

GETTING FROM  
**FARM 2 FORK**

Without Losing  
Your

*Cool*

A GUIDE TO

**DIGITAL COLD CHAIN  
TRACEABILITY**



# THE COLD, HARD TRUTH ABOUT FRESH FOOD TRACEABILITY

The transparency, traceability, and trust of the fresh food cold chain has never been more critical than it is today.

Consumers expect the participants in the food supply chain— **especially those involved with perishable foods like fruits, vegetables, meats, and fish**—to have good agricultural, production, and handling practices in place to safely handle food and provide quick identification, location, and withdrawal when problems are suspected or confirmed.

In response to this consumer insistence, governments have enacted rules and regulations to better protect public health as it relates to fresh food products. The **US Food Safety and Modernization Act (FSMA)** of 2011 introduced preventative measures and proactive modernization, including regulations on enhanced record keeping requirements, encouraging the use of technologies to streamline and digitize traceability.

Food producers, distributors, and merchants note challenges in compatibility between systems, personnel limitations, and budget availability as blockers to adopting digital traceability. As well, an out-of-balance risk versus value perception is keeping many companies from pursuing cold chain track-and-trace technology. Luckily, many of these barriers are beginning to subside as the technology matures and its suppliers find ways to decrease the pain and cost associated with adoption.

**76** MILLION

or 1-in-6 Americans Suffer from  
Foodborne Illness Annually

Source: United States Center for Disease Control:  
<https://www.cdc.gov/foodborneburden/2011-foodborne-estimates.html>

**\$15** BILLION

in added food costs as a result  
of purposely mislabeled imports

Source: Grocery Manufacturers Association

# 4 REASONS WHY FOOD TRACEABILITY HAS NEVER BEEN MORE IMPORTANT

So, why are leading businesses involved in the fresh food supply chain adopting **digital traceability technology** despite the noted challenges? What is to be gained or lost by avoiding or embracing this consumer-led industry trend?



## QUALITY

- According to the CDC, there are more than **76 million cases of food borne illnesses in the US every year**, resulting in 325,000 hospitalizations and 5,000 deaths.<sup>[1]</sup>

<sup>[1]</sup> [https://wwwnc.cdc.gov/eid/article/5/5/99-0502\\_article](https://wwwnc.cdc.gov/eid/article/5/5/99-0502_article)

<sup>[2]</sup> <https://www.foodengineeringmag.com/articles/98984-food-fraud-is-not-only-an-economic-drain-but-also-a-supply-chain-safety-concern>

<sup>[3]</sup> <https://post.parliament.uk/research-briefings/post-pn-0624/>

<sup>[4]</sup> <https://www.prnewswire.com/news-releases/reflections-on-recalls-five-years-of-the-stericycle-expert-solutions-recall-index-300594063.html>

## FRAUD

- The Consumer Brands Association estimates that **food fraud may cost the industry \$15 billion annually** and affect up to 10% of the global food supply.<sup>[2]</sup>
- Some estimate that **food fraud is a \$40 billion global problem.**<sup>[3]</sup>

<sup>[5]</sup> <https://www.food-safety.com/articles/2542-recall-the-food-industrys-biggest-threat-to-profitability>

<sup>[6]</sup> <http://www.fao.org/3/mb060e/mb060e00.htm>

<sup>[7]</sup> <https://www.fda.gov/food/consumers/food-loss-and-waste>

<sup>[8]</sup> <https://www.fda.gov/food/consumers/food-loss-and-waste>

<sup>[9]</sup> <https://www.pbs.org/newshour/show/americans-waste-up-to-40-percent-of-the-food-they-produce>

## RECALLS

- **Recalls have increased 92.7 percent** since the FDA rolled out its Food Safety Modernization Act (FSMA).<sup>[4]</sup>
- The **average recall costs \$10 million** and can take weeks to track through the supply chain.<sup>[5]</sup>

## WASTE

- Each year, it's estimated that **1.3 billion tons of food is wasted.**<sup>[6]</sup>
- In the United States, food waste is estimated at between **30–40 percent of the food supply.**<sup>[7]</sup>
- It's believed that **\$160 billion worth of food is wasted in the US annually.**<sup>[8]</sup>
- Approximately **40% of all food produced goes to waste.**<sup>[9]</sup> In the distribution stage, waste is due to **transportation damage, cold chain deficiencies, and incorrect and ineffective packaging.** In the retail stage, waste is due to food safety concerns and inconsistent/confusing data labels.

# MUST-HAVE FEATURES

## of a Cold Chain Track-and-Trace Solution

Not every track and trace solution offers the same feature set, nor will each be guaranteed to meet the specific needs of a business in the food production of distribution space. However, **there are several critical features and functions you'll want to ensure are a part of any solution you choose to implement.**

### KEY FEATURES TO CONSIDER

- Real-time serialized item level visibility and traceability tracking at the aggregation, and granularity to drive your return on investment
- Temperature excursion management
- Automated hold/recall isolations
- Change of custody/track-and-trace visibility
- Business conformity and regulatory compliance
- Robust analytic and business intelligence tools
- Robust reporting features
- Integration with other critical line-of-business applications such as WMS and ERP
- Business growth and adaptation to future regulatory requirements such as FSMA 204



# HOW DIGITAL TRACEABILITY WORKS FOR COLD CHAIN

One digital technology, UHF RFID combined with industry standard GS1 labeling, has unique capabilities and advantages over traditional barcoding to provide serialized, at distance, non-line-of-sight reads and validation of key data elements to verify temperature sensitive products meet acceptance criteria from source to destination.



Food products are **labeled at the carton or pallet level with a GS1 compliant Ultra-High Frequency (UHF) RFID tags** which enable bulk counting of items from long range.



Food products are **digitized with various markers, and optional condition monitoring sensors to create a 'digital birth certificate'** that uniquely ties products to their origins for accurate visibility, and traceability and if business case supports - optional temperature and freshness monitoring.



The data from the marker is then **populated into the track-and-trace cloud software, ready to be used for analytics and business intelligence**

## CASE STUDY:

# GETTING A HANDLE ON TEMPERATURE RELATED CLAIMS

Now that we understand how RFID technology enables track-and-trace for the cold chain, let's take a look at a practical application for this advanced technology.



## THE CHALLENGE

A leading US premium beef producer was facing issues with its supply chain and needed to ensure it sent the right product in the correct quantity, weight, and freshness to the right customer. Additionally, the producer wanted to implement claims control for temperature excursions in transit. Finally, upon implementing a new solution, the producer wanted to ensure it was communicating its value proposition of high-quality and freshness to consumers.

## THE SOLUTION

To address its needs, the beef producer worked closely with PLM Fleet, a **temperature track and trace solution provider**. **PLM TrustLink™** digitizes the cold supply chain and provides temperature tracking, real-time inventory counts, accurate scanning, item location features, systems integrations and more.

- GS1-compliant Ultra-High Frequency (UHF) labels were used to capture the food's source, serialized ID, production date and weight.
- Ambient air temperature sensors were implemented to track pallets during transit.
- The **PLM TrustLink™ mobile app** and web portal provided track-and-trace and excursion monitoring.

## THE RESULT

With the new solution, the producer gained new visibility, traceability and recall support. It improved right product delivery to customers, and it also **saw a reduction in temperature excursion claims**. Finally, brand communication to customers was improved for their premium beef..

## RECOMMENDED SOLUTION



# for Cold Chain Traceability

PLM TrustLink™, the premier cloud-based IoT platform, answers the 3 T's facing those in the food supply chain: **Transparency, Traceability** and **Trust**.

Organizations can have connected end-to-end case visibility throughout their entire cold chain ecosystem from farm to fork using one solution.

- Provide track and trace for serialized pallet, case and item level products
- Capture hand-off receipts
- Automate hold/recall isolations
- Prevent upstream issues from reaching end customers
- Enable temperature excursions monitoring
- Integrate into existing ERP, WMS, and inventory management systems



Speak with a Cold Chain  
Technology Expert

Contact Us Today



 **ZEBRA**  
UHF RFID Technology



# Food Safety

# Transportation

# Checklist

**The Food Safety Modernization Act (FSMA)** was signed into law on January 4, 2011 vests the Food and Drug Administration (“FDA”) law enforcement authority to achieve higher rates of compliance with prevention and risk-based food safety standards, including for transportation.

If the FDA knocked on your door asking for documentation on your proactive process, procedures and compliance? Could you produce it in a timely manner? Are you spending too much time on manual effort using antiquated paper process to be compliant? Are you ready for upcoming FDA’s FSMA 204 rule?

## WHAT’S REQUIRED BY FSMA:

- Design and maintenance of transportation equipment** to ensure that it does not cause the transported food to become contaminated
- Ensure **food is not contaminated through gaps in temperature controls** and separation of food from nonfood items in the same load
- Reporting procedures for prior cargos, cleaning of transportation equipment, and **temperature control between the shipper, carrier, and receiver**
- Written procedures and records retention** related to transportation equipment cleaning, prior cargos, and temperature control
- Training of carrier personnel in sanitary transportation practices** and documentation of the training

## WHAT YOU SHOULD BE DOING NOW:

- Ensuring on-going cleanliness, maintenance and proper design of trailers  
Updating replacement cycle
- Actively using temperature management & control system in all trailers
- Reporting from shipper to carrier to receiver and on demand.  
**Example retention policy:** Transporters 12 months, warehouse 2 years.
- Documenting your refrigerated fleet management plan, including preventive and proactive actions  
**Example retention policy:** Transporters 12 months, warehouse 2 years.
- Training all transportation employees in proper operations