ENSURING FOOD SAFETY AND BRAND PROTECTION THROUGH SUPPLY CHAIN TRACEABILITY

To ensure the safety of the domestic and global food supply, government regulations and brand protection demands from customers are on the rise. To address these growing requirements, food processors up and down the supply chain now find that automated traceability systems are a virtual necessity. For many food processors, their current challenge is to identify an automated approach to traceability that is both cost-effective and a good fit for their current business operations.
Introduction

On June 30, 2002 the U.S. Department of Agriculture's Food Safety and Inspection Service (USDA FSIS) announced that the ConAgra Beef Company had voluntarily recalled 354,200 pounds of ground beef products that may have been contaminated with E. coli bacteria. Twenty days later, at the request of the USDA, the scope of the recall was expanded to 19 million pounds; an increase of over 5,000%. USDA Officials said they did not want to risk underestimating the quantity of meat that could be tainted and stored in freezers. Because it would take days to trace all the recalled meat, ConAgra could not name the stores that bought the meat or the brands under which it was sold.

The immediate financial impact of this event was dwarfed by the subsequent changes it caused in the marketplace. With a badly tarnished brand image, retail clients quickly dropped ConAgra product lines, and ultimately, the company was forced to exit the beef-slaughter business.

This event elicited a wide range of opinions such as those focused on the need for increasing public safety, to those focused on the broad powers of regulatory agencies, to those focused on the increasing business risks faced by food processors. ConAgra's downfall also highlighted several facts that hold true for all food processors today:

- In addition to the scrutiny of regulatory agencies, the expectations and demands of the supply chain, ranging from immediate customers to final consumers, present many significant risks for food processors.
- To minimize these risks, food processors must be able to produce detailed and accurate records that identify the disposition of products. By using these records to quickly contain the scope of a recall, food processors can demonstrate that they are "in control" and prevent a run-away scenario.

The FDA is not Your Customer

In the past two years, regulatory pressures have risen to unprecedented levels forcing food processors to scramble in search of automated solutions for traceability. In their haste to address new government regulations, many processors have struggled to remain focused on the quality assurance and brand protection requirements of their customers. In fact, both regulatory mandates and customer requirements must be addressed to minimize the risks for a food processor. A compliance issue with the FDA or USDA usually starts with a warning. The failure of a mock recall performed for a customer can result in the loss of that customer, with no warning at all.

Is Traceability Nothing More Than Overhead?

Many processors view traceability solutions in the same way they view insurance policies -- as nothing more than overhead on the business. However, for forward-thinking companies, traceability is treated not as a side-line requirement, but rather, as an integral part of their end-to-end operation, from suppliers to customers. Their traceability solutions are used not only to track product, but also to streamline schedules, reduce operating costs, and improve customer service. Rather than piling on more overhead costs, these solutions are leveraged to increase profits.
This paper examines the regulatory requirements and prevailing customer expectations in the food industries today. Several different approaches to managing these regulations and expectations are compared, and case studies from a variety of food processors are included.

As a result of the terrorist attacks on September 11, 2001, government-imposed regulations are on the rise for food processors in most of the major economies around the world. What had been treated as voluntary practices in food safety and traceability, are now becoming mandatory. While the primary intent of these regulations is to enable rapid containment in the event of an intentional contamination of the food supply, the regulations apply equally in the case of accidental contamination.

A common requirement at the core of these regulations is often stated as “One-Up, One-Back Traceability”. This embodies two basic expectations of the food processor:

- **Trace-Back**: For all products intended for human consumption, the processor must maintain the source identity of all the ingredients contained in that product.
- **Trace-Forward**: For all ingredients received, the processor must be able to identify the disposition of the ingredients in all intermediate and finished products.

For many food plants that have multiple steps in their production process (often involving the mixing and blending of batches and the economical use of scrap, rework, co-products and by-products), this “simple” one-up/one-back requirement poses significant challenges. In these environments, it is easy to see why the initial perspective on traceability is nothing more than “overhead on the business”.

When the Public Health Security and Bioterrorism Preparedness Act of 2002 is fully enacted, manufacturers, processors, packers, distributors, and importers of food in the United States will be required to maintain records that identify the immediate sources from which they received food and the immediate recipients to whom food products were sent. Processors will be required to create these records at the time of processing. They must maintain the records for a minimum of two years and they must make the records available to the U.S. Food and Drug Administration (FDA) within 4 hours if requested.

### FDA Recalls, 1998 - 2002

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<th>1998</th>
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*Source: [www.fda.gov](http://www.fda.gov)*
Regulation (EC) No. 178/2002 establishes the European Food Safety Authority and outlines the Global Food Law (GFL). These regulations are very similar to those outlined by the FDA in the Bioterrorism Act and are scheduled to be enforced in Europe starting in January 2005. The CanTrace initiative in Canada, the Japanese Agricultural Standards (JAS) in Japan, and regulations in Australia, to name just a few, are also impacting food processors around the globe.

Food processors of all sizes and geographies are under increasing pressure to demonstrate that they are “in control” and proactively gain the confidence of regulatory inspectors. To cope effectively with these evolving requirements and reduce the risks of regulatory sanctions, automated traceability has become a virtual necessity. As outlined later in the case studies, the confidence created by the use of an automated trace system, can have a significant impact on the perspectives of regulatory inspectors and auditors.

As food processors prepare to comply with pending legislation for food safety and traceability, they must also address the growing quality and safety expectations of their customers. For many food processors, compliance with these customer expectations is a paramount concern every day.

At the heart of these concerns lies the notion of “Brand Protection”. As retailers, food service organizations, and marketers of branded products invest to promote their brands in the marketplace, they are also becoming increasingly demanding of their suppliers. Suppliers are now expected to prove that they can consistently deliver high-quality products to ensure they do not put their customers’ brands at risk. In light of recent high-profile food contamination events in the news, such as the ConAgra recall, many food processors now find themselves measured on their ability to help customers protect their brands and reputations.

Source: www.fsis.usda.com
Historically, food processors have competed for business based on metrics such as price, product consistency, and customer service. Today, brand protection is increasingly used as a competitive measure. In highly-competitive markets, the processor that can demonstrate the most reliable means of brand protection can have a significant competitive advantage. In some cases, these processors are in a position to command higher prices and enjoy “preferred supplier” status with their customers.

In general, the demands for brand protection begin at points closest to consumers in the food chain and cascade back all the way to the food source. Every supplier in the food chain ultimately feels the ripple-down effect of the need for brand protection originating at the point of sale to the consumer. This is because every participant in the supply chain assumes the risks of poor quality control, regardless of which partner in the supply chain may cause a problem.

### Brand Protection Demands in the Food Supply Chain

One of the increasingly-common ways that food processors are being tested for brand protection is through food safety audits and mock recalls. Many processors that supply the national retail chains are now conducting mock recalls on a quarterly basis at the behest of the retailers. Other processors conduct mock-recalls, at least annually, as part of their internal QA procedures. Additionally, some of these mock-recalls are being validated by external audit firms as part of comprehensive food safety audits.
For a food processor, the cost of a failed mock recall can be catastrophic. Compared to the initial warnings that might be imposed by the FDA, a customer is not required to provide any warnings. A customer may switch to another supplier based on the failure of even one mock recall. For food processors, the risk of losing a customer due to a failed mock recall is most pronounced when the customer’s investment in brand value is highest. For instance, for a private label manufacturer that supplies products to national brand marketers, a failed mock recall can be devastating. As the private label industry continues to grow, individual manufacturers will come under increasing scrutiny as the brand marketers seek to reduce their risks. Private label manufacturers that cannot conduct mock recalls will struggle to attract new customers and benefit from the industry’s growth.

To address the brand protection and mock recall demands of customers, automated traceability systems have become a requirement for food processors up and down the food chain. For many food processors, their current challenge is to identify an automated approach to traceability that is both cost-effective and a good fit for their current business operations.

The most widely used “systems” for traceability in the food industry today are low in cost and relatively simple. Conversely, they are also high in risk, affording the least amount of protection. These systems are essentially manual, relying on paper records and spreadsheets. These systems are also largely based on financial data such as purchase receipts for raw materials and invoices for finished goods shipped to customers. Very little, if any, operational data is readily available. Some of the inherent risks of this approach include:

- **Speed**
  Customers expect mock recalls to be conducted quickly. The FDA imposes a 4-hour time limit for one-up / one-back traceability. If records are maintained manually, it is very difficult, if not impossible, to quickly produce the necessary traceability records during a mock recall or real emergency.

- **Accuracy**
  The goal is containment. The FDA and customers want to minimize the scope of a potential retrieval. If records are not thorough and accurate, the safety margins in a retrieval will be increased. The direct and indirect costs will be higher for all parties involved.

- **Confidence**
  Without the necessary speed and accuracy, food processors cannot gain the confidence of their customers, auditors, or regulatory inspectors. This confidence is necessary to maintain prices and a competitive advantage.
Many processors rely on their process line control (PLC) systems and manufacturing execution systems (MES) to support detailed traceability requirements. These systems generally provide a wealth of detailed operational data for the manufacturing process. While this data can be an important component in a mock recall scenario, it is limited in scope and therefore limited in its ability to support one-up/one-back traceability requirements. Critical information not addressed by these systems includes purchasing and receiving records, inventory management, transportation records, and customer records. The inherent risk is obvious:

- **Thoroughness**
  The records provided during a mock recall or a regulatory audit must be complete. Any gaps not filled by detailed records in the one-up/one-back chain, will result in exposure to risk for both the processor and their customers. As with the manual systems described above, customer confidence will be compromised.

A new concept is becoming popular with food processors of all sizes and at all positions in the food chain. Much like they already use their accounting systems as their financial system of record, food processors are utilizing enterprise resource planning (ERP) systems as their operational system of record.

Financial systems have long been used to standardize the process of “tracing” the source of all money coming into the company, the disposition and value of all assets within the company, and the source of all expenditures. As a result of this standardization, the financial audit process has also become streamlined and standardized.

With an operational system of record, incoming materials, manufacturing operations, inventory management, and customer shipments are all traced in a manner similar to that of financial systems. The operational system of record can also be used to standardize and streamline food safety audits and mock recalls.

In an accounting system, the general ledger (GL) serves as the central repository of all financial transactions. In an operational system of record, the electronic batch record (EBR) is the equivalent to the GL, serving as the central repository of all operational transactions.

As the central repository of information on all materials and operations that affect the final food product, the EBR provides the mainstay of support for traceability and mock recall requirements. Operational systems of record are often linked directly to production lines (through PLC’s and MES systems) and to inventory (through bar code and RFID systems) to streamline the flow of critical data directly into the electronic batch record. This reduces the risk of errors during data entry and also speeds the flow of information to support real-time visibility and analysis for company executives.
With an operational system of record, the advantages over other approaches can be significant:

- **Instant, Thorough Traceability**
  An operational system of record provides end-to-end traceability for every action that can impact food, starting with the orders placed with suppliers and ending with receipt of finished goods by customers. At any point in the supply chain, a food processor is able to trace back to the source of all ingredients and trace forward to the disposition of all finished products. For instance, if a processor receives a notice about possible contamination of an ingredient, it should be able to immediately identify all customer orders that included that ingredient.

- **Confidence**
  With the instant, thorough traceability made possible with an operational system of record, food processors can gain the confidence of their customers, auditors, or regulatory inspectors. By establishing the confidence of these constituents, processors can establish a competitive advantage that can add real, measurable value to the business.

- **Improved Bottom-line Performance**
  With an integrated operational system of record, food processors also have the ability to improve the financial performance of the company. Detailed visibility into product-line costs and profitability, manufacturing efficiency, inventory spoilage, and many other operational metrics, can expose hidden opportunities for improvement. Additionally, improvements in forecasting, scheduling and order fulfillment can have a positive impact on customer service. The same operational system of record that addresses the “overhead” requirement of traceability can also be used to improve bottom-line profitability and competitiveness.
Four case studies are included below, each representing a different market segment in food processing:

- **Litehouse Foods** - Dressings, Sauces and Dips
- **Berner Foods** - Private Label Processed Cheese and Dairy Products
- **ACME Foods** - Frozen Vegetables
- **Premium Brands** - Specialty Meats

In each case, the processor is using their ERP system as their operational system of record to address traceability requirements and, in turn, gain a competitive advantage through increased confidence in the marketplace. At the same time, they are using their system to improve efficiencies and customer service levels.

**Litehouse Foods**

Litehouse Foods is a leading manufacturer of refrigerated dressings, dips and sauces. Litehouse has grown rapidly in order volume and product lines – the manufacturer has more than tripled its offerings in a five-year period. They have also grown from a regional business to one that distributes products nationally to mass retailers, national grocery chains, and food service organizations. The company differentiates itself based on quality and customer service, with a commitment to using the freshest, highest-quality ingredients with no preservatives or artificial additives.

Prior to implementing their system, records were maintained manually necessitating up to three days to execute a retrieval. With a fully-automated operational system of record, Litehouse now completes mock retrievals in 15 minutes. This has become particularly important as the company has expanded to national distribution. Many of its larger customers require that mock recalls be conducted as part of their routine operational and food safety audits. Litehouse is now able to easily satisfy these expectations and ensure that customers' brands are protected.

**Traceability and Brand Protection**

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**Bottom-Line Improvements**

The detailed visibility needed to support lot trace requirements at Litehouse also enables a wide variety of operational performance analysis and efficiency improvements. With integrated systems for forecasting, scheduling, inventory control, and order management, Litehouse has been able to reduce the overall cost of operations and at the same time, improve customer service levels. Additionally, with detailed costing capabilities, Litehouse can establish efficiency goals and closely monitor and adjust operations to ensure the goals are met. Specific operational improvements include:

- **3x** Increase in product lines with no additional capital investments
- **6%** Reduction in finished goods inventory
- **100%** Reduction in excess safety stock
- **10%** Improvement in order fill rates
- **97%** On-time delivery of customer orders
Litehouse Foods now has the traceability needed to address government regulations and the brand protection requirements of its most demanding customers. In addition, the operational system of record that enables traceability has also enabled the company to make significant improvements in efficiency, cost reduction, and customer service.

**Berner Foods**

Founded as a family-owned business more than 60 years ago, Berner Foods, Inc. built its reputation as a contract manufacturer producing Swiss cheese for companies such as Alpine Lace. In 1988, after noticing a void in the processed cheese markets, Berner built its first processed cheese plant and began mass producing a private-label cheddar cheese sauce. Today, Berner is the dairy industry’s leading private-label manufacturer of premium, processed cheese sauces, spreads, and toppings.

As a food manufacturer, Berner needed to meet evolving regulatory and customer requirements for food safety and quality. As part of current Good Manufacturing Practices (cGMP) and especially in light of increasing regulatory scrutiny from the FDA, USDA, and other government agencies, Berner needed a system that would keep them in lock-step with regulations, such as the Bioterrorism Act of 2002.

In addition, as a private-label manufacturer, Berner contends with tight margins and brand protection demands from its customers. They needed to maximize efficiency, ensure profitability and address the growing expectations of their customers.

**Traceability and Brand Protection**

Having implemented a fully-automated system of record, conducting mock recalls at Berner went from taking an entire day to 30 minutes. The accountability provided by their system of record includes the source and movement of all raw materials, the processes, operations, and operators by which all product has been produced, and destinations where all product has been stored and shipped. Berner has complete visibility and control, from the time orders are placed for raw materials to the time orders are filled, shipped and received by customers.

**Bottom-line Improvements**

The operational system of record used by Berner Foods also includes bar code scanning for automated entry of all inventory activities. This provides immediate and highly-accurate accountability for lot trace requirements and is also used to improve overall inventory management and customer service. Previously, inventory shortages had resulted in delays in production and customer order fulfillment. With integrated planning and scheduling and immediate inventory visibility, Berner has leveraged their operational system of record to reduce inventory costs, improve production efficiency, and significantly improve customer service.
Specific improvements include:

- **38%** Reduction in scrap and waste ($200,000 saved per year)
- **10%** Reduction in labor costs tied to inventory management ($40,000 saved per year)
- **100%** Reduction in inventory lag time
- **5%** Improvement in production throughput
- **99%** Reduction in stock-outs
- **ZERO** Customers lost in 12 months

Berner Foods now provides the all-important brand protection assurance required in the private-label manufacturing business. In addition, their operational system of record has enabled significant improvements in efficiency and customer service. All together, these improvements enable Berner to maintain profit margins by maintaining their position as the high-quality, high-service provider in the market.

**ACME Foods**

ACME Foods is a leading processor of carrots and other vegetables. Their products are provided as ingredients to other manufacturers primarily in the consumer packaged goods (CPG) markets, such as canned soups and frozen dinners. The company operates processing plants in the United States and Canada with its primary storage facilities in Canada.

**Traceability and Brand Protection**

One of ACME's largest customers is the USDA National School Lunch Program (NSLP). By law, all food products used by the NSLP must originate in the United States. Because ACME stores all products in their Canadian storage facilities, they endure the scrutiny of the USDA and must ensure that no food product of Canadian origin is inadvertently shipped for NSLP use. To provide the assurance demanded by the USDA, ACME successfully uses their operational system of record to provide the detailed accountability and traceability that ensures the origin of all food shipped for the NSLP.

ACME also ships products to extremely demanding customers in Japan. The customers insist on having access to detailed records that account for the origin and all processing and storage operations performed on the food. ACME uses their operational system of record to address these requirements and successfully grow their customer base in Japan.

**Bottom-Line Improvements**

The operational system of record provides integrated management of all accounting, product costing, and supplier management functions. ACME leverages this system to manage their farm cooperative partners, account for the cost of all products, and track the quality of all products received from their broad base of suppliers.

* Name changed to protect customer privacy
The system used by ACME also includes bar code scanning for automated entry of all inventory activities. This has been used to reduce manual overhead and streamline overall production schedules.

Because ACME products are shipped from Canada, they must now abide by the requirement of prior notice of imports mandated by the Bioterrorism Act of 2002. ACME uses their operational system of record, along with a standard fax automation system, to send detailed notifications of all imports to the FDA and US Customs. These notifications are automatically generated by the push of a button in their system of record and exceed the level of detail mandated by the Bioterrorism Act.

Premium Brands

Premium Brands is a holding company for an expanding list of affiliate food processors in Western Canada and the United States’ Pacific Northwest. The company provides high-end deli and specialty meat products to food service, retail, and wholesale customers in Canada and the US. In the last five years, Premium Brands has acquired over 20 branded specialty meat products. To provide superior customer service in their markets, the company created its own proprietary distribution network, expanding the current corporate and food service channels, with a centralized warehouse for all products and its own fleet of trucks for direct store and home delivery.

Traceability and Brand Protection

By including the management of their direct store delivery (DSD) in their operational system of record, Premium Brands can trace product to the store shelf in 20 minutes. With this performance, the company can efficiently and accurately conduct mock recalls and contain the scope of a potential recall if necessary. Because of this assurance demonstrated by Premium Brands, they have been able to reduce the premiums paid for their liability insurance.

Bottom-Line Improvements

Premium Brands has grown rapidly through the acquisition of branded products. As they have acquired new processing facilities, their operational system of record has been used to help standardize all business functions across the growing company. The system enables the company to track and manage a host of business processes and has positively touched nearly every critical aspect of the business – from costs, to revenues, to profits.

Product shelf life is of major importance in specialty foods. At Premium Brands, every individual item is date coded to the unique requirements of each customer. If product does not sell in the specified time, the company must pull it off the shelf and dispose of it at their expense. Using the expiration date management capabilities in their system, Premium Brands has cut lost revenues from returns by 50 percent, adding another 2 - 3% directly to the company’s bottom-line performance.
Real-time sales order processing, tightly coupled with inventory control, has also given the company the visibility to stock fleet trucks with as much as half a million dollars in perpetual inventory that serves as a rolling extension of the warehouses. Delivery drivers can fill new customer orders on the spot and field orders are processed by mobile technology that is uploaded to the system nightly. The company harvests the information daily so they have complete visibility to inventory and sales, regardless of the location.

**Summary**

To ensure the safety of the domestic and global food supply, government regulations and brand protection demands from customers are on the rise. To address these growing requirements, operational systems of record have become a requirement for food processors up and down the supply chain. For many food processors, their current challenge is to identify an automated approach to traceability that is both cost-effective and a good fit for their current business operations. In addition to addressing traceability requirements, operational systems of record deployed by progressive food companies are also used to streamline schedules, reduce operating costs, and improve customer service. Rather than piling on overhead costs, these solutions are leveraged to improve bottom-line profits.

For more information on the use of an operational system of record, please visit www.rossinc.com or www.FocusedOnFoods.com.
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