product?	Yes	No

This operation has significantly reduced the labor content in the order fulfillment areas at ABC. Inventory accuracy has been improved to the point that ABC’s auditors no longer require complete physical counts. Mis-ships (shipping the wrong item) and short-ships (unexpected out of stocks that are cut from the order at time of selection), and lost and orphan case time have almost disappeared.

ABC customers are delighted. Orders are complete and accurate. Product is fresh and there is less spoilage. For those who are EDI capable, ordering and receiving is a breeze. Invoice errors have been slashed. The ASN enables customers to automatically update their inventory system when a shipment arrives. And the bar codes on the pallets and cases make the check-in of the shipment fast, easy and efficient. Scannable weights on variable weight cases and important dating information have made weighing or keying data from these cases unnecessary.

Finally, ABC has greatly reduced its financial risk. The use of standard product identification and bar codes has created a tight control system. Many of these products contain ingredients that are severe allergens to a small percentage of the population. The U.P.C. number has helped put into place tight controls on ingredients and ingredient labels on packaged items.

#### SUCCESSFUL PRACTICES CHECKLIST

- |   |     |    |
|---|-----|----|
| 29. Tie lot numbers to all cases on an order? | Yes | No |
| 30. Conduct mock recall drills?               | Yes | No |
- 

Many of the types of products that ABC produces are susceptible to food-borne illness. By incorporating end-to-end lot tracking that ties raw material ingredient lots to manufacturing lots, and manufacturing lots to customer orders, ABC can, at a moment's notice, determine where every case of a lot is or has gone. Recall drills have been honed to less than 60 minutes. ABC also encourages its customers to institute a lot tracking mechanism that takes advantage of the information that ABC provides on its cases via bar codes and in electronic commerce transactions. Its goal is an unbroken tracking chain throughout the entire supply chain. ABC has done everything that it can do for itself and to enable its customers to do all they can do.

A-to-Z Inc. is a \$500 million distributor of a broad line of food and non-food items sold and delivered to thousands of foodservice operators. Operator customers range from single-site, sole proprietorships to multi-regional chains of restaurants that share the same menu. A-to-Z's customers run the gamut in terms of cuisine, concepts, volume and price points. To meet the broad and varied needs of its customers, A-to-Z carries over 30,000 items at any given time. New items come and old ones go at a rate of hundreds per year. Products are sold via A-to-Z's professional sales staff numbering in the hundreds across all the regions it serves.

A-to-Z ships 20 million cases a year to its operator customers from five distribution centers that operate semi-autonomously within their respective regions. While A-to-Z is not national in scope, it does cover a major portion of the U.S. geography. Each DC is capable of handling dry (food and nonfood), chilled and frozen products. Each also operates a fleet of delivery vehicles, including tractors, trailers (multiple sizes) and route trucks. Every day these trucks run hundreds of routes delivering thousands of cases of products.

A-to-Z buys from hundreds of manufacturers, producers and processors of foodservice products. It operates its own dairy and ice cream plant. The dairy products produced there carry the A-to-Z label, as do hundreds of other products for which A-to-Z has contracted production to a small group of supplier partners. Products are received and shipped in a variety of case types requiring varying levels of temperature conditioning. These include:

- Dry, standard weight cases (nonfood)
- Dry, standard weight cases-(food – requiring lot tracking)
- Chilled, variable-weight/perishable (short-life) cases
- Frozen, variable-weight/perishable cases
- Frozen, standard-weight/perishable cases
- Dry, mixed item cases based on individual operator orders
- Individual packaged units (bottles, cans, bags, etc.)

## ***Appendix B: Distributor Successful Practices***

Product is received in single-item cases on standard single-item pallets (standard tie and high) and on mixed-item pallets that are built based on the items and quantities A-to-Z orders in. Product is delivered by the vendors' common carrier and increasingly on A-to-Z trucks as they back-haul to increase their transportation asset utilization and reduce the cost of delivery.

Prepared food sales to consumers continue to grow in the regions A-to-Z serves. The mix of operators in A-to-Z's market is churning at a faster rate than ever. New restaurants are opening every day. By the same token, every day also sees some of A-to-Z's customers close their doors. The net number of operator customers is growing, and so is A-to-Z's sales and transaction volumes.

But while sales grow, so does the competition. A-to-Z competes with no fewer than 50 companies in its total market. While acquisitions and consolidations in the competitive landscape have dramatically reduced this number in the past few years, it has not diminished the ferocity of competition. On the contrary, large competing distributors have volumes that bring economies of scale and a purchasing power far greater than A-to-Z's. Small and niche competitors can offer personalized and specialized service that A-to-Z cannot match. Like it or not, A-to-Z's customers evaluate almost every purchase and compare it with the offerings of one to three of A-to-Z's competitors. It is a daily fight to retain each account and remain competitive.

Another factor weighing heavily on A-to-Z executive management is food safety. The public eye (and, consequently, the regulatory eye) has, in recent years, focused on the safety of the prepared food supply chain. A series of incidents of food-borne illness, allergic reactions and contamination have in some cases caused widespread illness and even death. A-to-Z has had some close brushes but never has been involved in any of these cases.

However, there have been instances in recent years in which A-to-Z's suppliers have notified them that certain cases of items in specific lots need to be recalled. This has put the burden of liability on A-to-Z to find the remaining cases, either on A-to-Z premises or those of its customers. While the tasks have been completed, it was an administrative nightmare, costly, and took longer than it should have. Every hour that elapses increases the risk that a consumer will experience a problem. A-to-Z executives want to close the gap that exists and limit the risks and liabilities that these situations represent.

Another compelling force driving A-to-Z management was the desire to become more efficient and, thus, more competitive. A tactic that addressed both this issue and food safety was an efficiency initiative involving standard product identification and bar coding in each of the five DCs the company operates. The result was a dramatic gain in operating efficiencies that continue to provide fundamentally new ways of dealing with suppliers and, surprisingly, a competitive advantage. The implementation of standard product identification and bar code technology has also enabled A-to-Z to offer a number of value-added services to its customers. These, management believes, will strengthen its competitive edge into the future.

In the past, each of five regions had its own purchasing function and means of identifying its products. This system of product identification evolved as A-to-Z's five DCs were formed from five independent business entities. Independent DCs continued to work well until A-to-Z's chain customers began to span multiple regions, forcing some coordination in item numbering across DCs. For the first time, A-to-Z's "houses" were forced to work together in the way products were numbered and described to these chain customers.

In recent years, a corporate purchasing function had been established to consolidate purchasing power for items stocked across all houses. While A-to-Z had been able to lower its cost of goods, the process of consolidating the volumes of items and vendors from the five separate regional operations had become an administrative nightmare. Each of the five operations could potentially carry the same item from the same vendor but use a different item and vendor number when recording activity for the item. Matching these common items and crosschecking the results was the primary activity of the corporate purchasing staff.

The bar code efficiency initiative finally forced A-to-Z management to deal with this nagging problem. In the early planning stages, the team that had been put together to understand how bar codes could increase DC operating efficiency was largely composed of logistics, warehouse and IT personnel. Their preliminary plan revolved around the A-to-Z item number to be encoded in bar code fashion, printed on self-adhesive labels and placed on each case shipped. This would perpetuate the use of the five semi-separate legacy item numbering schemes employed across A-to-Z. With the time at hand to select a bar code language to be used for the labels, the team was about to adopt a common language designed for companies' internal use called Code 39.

It was at this point in the process when A-to-Z's VP of Purchasing and VP of Logistics went to an industry conference about Efficient Foodservice Response (EFR). There they learned that the industry as a whole was addressing many of the same inefficiencies that were A-to-Z's concern. Voluntary standard product identification and bar codes were positioned as the cornerstone of the entire initiative. This got A-to-Z's attention, and it decided to send its entire bar code team to an EFR Bar Code Workshop to learn as much as they could to accelerate their progress.

What they learned had a dramatic impact on the final program and multiplied the gains that were achieved many times over. First, A-to-Z dropped its plans to use the proprietary Code 39 bar coding design. Instead, it opted to follow industry successful practices and use a combination of bar code languages (or symbologies). For individual units of product, A-to-Z would rely on the UCC-12 bar code. For cases, it would use both the Interleaved 2 of 5 (I 2/5) and the larger character set UCC/EAN-128 language. This latter bar code language would also be used at the pallet level. Since the scanning technology that it planned to employ is "auto-discriminating," one scanner can distinguish and read all three bar code languages.

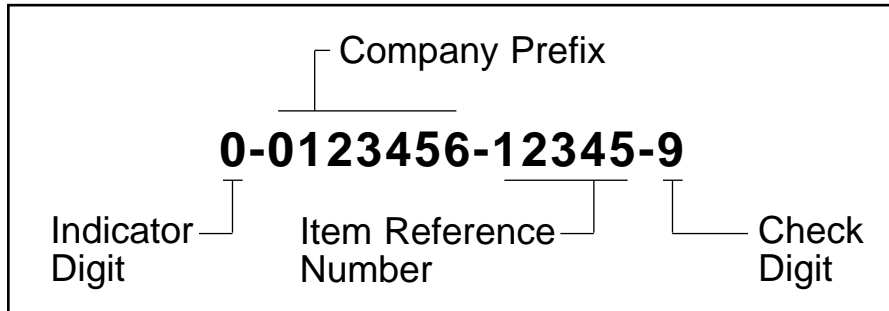
Next, the team tackled the item numbering issue. A-to-Z management considered the most complex aspect of the implementation project (and one with far-reaching impact) to be figuring out what numbers to turn into bar codes. The decision was to move to a standard means of identifying products both within A-to-Z, to customers and with suppliers. A-to-Z found that by incorporating an industry standard numbering system it could turbo-charge the efficiencies gained by bar coding.

Historically, each of the A-to-Z houses assigned a four- to seven-digit number to identify suppliers and a four- to eight-digit number to identify items. There was no shared standard across the houses. Through its investigation of EFR and subsequently from documents obtained from the Uniform Code Council, A-to-Z learned that a 14-digit standard existed for numbering products. This was no secret to corporate purchasing since these UCC codes had been one means they had used to consolidate data from the five houses.

After a series of long and passionate debates, A-to-Z executives agreed that all five houses would work together to implement a one-numbering system philosophy. This numbering scheme would include a 14-digit item number and a seven-digit manufacturer ID. Further, this internal vendor and item-numbering scheme would integrate the industry successful practices guidelines for use of the U.P.C. number. It also required

A-to-Z to acquire its own unique UCC Company Prefix Number from the Uniform Code Council for the dairy products it produced and the A-to-Z labeled products whose production it contracted.

The adopted long-term structure for product identification is shown below:



A-to-Z chose this scheme because it is the industry-wide standard and extends the one-number philosophy not only across A-to-Z's five houses but also potentially across all its suppliers and customers as well. The use of this number in a perfect world would mean that all internal and external communication and transactions would be with one number for each item. A-to-Z could avoid the confusion created when a customer refers to an item by the customer's number, which needs to be cross-referenced with up to five numbers for the same item across each of the houses (and potentially another number used by the supplier). Errors in maintaining these cross-references and in translations are one of the primary causes of item refusals by A-to-Z customers. This practice also made volume and rebate tracking and control by the corporate purchasing department very inefficient, and A-to-Z believed that it was leaving a significant amount of money on the table.

In this perfect world, when A-to-Z decides to pick up a vendor and items from the vendor's assortment, the vendor provides a UCC Company Prefix Number guaranteed to not be duplicated across all of A-to-Z's suppliers and the 14-digit item number for each packaged item, case and (potentially) pallet. These numbers will be used as the primary means of item identification, as the "keys" in A-to-Z item master records and in any application that references items. Further, each pallet A-to-Z receives from its suppliers would be uniquely identified with a serial license plate number that A-to-Z could continue to use for tracking that pallet internally.

However, to A-to-Z's chagrin, an audit of approximately 30,000 items that it stocks revealed that about 40 percent of the cases have the UCC 14-digit GTIN and the associated bar code on the case. And not all of these bar codes can be accurately scanned on a consistent basis. Virtually none of A-to-Z's suppliers actually encoded the necessary lot number and dating information on the cases or provided standard pallet identification.

At this point, A-to-Z had reached a crucial decision point in the development of its initiative. The key question was: "Do we proceed to develop an internal program that does not require the vendor 'perfect world,' or do we wait until vendors become compliant?" A-to-Z management knew that the efficiency gains and recall tracking were imperatives that could not wait. They also knew that to develop an internal proprietary system could potentially put them at a disadvantage if the perfect world ever materialized.

The conclusion was to go ahead with the "perfect world plan," as it became known, with "patches" to the holes created by non-UCC compliant suppliers. This enabled A-to-Z to move forward, realize efficiency gains, take advantage of the 40 percent of items that are compliant and increase the gains as more vendors become compliant. This strategy was key to A-to-Z's success. It was also coupled with the development of a vendor communication program and "how to" guide to doing business with A-to-Z. This enabled A-to-Z to move forward and manage the transition to the perfect world.

Suppliers provide the item number and case number to A-to-Z. These are the same codes the supplier uses in dealing directly with the operators who are the distributor's customers. The supplier also recommended that A-to-Z become a UCC compliant vendor. Because of its dairy plants and branded products, A-to-Z also had to look at itself as a manufacturer as well as a distributor. (See "Supplier Best Practices" to see how A-to-Z would approach these issues from a manufacturer's perspective.)

Using the GTIN, a link is established across master records that tie units coded with the U.P.C. to the case-pack they are received in. All item master data, nutrition data, contents, etc., are received electronically from third-party electronic catalogs using standard data templates. These templates are set up to automatically map to internal data fields within the distributor's master item data records. For items received without the UCC/U.P.C. internal number, A-to-Z assigns an internally defined "pseudo" vendor number. This number uniquely defines the vendor internally

to the distributor. Then a sequentially assigned item number and modulo-10 check digit are assigned to create “pseudo” U.P.C. codes. Check digits enable scan accuracy, piggy-backing on logic built into U.P.C. codes.

Shipments or items received from a UCC compliant supplier have the following characteristics:

#### Pallets

- SSCC serial number + bar-coded in UCC/EAN-128
  - If single item pallet:
    - Number of cases (in English)
    - EAN/UCC-14 digit item number + bar-coded using UCC/EAN-128
    - Application identifiers + bar-coding in UCC/EAN-128
      - Lot Number
      - Use-by Date

#### Generic standard weight dry product

- ITF-14 case code + encoded with I 2/5 bar code printed directly on corrugate case with scannable quality

#### Traceable standard weight dry product

- EAN/UCC-14 case code + encoded with UCC/EAN-128
- Application Identifiers + bar-coding in UCC/EAN-128
  - Lot Number
  - Use-by Date
- Printed on a label that is affixed to the corrugate case

#### Catch weight and/or perishable product (Dry, Chilled, Frozen)

- EAN/UCC-14 case code + encoded with UCC/EAN-128
- Application Identifiers + bar-coding in UCC/EAN-128
  - Lot Number
  - Use-by Date
  - Net Weight of Contents
- Printed on a label that is affixed to the corrugate case and able to withstand damp/chill/freezer conditions.

When shipments are received from vendors not using standard product identification and bar coding, A-to-Z applies the standard labeling using the pseudo manufacturer ID number. As vendors begin using standard product ID and bar codes, this labeling operation is simply replaced by the vendor's labels. This enables A-to-Z to incrementally lower its costs and efficiencies with each additional vendor.

In addition, A-to-Z wanted to be able to uniquely track each pallet through its warehouse system. For this purpose, an 18-digit serial license plate number is assigned to each pallet as it is created. The structure of this number is identical to the 14-digit item number except that item number field is replaced with serial number that is automatically incremented by the system for each pallet constructed.

At A-to-Z all product movements capture date, time, person, pickup location and destination location. In addition, all moves are directed; that is, the pickup and destination locations are system determined. Production runs are scheduled to fulfill target inventory requirements at specific locations. This targets the facility the product will be moved to. The system also keeps track of vacant storage locations to "know" where product can be moved.

A fork-lift driver scans the serial number (18-digit) on the pallet label. This initiates the move and the driver's ID is attached to the move. The move is then date and time stamped. The handheld display on the scanner directs the driver to the destination location. All locations in storage facilities are aisle/tier/bay coded and have bar codes attached to the racking. When the driver arrives at the destination location, the pallet is let down and the storage location tag is scanned to verify and complete the move. In this way, the warehouse management system has real-time, accurate information on the location of every pallet produced.

The business results achieved by A-to-Z have been incredible. In its distribution facilities, worker productivity is up 15 percent. With the positive, real-time tracking of inventory as it moves through the facilities, inventory accuracy has improved dramatically, so much so that the number of physical inventories have been cut in half. This has led to fewer "process failures" such as mispicks, shorts and refused or returned cases. Cases that are returned can now be processed with much less labor.

An active lot tracking system has also been implemented. Now A-to-Z can be assured that if a market withdrawal is necessary, it has the accurate information needed to locate the remaining affected cases (internally or the ship-to + contact) within minutes and can “control” the cases within four hours. Mock withdrawals are conducted occasionally on a random basis to keep the process honed.

Customers are happy, too. They now have the information they need on the cases they receive from A-to-Z to manage inventory. Using standard product identification on the cases enables customers to efficiently communicate their orders to A-to-Z. With the product rotation dates and the lot tracking system, they are also assured that the product they receive from A-to-Z is fresh and safe. Deliveries are made more quickly, and they produce fewer discrepancies between operator orders, bills of lading and invoices. With this new ease of doing business, A-to-Z has received fewer customer complaints and there are fewer defections to the competition.

The frustration of the purchasing departments has turned to glee. Now they can quickly and easily integrate the product movement data from all divisions using the standard product identification. This has allowed them to create product tracking and usage reports in minutes, and dramatically improved their ability to communicate with vendors and the distributor group to which they belong. The economies of scale have enabled them to significantly reduce the cost of goods sold.

Finally, this data has enabled the creation of a category management team that has been able to reduce the number of items carried across the corporation by 10 percent without missing a sale. The team has just gotten started, and they feel that they can remove another 10 percent of the items within the next 12 months.



## **Appendix C:** **Glossary of Terms**

**activity based costing (ABC)** – an accounting method that identifies the costs of individual product processes and activities, enabling a business to understand more effectively how and where it makes a profit.

**activity based management (ABM)** – the process of using ABC to align revenues and costs to business processes and activities.

**advance ship notice (ASN)** – see ship notice/manifest.

**application identifier (AI)** – 2 to 4 numbers used to indicate supplemental information found in the UCC/EAN-128 bar code symbol. AIs are generally used as secondary codes to provide information not included in standard U.P.C. 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 most numbering schemes. This is a common method used to ensure the numbers that precede the check digit are indeed the correct numbers.

**continuous replenishment (CRP)** – the practice of partnering between distribution channel members that changes the traditional replenishment process from distributor-generated purchase orders based on economic order quantities to the replenishment of products based on actual and forecasted product demand.

**EAN-13** - the numbering scheme 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 UCC and EAN coding system that includes the GTIN data structure with the EAN-8, EAN-13, UPC-A, UPC-E, ITF-14 and UCC/EAN-128 symbologies.

**Efficient Consumer Response (ECR)** - a strategy in which the members of the grocery supply chain study methods to eliminate non-value-added costs from the supply chain and bring value to the consumer.

**Efficient Foodservice Response (EFR)** – a strategy in which the members of the foodservice supply chain study methods to eliminate non-value-added costs from the supply chain and bring value to the consumer.

**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.

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

**GTIN (Global Trade Item Number)** - A 14-digit number in the EAN/UCC system that uniquely identifies a product or service worldwide.

**guard bars** - the bars and spaces on a U.P.C. bar code symbol that help separate the different components of the number encoded in the bar code.

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

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

**numbering scheme** - the number and composition of digits used to identify a product.

**packager code** - used with the Random Weight U.P.C. to identify who packaged the item.

**Indicator** - found in the EAN/UCC-14 numbering scheme traditionally used to identify what level of packaging is being identified and whether the items inside the container all have the same U.P.C. number.

**extension digit** - found in the SSCC numbering scheme used to extend the capacity of the SSCC.

**random weight** - items that are not fixed in weight and vary from package to package or case to case.

**Serial Shipping Container Code (SSCC)** - a numbering scheme that is 18 digits in length and is typically used for pallet identification.

**Ship Notice/Manifest** – an EDI transaction in which the shipper advises the customer of a pending shipment, what is in the shipment and when it will arrive. Generically, this is known as advance ship notice or ASN. The transaction enables the customer to identify short shipments before receipt and plan warehouse receiving more efficiently.

**Shipping Container Code (EAN/UCC-14)** - a numbering scheme that is 14 digits in length and is typically used for case identification.

**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 Case Code** - see Shipping Container Code.

**UCC/EAN-128** – a bar code symbology and data format used for primary and secondary product identification.

**Uniform Code Council (UCC)** – the nonprofit numbering organization that helps create standards for supply chain management practices for multiple industries in the U.S.

**Universal Product Code (U.P.C.)** – a numbering and bar coding system for product identification of consumer items, typically scanned at the retail point-of-sale.

**UCC-12**- the bar code symbol used to encode the U.P.C. number.



## ***Appendix D: Other Resources***

### **STANDARD PRODUCT IDENTIFICATION MANUALS:**

- ANSI/UCC6-1996: Application Standard for Shipping Container Codes (available from the Uniform Code Council)
- U.P.C. Guidelines Manual (available from the Uniform Code Council)
- ANSI/UCC4-1995: UCC/EAN-128 Application Identifier Standards (available from the Uniform Code Council)

### **BAR CODE SYMBOL MANUALS:**

- ANSI/UCC5-1995: Quality Specification for the U.P.C. Printed Symbol (available from the Uniform Code Council)
- ANSI/UCC6-1996: Application Standard for Shipping Container Codes (available from the Uniform Code Council)
- UCC Guidelines for Producing Quality Symbols (available from the Uniform Code Council)
- Guidelines for Providers of EAN/UPC Symbol Design Software (available from the Uniform Code Council)
- ANSI/UCC4-1995: UCC/EAN-128 Application Identifier Standard (available from the Uniform Code Council)
- U.P.C. Symbol Location Guidelines Manual (available from the Uniform Code Council)
- U.P.C. Film Master Verification Manual (available from the Uniform Code Council)
- U.P.C. Coupon Code Guidelines Manual (available from the Uniform Code Council)
- ANSI/UCC1-1995: U.P.C. Symbol Specification Manual (available from the Uniform Code Council)
- 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)

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International Foodservice Distributors Association/  
Food Distributors International  
(IFDA/FDI)



International Foodservice Manufacturers Association  
(IFMA)



Uniform Code Council  
(UCC)



Association of Sales & Marketing Companies — Foodservice  
(IFBA/ASMC)



National Restaurant Association  
(NRA)



Canadian Council of Grocery Distributors  
(CCGD)

