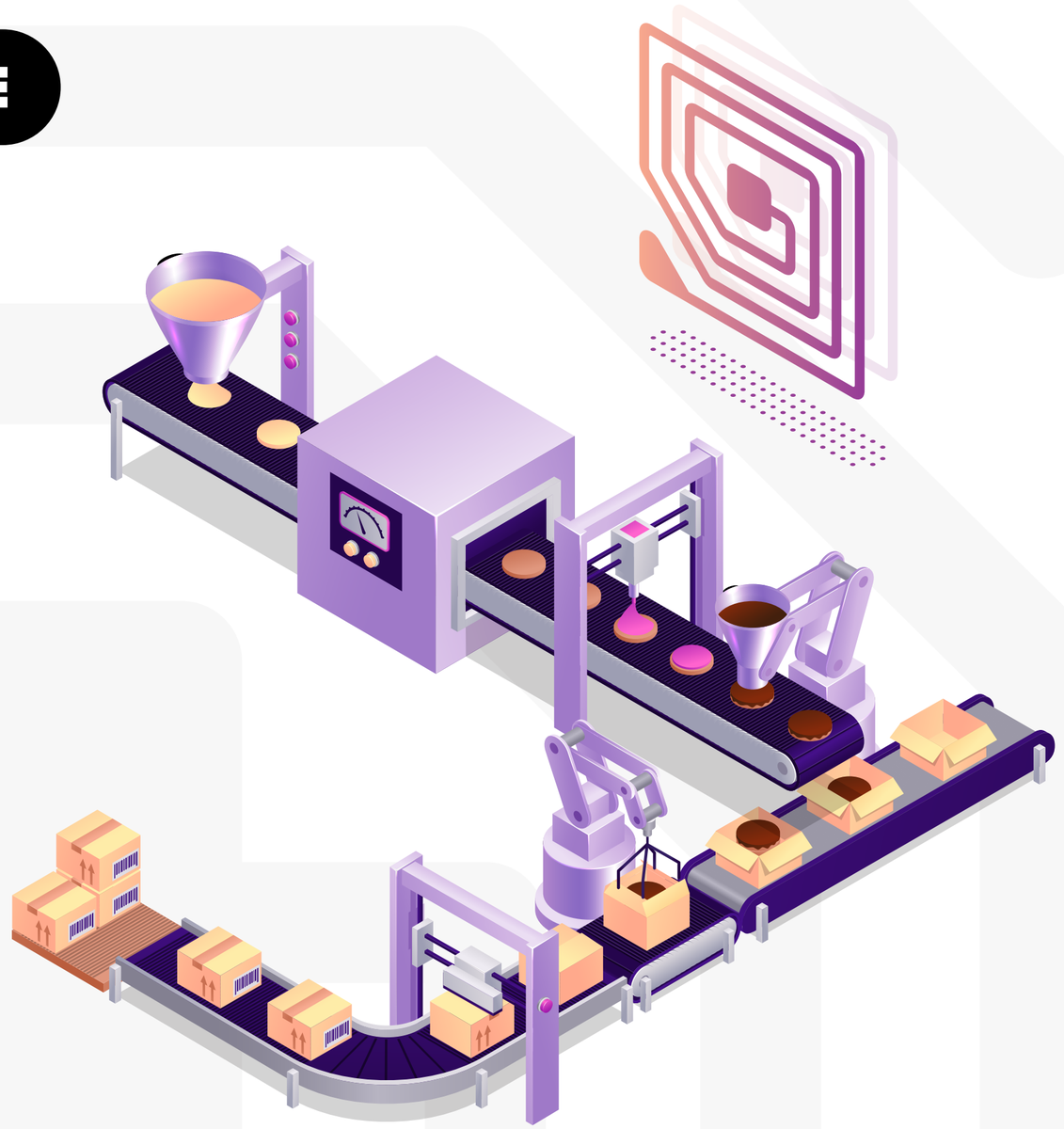
THE FOOD INDUSTRY OPERATIONS GUIDE

Leveraging RFID for Traceability

Maximize productivity, enhance accuracy and improve efficiency with RFID solutions from AbeTech.



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A single contaminant during the food manufacturing process can wreak havoc on the entire supply chain. Manufacturers must notify distributors, wholesalers and regulators about any contamination issue. Retailers must pull product from shelves and in some cases will remove the manufacturer's entire product line.

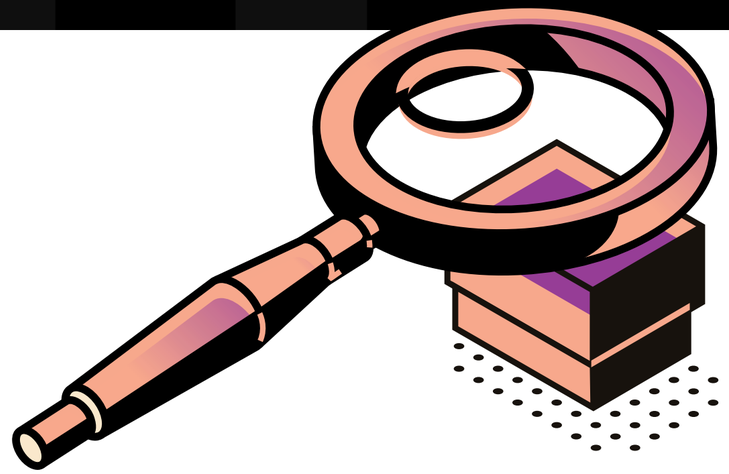
The cost is significant, when you consider the following FDA statistics from 2019:

20,427,455
Pounds of food recalled

124
Total food recalls in the U.S.

34
Recalls for extraneous materials (the leading cause)

32
Recalls for undeclared allergens (the second-highest leading cause)



In the U.S., foodborne illnesses cost $55.5 billion to $93.2 billion annually due to medical costs, lost economic productivity and deaths, according to an Ohio State University study.

The ability to track and trace food from farm to fork has become a priority for many food processing manufacturers to ensure quality, safety and consumer confidence, while reducing the impact of recalls. Real-time tracking technologies, such as RFID, are becoming key tools in this strategy.

Consider that 41% of industry decision-makers say they use RFID tags to improve food traceability within the supply chain, tops among all other technologies cited in a Zebra Technologies survey.

Food Quality Check:

A **RECIPE** FOR **SUCCESS**

Food traceability often starts with the individual ingredients. Tracking ingredients is important for several reasons:

1

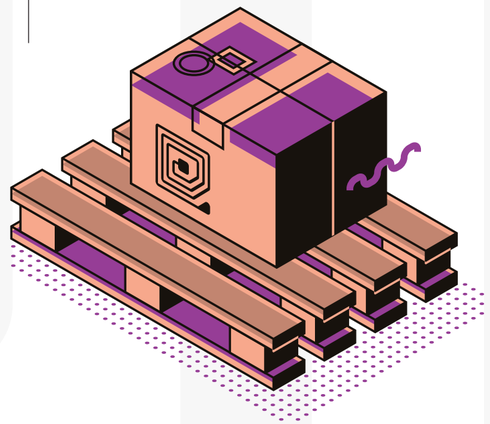
Consumer confidence: Increasingly, customers want to know what's in their food. They're demanding that manufacturers verify labeling claims, such as gluten-free, organic or non-G.M.O.

2

Quality: Ingredient traceability can help manufacturers identify the source of a quality issue if one particular ingredient is the culprit. It also helps to ensure product consistency, especially with demand for exotic foods, which may include multiple ingredients from different countries.

3

Increased plant floor visibility: Having more visibility on the plant floor helps manufacturers optimize inventory levels and ensure materials are available when needed.



Achieving this level of transparency remains a challenge for food processing companies. Many manufacturers continue to rely on paper-based manual processes. Barcodes have provided some level of visibility for the food and beverage industry, but they have limitations.

Barcodes vs. RFID: Benefits and Challenges

The differences between barcodes and RFID tags are most evident when comparing data-capture and readability capabilities. For example, RFID technologies can bring a much higher level of transparency across the supply chain by enabling the capture of expiration dates, batch numbers and lot numbers. RFID tags also hold more information than barcodes.

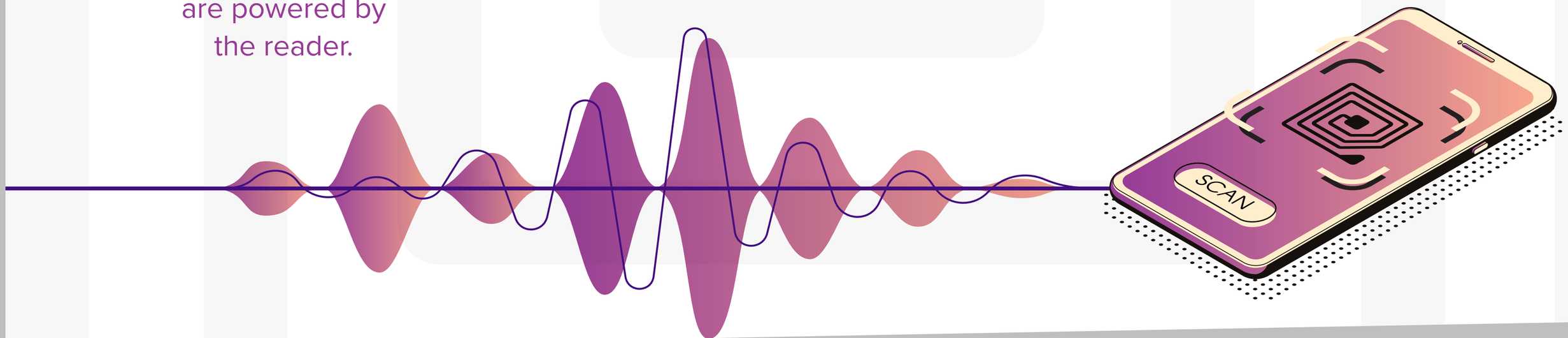
CAPABILITIES	BARCODES	RFID
Line of Sight	Scanner must have a clear, unobstructed view of the barcode to read it.	Not required for RFID readers. They can read tags up to 300 feet away in some instances.
Durability	Less durable in harsh conditions. May tear, wrinkle or fall off.	Many RFID tags are weatherproof and are able to withstand chemical exposure and extreme temperatures.
Data Capture	Typically limited to 20 characters of information.	An RFID tag can include up to 100 times more data than barcodes, such as product origin, lot and expiration dates.
Productivity	Labels must be scanned individually.	Readers can scan up to 200 tags simultaneously.

RFID in Food Processing

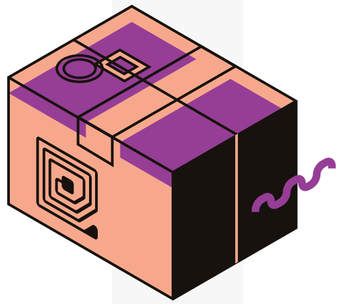
HOW IT WORKS

RFID tags can be active or passive. An active tag is battery powered, while passive tags are powered by the reader.

RFID uses readers with antennas that send radio waves and receive signals from RFID tags, which store various pieces of information about an asset. Unlike barcodes, RFID tags don't require manual, line-of-sight scanning by a user to read the tags. Readers can be mobile so that they can be carried by hand, or they can be mounted on a post or overhead. Reader systems can also be built into the architecture of a cabinet, room, or building.

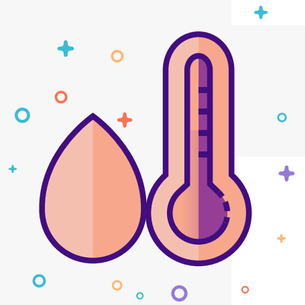


passive vs. active



passive tags

In the food processing industry, manufacturers may use passive tags to track bulk items, such as bins or pallets, as they move through a warehouse or plant floor. Each time a bin passes through an RFID read field, the readers collect and send information to a database. This provides an audit trail for the items, including which line produced it, when the product was produced and which machines were used. In the event of a recall, a manufacturer could use this information to quickly identify affected batches instead of pulling all the products from store shelves.



active tags

Active tags are valuable to food manufacturers as well because they allow them to collect information about environmental conditions, such as temperature and humidity. This is particularly useful for perishable items. The RFID tags can alert the manufacturer to any deviation from acceptable temperature thresholds. Active tags are typically more expensive but have a greater readability range, making them also ideal for the tracking of high-value assets, such as machinery.

RFID Middleware

BRINGING IT ALL TOGETHER

The tags and readers provide the asset or item information and data-capture functionality. But users still need systems that process and make sense of the data. This is where middleware solutions come into play. Middleware is software that seamlessly connects RFID readers, such as Zebra handheld or fixed readers to your systems and processes.

Middleware can:

- Configure readers
- Process tag data
- Integrate with back-end systems in real time

Zebra – Your RFID Hardware Partner

Zebra has decades of expertise, design and software development with RFID, backed by a suite of hardware options to create a consistent traceability process in your operation.

- Handheld readers for mobility and on-the-to visibility
- Fixed readers and infrastructure for pinpoint location of tagged assets
- RFID antennas for high traffic and precision inventory/asset tracking

Enhanced RFID Asset Tracking

Unleash the power of location data with actionable insights. Improve inventory accuracy and streamline product workflows with RFID locationing technology and services.

Inventory Management | **Work in Process** | **Yard Management** | **Asset Tracking**

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To learn how your enterprise can leverage RFID solutions that improve traceability and increase the bottom line, contact one of our AbeTech specialists to arrange a free consultation.

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