Full Traceability For The European Fruit & Vegetable Supply Chain

DATAMAX

An Achievable Goal...

Consumer demand is at an all time high for fresh produce and minimally processed fruits, vegetables and salads. Produce from almost every country is now available at the local supermarket, thanks to trade laws, deregulation and sophisticated logistics systems. While this is a favorable situation for consumers and suppliers, the reality is that as the supply and demand for fruits and vegetables increases, so will the risk for microbial pathogens and GMO contamination of produce, as well as bio-terrorist threats to the food supply.

Europe's Fruit & Vegetable industry is actively addressing these public health concerns with decisive steps. The European Article Numbering (EAN) Association, industry organizations, and government agencies have called for a collaborative and cooperative effort among all players in the food supply industry to apply EAN.UCC standards for product labeling at all points in the supply chain. For the Fruit & Vegetable industry, this would include the grower/packer, shipper/logistics, and retailer levels. The targeted objectives are to:

> Implement controls that can trace back from the consumer product to the cause of the safety problem.

> Quickly identify, locate and recall the actual products affected.

Modern technology will play a critical role in achieving these objectives.

In fact, technology vendors will need to be more than just suppliers to the industry; indeed, they will need to be fully participatory partners who can keep abreast of market trends and industry issues. There is no way around the fact that implementing full traceability technology is initially expensive. Therefore, technology solutions will need to be highly flexible and not become obsolete in a matter of just a few years.

This white paper will discuss how bar code technology is a key factor in the success of full tracking and traceability at all points in the food supply chain. Although this paper focuses primarily on Europe's Fruit & Vegetable industry, the fundamental points can actually apply to almost any market in the Food industry. This paper will cover:

1) Issues that are driving food traceability.
2) Bar code labeling practices at every point in the supply chain.
3) Implementing best bar code technology practices.

A Worldwide Standard For Food Traceability

To date, the European Fruit & Vegetable industry has been more receptive to common label requirements in the supply chain than its U.S. counterparts. The successful outcome of bar code standardization in Europe will play a crucial role in the U.S. and other countries' acceptance of similar guidelines. As global trade continues to expand, it is critical that all countries work together to provide a common method of supply chain traceability and tracking.

In 1977, the European Article Numbering (EAN) Association was formed for the purpose of creating the EAN.UCC System, a code based on the U.S. UPC bar code. The EAN.UCC system provides for the standardization of bar codes, EDI transactions sets, XML schemas, and other supply chain solutions across all industries, and is based on 13 numbers (the U.S. UPC bar code is based on 12 numbers). Today, the EAN is playing an active role along with the Food industry to implement sound tracking and tracing procedures at all points of the supply chain. Clearly, the EAN believes bar code technology is crucial to the success of this objective, and along with other international organizations, has called for a January 1, 2005 deadline for all bar code scanners and software to recognize the expansion of bar codes to the EAN.UCC 13 digits standard.

The Key Issues

Food safety is a global concern. Growing public awareness of potential dangers from microbial and GMO contamination and bio-terrorist threats have resulted in the demand for common labeling standards.

GMO (Genetically Modified Organism) Contamination
European consumers have such an aversion to GMO food that they have given it the nickname, "Frankenfood!" This is an issue under considerable debate, because scientific studies have not conclusively proven that GMO foods are necessarily dangerous. However, many environmental groups maintain that GMO foods can wreak environmental havoc on the food chain, and have far-reaching consequences. At any rate, the majority of European consumers shun the idea of eating GMO food, and their fears have spurred the European government to enact the strictest regulations on biotech food.

Here is an example of how expensive a GMO recall can be: In 1997, the Monsanto Company had to recall canola seeds suspected of GMO contamination. Although the genes were detected before going to market, they were still not discovered until after having been packed and put into the quality control phase. 60,000 bags, or the equivalent of 600,000 acres of the seed, had to be recalled.

Food-borne Illnesses
Dangerous pathogens can certainly be present in fruits & vegetables, unpasteurized fruit juice, and other processed fruit and vegetable foods, and if not detected soon enough, can pose a serious threat to public health.

In April 2002, an outbreak of Hepatitis A in New Zealand was linked to fresh blueberries grown at a Waikato farm. Almost thirty people were infected with the virus. New Zealand's Director General of Health issued an alert advising people who had purchased the blueberries to discard or thoroughly cook the berries, since freezing does not destroy the virus.

In 1996, an outbreak of Escherichia coli O157:H7 in Japan affected over 6,300 school children, resulting in two deaths.

These are just a few examples of costly product recalls, and there are many more. The key point to remember is this: The farther a product is out in the supply chain, the more it will cost to recall it - in both dollars and public safety.

Bio-terrorist Threats
As a result of events in recent years, government agencies and food suppliers are giving serious thought and planning to the possibility of a biological terrorist attack on major crops. Without a doubt, the outcome of such an event would cause massive environmental and economic harm. Certainly vigorous security and surveillance practices are the keys to avoiding such an event, but should it ever occur, sound tracking and reporting technology are crucial in quickly preventing greater damage.

A Logical Solution: Bar code labeling at all points in the supply chain.

Bar code labeling is globally recognized as a fundamental technology that, when put into practice by all participants in the supply chain, is a highly efficient traceability system that can pinpoint the origin of the problem to a specific region, logistics, processing or packing facility, group of producers/growers, or individual producer/grower. The following is a brief overview of bar code labelling practices at various points in the supply chain.

Producer/Farmer:
Although bar code labelling at the shipping and retail points are more commonly discussed, putting bar code labels to work at the first stage of the supply chain can be the single most important step in tracing a product back to its origins. It is also the first step in creating a fully responsive supply chain, from the retailer's perspective.

When producers ship their produce by separate lots to different collection points, such as the facility that will pack or ship the produce, they attach a unique ID bar code, called a "distribution label," to each lot being shipped. Country of origin labels are also affixed at this point in the supply chain, and the Global Trade Item Number (GTIN) is assigned. (However, if the supplier is providing a product available only to a specific customer, the customer may then be the entity that assigns the GTIN).

Logistics:
Packers and shippers play a key role in identifying products as they move through the logistics process. The Serial Shipping Container Code (SSCC) is used by all parties in the packaging supply chain as a reference number, and contains no classifying elements. The user assigns an extension digit according to internal needs; a company prefix requires allocation by a national EAN organization.

The EAN.UCC Logistics Label is also assigned at this point. This is largely used to identify pallets, uniquely identifying each one with information about the unit, or its contents, along with manufacturer and customer information that is machine readable. It usually includes batch, article and count numbers.

Finally, the EAN.UCC Global Location Number is applied at the logistics level in the supply chain. This is a numeric code that identifies key locations within a business or organization. By affixing Global Location numbers to units, all parties involved in transactions can be identified including buyers, suppliers, place of delivery, and place of departure.

Retail:
Bar coding at the retail point in the supply chain is the heart of inventory management. Retailers use the EAN.UCC numbers to tag and easily track sales of products. This is vital information in the event of a product recall. It also provides retailers with the means to track consumer buying trends, and execute "smart" inventory practices.

The following is a sample scenario of how bar code labeling is used in every point in the supply chain.

A customer purchases a bag of lettuce in the produce department of a large grocery store, and unfortunately, becomes ill afterwards. It is determined that the customer has contracted a food-borne illness, most likely from the purchased lettuce. The customer has saved the bag the lettuce came in and/or the receipt. The store's manager is able to scan the bar code from the bag of lettuce and instantly retrieve all of the information needed to quickly determine where the lettuce came from.

Information available from retail point	Information available from shipping/logistics point	Information available from farm/producer point
Product ID# Shipper & shipping dock Pallet Number Best-by Date Producer/Grower Lot Number Country of Origin	Shipper & shipping dock Shipping Date Pallet Number Best-by Date Producer/Grower Lot Number Country of Origin	Producer/Grower Lot Number Country of Origin Pick/Packing Date

Of course, it would have been ideal if the food pathogen had been detected at a quality assurance station somewhere at the producer point. However, food pathogens can be passed from humans handling the produce, and in this case, it is likely that the produce was contaminated at the packing/shipping point. *Since the bar code contains information about what dock and/or department the produce was handled at, officials can more quickly determine where the point of contamination occurred, and perform the necessary testing at the suspected location.*

Bar code Best Practices:

Clearly, bar code technology provides the means at any point in the supply chain to determine where the product came from, and where it went. But there are inherent challenges to implementing bar code technology in the perishable foods industry. Therefore, it is essential that the technology must:

> Be based on global standards.
> Have the capability to integrate with new technologies as they emerge.
> Work with existing product line processes.
> Withstand the extreme temperatures and humidity levels common in the perishable foods industry.

Global Standards: While software, scanners, and labels are available from a variety of suppliers, a uniform system of labeling is critical to the success of rapid traceability in the entire food supply chain. Any supplier hoping to expand its business globally will need to implement this system and the accompanying technology - or get left behind.

Integration with emerging technologies: Technology always has and always will continue to evolve. This often means that as soon as a large-scale computer system is put into place, a newer technology comes along that makes it obsolete. Not even the biggest enterprises can repeatedly afford to replace operating systems with newer ones that adapt to the most recent bar code, wireless, and software applications.

Therefore, it is important for businesses to make sure they purchase innovative bar code hardware that comes with flexible connectivity options, like the Datamax Class printers, that are compatible with virtually any operating system.

Working with, not disrupting, the production line: Typically, the bar code station found at various points in the production line includes a bar code scanner, label printer, and PC to run the printer and the database application. Legacy printers are often bulky, difficult to move, and slow in output; PCs often take up the amount of room that could have been allotted to one or more workers on the production line. PCs also require extra maintenance from IT departments; time that could be more productively used elsewhere.

New innovations in bar code technology can prevent these problems and free up space in the production line. Datamax MCL-enabled intelligent printers eliminate the need for PCs. The Datamax printers also offer a wide range of connectivity options, allowing the printers to operate in a wired or wireless environment. They are also extremely durable and produce high output - a must for any packer and/or shipper needing to print labels on demand for each production run.

Compatibility with the perishable foods environment: All points in the food supply chain require durable bar code labels and equipment that can withstand extreme humidity and temperature levels. It is important to pick a vendor that offers a wide array of labels and ribbons that can meet the compliancy standards of the largest retailers in the perishable foods industry. Whether the company needs thermal transfer labels for compliance labeling, or special adhesive labels that can withstand the harshest environments, Datamax carries virtually every modern bar code label.

Conclusion

Strict controls, industry compliance, and bar code technology all play key roles in the objective to create a common traceability standard at every point in the food supply chain. Every supplier, no matter its size, will need to implement all three factors in their business processes, or get left behind.

We live in a time where the food supply chain is truly a global one. Never before have consumers had so many choices in the food they eat - or concerns. By working together with other suppliers, industry organizations, and technology vendors, the entire Food Supply Chain will benefit from increased public trust in the food supply, and economic benefits from business conducted on a worldwide level.

About Datamax:
Since 1977, Datamax has pioneered numerous advances in bar code technology, resulting in some of the industry's most innovative and reliable products. Many of those breakthroughs in technology are now patented.

Based in Orlando, Florida, with international representative offices, Datamax is an ISO 9001 registered company, a certification that promises rigid quality standards. Clients include government agencies and many of the world's largest companies, serving a wide spectrum of industries, including retail, manufacturing, agriculture, automotive, healthcare, and ticketing. Datamax products are sold through an exclusive reseller network serving over 100 countries.

Datamax is proud of its industry affiliations with EPCglobal, the Association for Automatic Identification and Mobility (AIM), the International Ticketing Association (INTIX), and the Automotive Industry Action Group (AIAG).

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