The importance of having an efficient traceability system

by Alexander Skoulis, Mettler Toledo, 1900 Polaris Parkway, Columbus, Ohio 43240, USA.

Food safety regulations, such as EU178/2002 or the US Bioterrorism Act, as well as retail-driven standards, require food suppliers to ensure traceability on a one-up/one-down principle, but they do not dictate methods required to achieve that.

Some companies comply using paper-based systems; others may require fully networked computer and bar-code systems to effectively meet requirements.

Good traceability not only helps a manufacturer comply with legal and regulatory requirements; it also shows how the right systems and equipment can contribute to production efficiency through better stock management and minimised waste.

What is traceability?

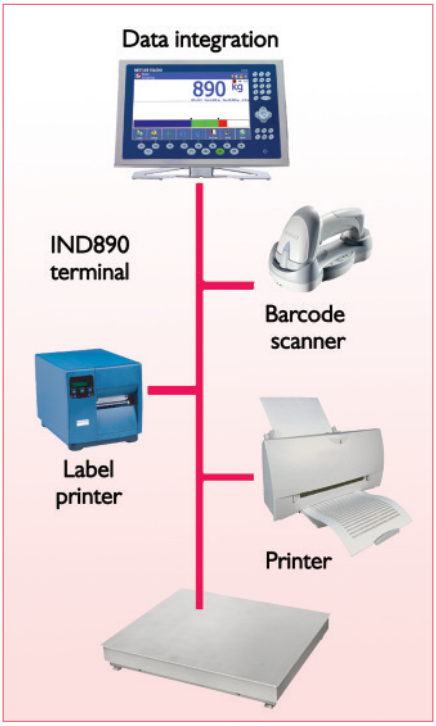
Traceability is defined as the "ability to … follow raw materials and components intended to be, or expected to be, incorporated into a product, through all stages of receipt, production, processing and distribution."

It can also help ensure that product safety and quality attributes have been checked (for example country of origin, species of animal, whether all components are quality-checked and released for production or that products are free of foreign bodies).

Traceability is a legal requirement for food, feed and related products. In addition, it is a basic element in safety and quality management schemes, such as the GFSI-accepted standards (BRC, IFS, SQF, and FSSC 22000) or in national industry and product specific regulations (for example EU beef labelling regulations).

Traceability requirements are linked to legislative demands that any product placed on the market shall be fit for purpose and not injurious to health.

As a risk-management tool, traceability allows businesses and authorities to withdraw products identified as unsafe. It also:



- Minimises costs incurred by making recalls more effective.
- Allows targeted action to prevent recurrence.
- Assists in problem diagnosis, passing on liability where relevant.
- Promotes customer confidence and brand protection.
- Optimises production efficiency and quality control (stock control, material usage, and origin/characteristics of products).

Designing a system

Legislation generally requires a 'one-up-one-down' approach to traceability. One-up-one-down means that food and feed business operators are able to identify from whom they have been supplied with a food, feed, or food related item (one-down) and they are able to identify to whom their products have been supplied (one-up).

Integration of internal and external systems improves efficiency. Therefore, it is worth considering systems operated by raw material or component suppliers and customers to understand a company's interaction within the supply chain.

General principles

Some general principles to consider when designing or challenging an existing traceability system include making sure that it:

- Covers all stages of receiving, production, processing and distribution.
- Identifies raw material suppliers.
- Identifies which components have been used in which product.
- Identifies supplied customers.
- Identifies which products and intermediates have been disposed of (verification of destruction may be required).
- Ensures products supplied to customers are adequately labelled or identified to facilitate traceability.
- Provides details to authorities on-demand in a timely manner. An ideal system fits into a company's normal work practice and enables quick and easy collection of relevant information.

Risk assessment

Relevant variables, such as the nature of products and raw materials, must be considered through adequate risk assessment.

Design will depend on elements including:

- Number/nature of raw materials and components.
- Criticality and risk of components used.
- Batch/lot sizes and uniformity.
- Production processes.
- Number of component combinations and lot splits.

Verifying product safety

A traceability system can be used to confirm that safety and quality checks have been performed and sufficient records have been retained for verification. This is particularly significant when investigating customer complaints and legal compliance.

Continued on page 23

Continued from page 21

Any test results, such as microbiological testing, must also link back to original batches.

A growing number of consumer products must be supported by an electronic file containing documentation that demonstrates the product meets safety standards. This file becomes part of the traceability system. It is good practice to use technical files even when it is not a specific legal requirement.

Regulations and certifications require traceability, but none are prescriptive. A system may be paper or computer based. The best system fits into the company's normal working practice and enables easy information access.

Weighing scales are often important material identification points in a traceability system. Scales as identification points with barcode scanners and printers can be fully integrated solutions that are easy for any production worker to operate.

Paper-based systems

A paper system may be cost effective for processes with a limited number of materials or components and little lot combination or split situations. However, documentation practice and form design will need to be reviewed to reduce the risk of human error.

Mettler Toledo offers various easy to operate solutions to significantly reduce the amount of errors in your traceability process. Systems include PC-based recipe weighing solutions providing seamless documentation, fully integrated solutions including scales, touchscreen terminals, and scanners/printers from goods-in to commissioning/shipment.

Bar-code labelling

Bar-code systems can be more accurate where large amounts of data need to be tracked.

Internationally recognised European Article Number (EAN) systems can ensure integration of information throughout the supply chain.

RFID systems provide efficient, interactive data management as well but are typically more expensive. Intelligent weighing terminals connected to bar-code printers and scanners can clearly mark and identify raw materials received and semi-finished and final products.

For areas with multiple formulation processes, such as vitamin premixes or spice kitchens, PC-based recipe weighing can provide seamless documentation of how much of what component was weighed when, where and by whom.

Benefits include material flow transparency, better stock management and human-error reduction. Improved production follow-through may be guaranteed for some industry segments.

Integrated systems

Integrated solutions that include scales, scanners and printers from goods-in to shipment provide the highest level of traceability.

All data can be linked and processed in real-time, providing clear identification of raw materials/intermediate components and warehousing/storage records.

Genealogy trees allow immediate upstream tracing and downstream tracking of potentially faulty components and batches.

General efficiency improvement through functions such as yield analysis, line performance comparison and stock optimisation help improve productivity.

Mettler Toledo offers data integration into existing ERP, MES, or management systems.

Truly traceable

Truly gapless traceability requires that all involved parties feed recipe-relevant data – ingredients, structures, work instructions, batch and production-order information – into a centralised system.

A computer-based system's advantages over a paper-based system include data consistency, speed of data analysis and improved recall management.

An electronic system can also document processes, generate weighing and manufacturing reports, and print labels to identify goods-in-process.

This brings users one important step closer to compliance with EU 178/2002; BRC; and Controls Used for Manufacturing, Processing, Packing or Holding Dietary Supplements for FDA 21 CFR Part 111 CGMP Regulations. This type of system is also vital for transparent manufacturing processes and providing a proper decision base for streamlining processes.

Summary

Recurring incidents, such as dioxin in pork, emphasise the rising importance of efficient traceability.

Tracking and tracing food, feed and food-producing animals through production and distribution stages is proving vital to consumer safety and company reputations.

Implementing state-of-the-art traceability offers:

- Minimised number and scope/impact of recalls.
- The ability to perform fast, precise product recalls.
- Enhanced consumer protection and confidence.
- Improved brand building and protection.
- Increased production efficiency and quality control.

Integrated technology can help eliminate manual record-keeping, save time and eliminate error potential. It also improves quality control and supports data integration into existing MES or ERP systems.

Ultimately, a well designed traceability system will help increase food safety, provide easier fulfillment of legislative principles and a wealth of data that can help with internal process improvement. ■

MES/ERP system.