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On the Trail to Effective Traceability

Today, many food companies, both organic and conventional, are finding that a good traceability system is better than the best insurance policy. Why? Because the need for a way to document due diligence on multi-faceted levels has risen dramatically in response to a growing number of food safety, biosecurity and labeling regulatory requirements, ever-present market pressures driving the need for product differentiation, and continued consumer demand for more substantive information about the foods they consume. A traceability program offers the food manufacturer a way to systematically document compliance with regulations and industry standards and to verify the adequacy and effectiveness of internal process controls, food safety, biosecurity and quality assurance (QA) practices.

The ability to trace food ingredients and products from farm-to-fork (and back-to-farm) provides companies with a higher level of confidence that the food manufacturing and distribution chain is not compromised in terms of food safety, security or quality attributes at any stage. The following recent regulatory developments and market trends have spurred the food industry to create and implement more efficient traceability along the supply chain continuum:

- The enactment of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 requires the U.S. Food and Drug Administration (FDA) to enact and enforce regulations to protect the food supply in the event of a terrorist attack. All food processing companies in the U.S., excluding farms and restaurants, are required to follow these regulations, which ensure that food companies can account for every link in their supply chain. For example, the act requires food companies to provide the FDA with ingredient source data, including immediate previous source (IPS) and immediate subsequent recipient (ISR) for every component used in the manufacturing process.
- The emergence of bovine spongiform encephalopathy (BSE), or mad cow disease in North America, and the Country-of-Origin Labeling (COOL) Act, have focused attention on traceability in the cattle/beef sector and jump-started the development of a national animal identification system.
- Food manufacturers' customers downstream—restaurant and food service operators, supermarkets and big box and other food retailers—are increasingly requiring processor-suppliers to meet traceback specifications as part of winning their business. Wal-Mart, for example, has led the way in placing the onus for traceability upstream by specifying that its suppliers use radio frequency identification (RFID) tagging of cases and pallets to increase stocking and inventory efficiencies.
- Highly publicized foodborne illness outbreaks associated with pathogens, such as *Listeria monocytogenes*, *E. coli* O157:H7 and *Salmonella* in a variety of categories—although on the decrease in the U.S. according to the U.S. Centers for Disease Control and Prevention (CDC)—still account for a significant number of voluntary product recalls by the food industry each year. Only the mislabeling of allergen- and allergen residue-containing products charts a higher percentage of recalls. This fact is one of the most compelling reasons that food manufacturers are adopting

or improving their traceability systems: Food companies want to make safe and wholesome products for consumers, not products that are of public health concern.

Companies also are finding that traceability programs are just good business. In a product recall crisis, the company that can isolate, identify and correct the problem quickly is the one that

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escapes with the least harm done. Similarly, the company that can provide documentation that its food protection and QA systems are working effectively may be able to show that it is not part of the problem, aiding investigators in focusing their efforts on more likely sources of the recall.

Conversely, companies that do not have an efficient traceability program face a nightmare scenario—one that drags on for days and weeks as the disorganized company works with regulators to sift through all the records and work through a process of trial and error to root out the source of the problem. Few can afford to shut down production lines until the problem is resolved, few can survive the associated costs of a large recall or potential future litigation, and no company wants its reputation or brand name damaged in the eyes of consumers.

Of course, the organic food industry has long been ahead of the curve with regard to traceability because producers and manufacturers must demonstrate a link between the raw materi-

als and the finished product. When there is a question about the organic integrity of a product labeled as “100% Organic,” “Organic,” or “Made With Organic” specified ingredients, companies must be able to verify to regulators and consumers alike that their certified organic products and the ingredients used to make them are produced and handled according to the U.S. Department of Agriculture’s (USDA) National Organic Program (NOP) standards. In addition, organic companies that export to other countries, such as the European Union and Japan, must meet stringent and well-established rules when making an organic label marketing claim, providing verification that products meet the necessary standards before product will be accepted into those international markets. As such, verification of the quality attributes required of and unique to organic—pesticides have not been applied to crops, or products are not produced with genetically modified organisms (GMOs), for example—goes to the heart of product differentiation, an essential driver in the proactive use of traceability systems.

europa.eu.int/comm/food/food/foodlaw/traceability/index_en.htm

On Jan. 1, 2005, the European Union’s (EU) Regulation EC/178/2002 came into effect, which contains general provisions for the traceability of all food and feed and all food and feed business operators in the EU, without prejudice to existing legislation on specific sectors, such as beef, fish, GMOs, etc. Importers are similarly affected as they will be required to identify from whom the product was exported in the country of origin. Unless specific provisions for further traceability exist, the requirement for traceability is limited to ensuring that businesses are, at minimum, able to identify the immediate supplier of the product in question and the immediate subsequent recipient, with the exemption of retailers to final consumers (one-step-back, one-step-forward).

ers.usda.gov/briefing/traceability

The USDA Economic Research Service (ERS) Briefing Room on Traceability in the U.S. Food Supply features several reports on market incentives to establish traceability, private sector traceability systems costs and benefits, and industry and government response to market failure. The most recent report, “Traceability in the U.S. Food Supply: Economic Theory and Industry Studies,” describes the results of an investigation into the amount, type and adequacy of traceability systems in the U.S., focusing particularly on the fresh produce sector, the grains and oilseeds sector, and the cattle/beef sector.

The investigation finds that traceability systems vary across industries, including a discus-

sion of the organic industry, as firms balance the private costs and benefits of traceability to determine the efficient level of traceability.

ifst.org/hotspot24.htm

The Institute of Food Science & Technology (IFST) updated in February 2005 its white paper, “Current Hot Topics: Organic Food.” The report provides organic market growth statistics, an overview of international regulations and standards, and discusses how organic husbandry principles are now applied with the benefit of modern scientific understanding and technologies that give rise to a more sustainable system of food production. The nonprofit scientific organization’s white paper provides a review of the additional legal requirements for organic producers and processors regarding cultivation, composition, labeling and traceability.

Although the majority of organic processors have well established traceability systems, in and of itself, traceability is not a silver bullet. It is important that companies routinely review and reassess their systems to ensure that they are getting the nec-

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essary organic certification, food safety and quality standards, and regulatory compliance coverage needed to manufacture and market premium products. A good way to start is to revisit the definition of traceability to understand its significance and to consider a few strategies that can be used to evaluate the system's efficacy in order to identify areas of improvement.

Defining Traceability

The most internationally recognized definition of traceability defines it as the “ability to trace the history, application or location of that which is under consideration” (International Standards Organization [ISO] 9000:2000). A traceability program is a system comprised of “one-step-forward, one-step-back” verification steps and documentation of the management of agricultural and food production, inventory, logistics, supply, quality, safety, product recalls and withdrawals, biosecurity and regulatory compliance.

In defining traceability, it is important to distinguish between tracking and tracing. Simply put, tracking is the capability to follow the path of a specified unit of a product and/or batch through the supply chain as it moves between organizations towards the final point-of-sale or point-of-service. Tracing is the capability to identify the origin of a particular unit and/or batch of product located within the supply chain by reference to records held upstream.

In organic certification, the tracking system begins at the farm, where the producer maintains records, including the use of inputs applied to crops and specific details on planting, harvesting, storage and sales. Organic certification also requires the processor or handler to maintain detailed records of all incoming organic ingredients, where they are stored, how they are processed, how the equipment is cleaned prior to processing organic goods, what pest control procedures are in place, and ultimately, how the integrity of organic materials is maintained while being handled at the processing facility.

Tracking systems in food manufacturing, while necessary for organic certification, are also required for quality assurance programs, such as ISO 9000; food safety programs, such as Hazard Analysis and Critical Control Points (HACCP); and identity preservation (IP) programs for genetically modified organism

(GMO)-free products. Tracking systems facilitate product recall in food safety emergencies, enable the verification of label claims (e.g., for “Organic” or “GMO-Free” products), aid in the prevention of fraud where analytical testing cannot be used to prove authenticity, identify the origin of the ingredients, and identify problems in production of products or with ingredient suppliers.

If the food processor has included adequate and appropriate data points in the tracking record-keeping systems, the organic certifying agency auditor or regulatory inspector will be able to more effectively conduct a traceback in the event that tracing a lot or batch of product is necessary during the course of their activities.

Covering the Bases

It is not difficult to design a tracking system that can provide, with a few mouse clicks, critical details about the life of the product. Data points can include everything from the handling history of the product, such as the driver of and vehicle in which the product was delivered, the specific warehouse in which it was staged, and the factory in which it was processed; to processing details, such as which machine on which shift with which team the product was made. Also important to include are the vendor lot numbers for each ingredient and the original agricultural components going back to the exact field where the product was raised.

Types of documents that piece together a tracking system may include organic/transaction certificates, purchase contracts and invoices, bills of lading, transport affidavits, weight/scale tickets, receiving records, product inventory reports, production reports, packaging reports, shipping documents, sales invoices and outgoing transaction certificates. All of these documents should be maintained for a distinct

batch or lot and should relate to one another to facilitate traceability. Each time an organic product is handled, transported, stored or sold a record must be generated. Furthermore, if an organic product is handled by more than one facility to accomplish several different processing activities, documents need to track the movement of organic products from one processing facility to another. This is commonly referred to as “chain traceability.”

The most successful companies, such as Green Mountain Coffee Roasters, have developed highly efficient and effective product tracking by using automated information technology database systems to collect and maintain these documents. By automating the traceability information, the processor now has a way in which to better evaluate the system’s efficacy during a reassessment of the company’s traceability program.

In order to trace each bag of roasted coffee back to its origin, for example, Green Mountain tags each receipt of raw, green coffee with a lot identification (ID) number, identifying its country of origin, crop year, farm (if known), and other data based on the purchase order, notes Patty Vincent, coffee product manager. As it goes through the roaster, each batch of beans is tagged with another lot ID that identifies what green coffee lots were roasted when and on what roaster. After blending, another lot ID identifies what roasted coffee lots were blended. Packaging is similarly tracked.

All of this data is stored in two databases: a Praxis roaster control system tracks roasting and blending, and a PeopleSoft Enterprise Resource Planning (ERP) system tracks procurement and production. Queries that link the two databases delivers the data instantly. “That way, if we need to determine the source of our cup of java, we simply trace back

through the chain of lot IDs to get to the green coffee purchase,” Vincent says.

Another good way to check whether the production facility’s traceability systems are working effectively during a reassessment is conduct an internal inspection and follow up with a mock recall for verification. This is a good strategy because during

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organic inspections, the inspector focuses heavily on a facility’s tracking system to confirm that the organic product complies with organic regulations. Since the organic inspector is usually only onsite for several hours out of an entire year, they rely on accurate, clear and detailed records that describe how the organic product was transported, received, stored, manufactured, packaged and distributed the other 364 days of the year. One of the inspector’s roles is to test the facility’s tracking system to reveal deficiencies and communicate those deficiencies to the facility and to the certifier.

The inspector tests the system by randomly choosing a finished product and tracing it back through all of the tracking documents to the ingredients used. This exercise also checks the pest control and sanitation records generated at the time to ensure that the relevant cleaning and sanitizing procedures were in place to protect the organic ingredients and products from contamination. While the inspector’s findings can assist the facility in fine-tuning and improving their tracking system, certifiers encourage their clients to internally audit their organic tracking system in order to pick up any problems and correct them before the inspector arrives. This provides an excellent opportunity for the processor to reassess the effectiveness of the tracking system and to test its veracity through a mock recall.

“Our goal is to be inspection-ready every day,” notes Will Daniels, director of quality assurance for Earthbound Farm. He uses annual inspector audits as a jumping off point for improvements. “We expect auditors to bring a fresh set of eyes to the program and flush out areas or issues that we are not seeing because we are around it every day. If we do not come away from an inspection audit with something to work on, there is not as much value for us.”

Testing the tracking system during the inspection can be very time-consuming, especially if it is not designed with traceability in mind. The best way to ensure the traceback system is working is through practice simulations, or mock recalls, Daniels says. “You don’t want to wrestle with issues in the middle of a crisis, so testing the system is imperative. Mock recalls are the best way to identify weaknesses, giving you the opportunity to take correc-

tive actions before a real issue arises.”

When the processor stages a mock recall, all of the facility’s recall team members and suppliers, if possible, should participate so that they have practice doing their specific tasks. “Everyone looks good on paper,” says Daniels. “It’s the ability to take what is written and translate that into action that is important.”

Smart Systems Have Common Threads

As the organic food processor initiates a review of the traceability system, it is also a good idea to consider what constitutes a good tracking system. Here are some things to consider: Does it include accountability (responsible staff sign-off for each element)? Does it include only essential elements, or do you have several separate documents that could be combined into one document? Are the respective elements of the audit trail physically located such that they can be quickly accessed?

Less efficient tracking systems are often comprised of a collection of documents, each designed to accomplish a single function rather than to be integrated with other tracking documents and thus serve as a functioning part of the overall audit trail. A smart tracking system is more centralized and interconnected. No matter how complex the operation, a smart tracking program should have a single document that is the “heart” of the system tying all relevant identification numbers together. It uses the same number as many times as possible to create an easy-to-follow trail from the processor’s customer back to the processor’s vendor. Examples of numbers used include the lot or batch number, the “use by” date and the customer’s PO number. The same number often can be used for the order number, a “pull sheet” number, a bill of lading number, and an invoice number. However, it is impor-

tant that any time batches are combined or ingredients are mixed together, a new number is assigned and recorded to keep the tracking system intact.

By performing regular reassessments of the traceability program, the organic food processor will gain valuable insight into the facility’s overall production efficiencies, its rate of compliance with industry quality standards and regulations, and the adequacy of its food safety and security systems. However, the traceability system is only as good as the information entered. Tracking systems should be unique to each individual operation, designed to be as simple as possible while still performing the overall objective: linking the product or ingredient from the supplier into the handling facility, through all the intermediate steps of that process, and through the distribution chain to the consumer’s table.

Organic food companies that proactively and routinely evaluate the effectiveness of their traceability systems not only know that verifiably good traceability is better than the best insurance policy—they know they’re providing themselves extended coverage that increases benefits and mitigates risks, from seed-to-shelf. □

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