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# Tracing the Genealogy of an Outbreak



A whitepaper by

**Nick Bova**

*General Manager, Food & Beverage*

Anyone who has ever tried to trace their roots back more than a couple of generations (i.e. the people you've known personally) knows how challenging that task can be. Unless you are of royal lineage, the path back through history tends to be full of false leads and dead ends. What information there is tends to be kept on handwritten notes that have to be painstakingly sorted through and reviewed in order to glean the information you need.

Of course, even if you can find the right file drawer in the right building in the right town in some other country, there's no guarantee you'll get what you need. If a last name was misspelled back in 1805, or an important detail (such as the mother's maiden name) was left out, getting past that point can be a daunting and hugely time-consuming task.

This is the same challenge food processors often face when there is a problem with end products that use produce. Tracing the lot back through handwritten ledgers to the grower, block, field, etc. in order to discover what other products may have been affected is a painstaking and costly effort. And all it takes is one zero that looks like a six in one entry to send the entire investigation in the wrong direction, creating delays in performing a recall which in turn increases your exposure. Tracing that lot forward to all the products in which it was used can be an equally daunting, transaction-heavy task involving multiple receipts, bills of lading, purchase orders, and other paperwork.

A new generation of enterprise software designed specifically for the needs of food and beverage processors can help solve these issues. Data on each lot received, such as grower, field and date, is entered once. This data is then maintained throughout the manufacturing cycle in a manner that is in keeping with the way food is processed, providing a precise lineage for every finished product. Should a problem arise, simply specifying grower, field(s), and the associated date range will retrieve the appropriate lots and construct the entire history in minutes rather than hours, allowing you to act quickly and decisively when it is needed most.

Let's take a closer look at how the accuracy and precision of this new food processing-specific software can have an impact on your business.

## Eliminating Human Error

In any type of endeavor where record-keeping is required, the biggest risk is human error. Entering dates, numbers, or other simple data is not exactly brain-stimulating work, so sooner or later less than optimum focus will be placed on it. Even if the correct information is entered, it does not mean that what was written will be legible to the person trying to read it. Whether it's sloppy handwriting, a smear caused by a bad pen, or any other cause, a hard-to-read entry can create all sorts of problems, from delays to outright errors, if a lot must be traced. It can also be costly. While you try to sort out the good information from the bad, resources are pulled away from normal duties. And the clock is ticking.

Scanning batches with a bar code reader may address some of these issues. However, it's still up to the individual working the scanner to do the job right. One mistake, one inopportune moment of confusion, and those records are no longer valid.

No matter the cause, the impact of a misread is two-fold. On the one side, you will not be able to recall all of the products with problems – at least not right away. It will take time to find and decipher the entry; it may even require finding the operator who made the entry to determine what it says. All of this could put you well beyond the four hours mandated by the FDA for a recall. If the error is bad enough you may even miss a few lots.

Another problem with manual tracking is that you may recall products that are perfectly safe, which costs you unnecessarily. Your overall margins are reduced and resources are tied up tracking, shipping, and receiving products that do not need to be handled again. This manner of tracking could also hurt your customers' brand image by associating them needlessly with a product recall.

A fairly recent example of the problems associated with lot tracking came with the spinach recall in September of 2006. Because spinach from a single field was used to produce products under a variety of brand names, the ties between the brands were not readily apparent. It was only after exhaustive transaction tracing that the common bond was uncovered and the problem contained – a process that took nearly a week. In the meantime, many unaffected batches of spinach as well as some forms of lettuce disappeared from grocers' shelves in the interest of safety.

*“Perhaps the single largest improvement that can be made in traceability is replacing manual data entry and tracking with automated systems. The reason is simple: elimination of human error.”*

With the right software performing end-to-end management, you can not only eliminate manual data entry, you can also track product lineage based on the way your food processing plant works, for instance by viewing batches within a shift or between clean-ups as a single batch. That way if there is a problem with a timeframe or project, you can trace it back quickly and easily to everything produced during that assignment, minimizing the use of resources and additional transactional costs. You can also trace issues forward to all products produced out of a compromised batch just as easily.

The net result is that lots can be traced back all the way to the field in three to four minutes – well under the FDA's requirements. In addition, the information you receive back will have a much higher degree of accuracy, allowing you to get problem products off the shelf (or out of a quick service restaurant) more quickly, limiting your exposure from consumers ingesting them. Upgrading to this type of response time should also help with the industry's efforts to self-regulate rather than getting the government involved, which is a definite plus for everyone.

### **Food Processing v. Discrete Manufacturing**

Using software to track raw materials in manufacturing is nothing new. The problem is most of the software that has been used is designed for discrete manufacturing, i.e. products with relatively low volume and high complexity such as automobiles and jet airplanes. The parts used in them can be intermixed since they go through a rigorous inspection process. In addition, even if bad parts do manage to sneak through, they do not generally affect the quality of other, good parts.

The food and beverage industry, however, uses batches of ingredients to produce finished products. A typical day's run in a high-speed environment may involve numerous batches of the same types of ingredients, with the next batch being added to the previous one without stopping production. Even if production is stopped to add the next batch, it is unlikely the machinery will be cleaned between runs, as that would be inefficient and unnecessary under normal circumstances. In short, after awhile you can't tell where one batch ends and the next begins.

As a result, one batch with bad ingredients can potentially affect several production runs that follow. Being able to trace a product's lineage quickly by date provides a much better indication of what else may or may not be affected. That's not where it stops, however.

Say a bakery receives a lot of eggs that contains harmful bacteria. Those eggs are divided and mixed into batches that are used for cookies, snack cakes, and bread in different areas within the plant. Charting the specific disposition of all those eggs by product would be an extremely complex and transaction-intensive task. You would need to generate hundreds or thousands of transactions to trace the lineage back from the final products to the lot.

If you have to pay a \$10 per hour worker to enter 1,000 transactions and each transaction takes 3 minutes to enter, each transaction costs you fifty cents, that's \$500 of transaction processing costs. Repeat that cost on a daily basis and the transaction cost to support traditional batch tracing is enormous. The cost is also unnecessary.

Using enterprise software with date-based extended lot trace functionality to tie finished goods to the batches from which they are produced provides all the information you need to trace ingredients back to the farm or forward to the grocer's shelves. The minute a bad finished product is identified you can run a report that shows where the ingredients in the batches came from, when the batches were used, and where the finished products went.

Tracking by a date-based batch rather than by the individual "parts" as happens in discrete manufacturing also makes more sense when you consider the typical production environment for food processing. Bakeries tend to be hot and dusty. Produce processing plants tend to be wet and humid. Meat processing plants tend to be cold, which means their workers wear gloves. None of these environments is exactly where you want to be performing critical, high-volume transaction entry.

Tracing batches by date or shift rather than individual production lots simplifies transaction entry and keeps it off the shop floor. This method addresses the realities of the food-processing environment while providing the accountability required to meet both government and customer requirements.

## Getting the Big Picture

While traceability is the industry hot button right now, it's not the only issue processors need to address. Many have various technologies in place to address specific needs, and all work well individually. But when it comes to moving information between them, such as forwarding inventory management data into the accounting system in order to streamline accounts payable, these separate solutions can be almost as much of a hindrance as a help.

The new generation of food and beverage processing software again can assist here. Applications are now available that address not just specific aspects of the industry but the entire process. These true enterprise software products make management of the entire enterprise far more seamless than it has ever been, helping you integrate data throughout the entire operation while reducing overhead costs. This integration not only helps with general operation. It also makes it easier to hold each part of the supply chain accountable in the event of a recall.

Even food processors that already have enterprise resource planning (ERP) systems in place can benefit from switching to this new type of software. Most of the major ERP systems are designed for discrete manufacturing rather than batch processing. This means processors often have to do their batch tracing outside of the ERP system using manual processes, and use best-of-breed software to provide additional food and beverage related functionality such as quality control and HACCP tracking and reporting.

Replacing the legacy ERP systems with software designed specifically for the food and beverage industry provides best-of-breed functionality in a single integrated environment. This typically results in increased ability to leverage the food and beverage specific functionality, the elimination of interfaces and manual processes, and a reduced cost of ownership.

## Battling Bioterrorism

While most of this discussion has focused on unintentional food contamination, there is also a heightened sense of awareness of the risks of bioterrorism affecting the food chain. Governments in both the U.S. and Europe have placed stricter requirements on food processors for both forward and backward traceability in the event of an act of bioterrorism. Again, the four-hour tracing requirements come into play.

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*“With food and beverage processing software, lot tracing, product recall compliance, and most importantly containment, can begin in a matter of minutes...”*

With food and beverage processing software, lot tracing and product recall compliance (and more importantly containment) can begin in a matter of minutes. Rather than having to look up receipts from suppliers, write down the batch numbers in which their products were used, and then manually trace them through to individual products, you can simply run one report. That report will show ranch, block, and date of use. It will also tie to the batches in which they were used, showing the common heritage for products that isn't readily apparent from manual records or even discrete manufacturing tracking.

The net result is you are able to act quickly and decisively to help minimize the affects of a bioterrorism attack – which helps both your customers and your country.

### **Improve the Lineage**

Poring over ancient texts in dimly-lit government buildings to trace one's ancestry through time is a relaxing hobby for many. Tracing your product's history, however, is a high-stakes essential where the price of non-performance can be devastating.

Automating the process takes much of the risk out of batch tracing while improving your organization's ability to respond in a crisis. It puts you in better control of the data, assuring you have timely, accurate information within minutes of placing the request. In short, it will make you the envy of genealogists – and your competitors – everywhere.

*Nick Bova is the General Manager for Junction Solution's Food & Beverage practice. JunctionF/B™ provides food & beverage processors and distributors with a powerful and flexible ERP system that addresses the critical and unique needs of the industry. Nick can be reached at [nbova@junctionsolutions.com](mailto:nbova@junctionsolutions.com).*