# Comparing Pallet- and Trailer-level Temperature Monitoring

Implications on Quality, Freshness, Traceability and Profitability for Retail Grocers

Global losses of perishable foods accounts for an estimated $35 billion annually – half of which can be attributed to improper temperature management in the cold supply chain. Some retailers lose millions of dollars a year in just a single product category due to shrink and waste due to spoilage. Why is there so much loss? Why is it tolerated? What can be done about it?

There are several reasons. To begin with, many retailers rely on visual inspections and/or USB- or paper-based trailer-level ambient data loggers to determine the quality and freshness of products when they are received at the retail distribution center or individual grocery stores. Case studies and academic data confirm that this approach is error-prone and inadequate for accurately determining quality and freshness, as each pallet has its own unique temperature profile and history due to harvest conditions, pre-cooling, storage, handling and variations during shipping.

## Visual Quality and Actual Quality
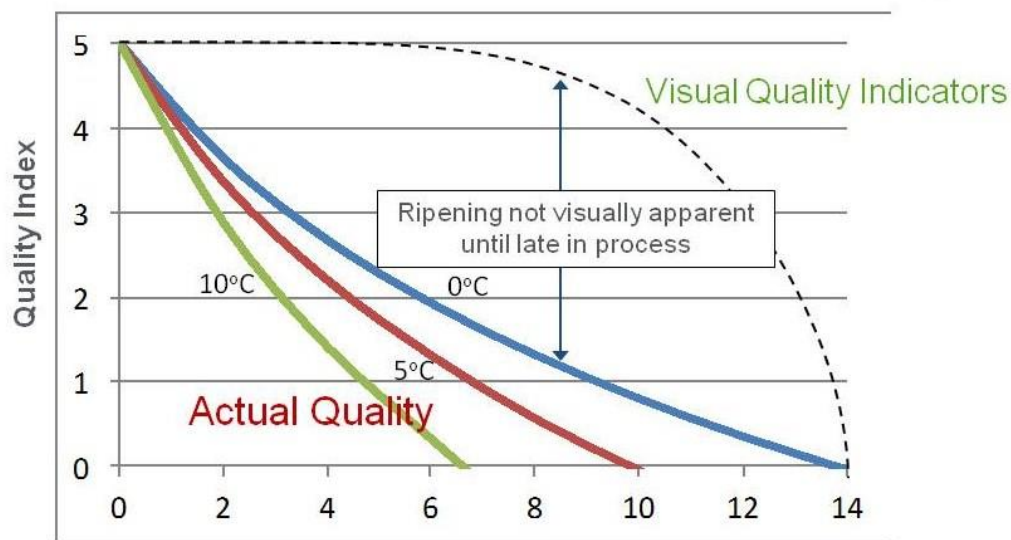
Visual inspection is a poor indicator of *remaining freshness*
- Spoilage isn't visually apparent until it is too late to do anything

Visual inspection is a *lagging* indicator of quality. Most perishable foods look fine until just before they're about to spoil meaning that product that may look fine one day may be shrinkage the next. USB- and paper-based loggers can identify problems only after they have occurred, when it is too late to take corrective actions to prevent loss and ensure freshness.

The Zest Fresh™ solution provides actionable data (we call it the ZIPR Code™ for Zest Intelligent Pallet Routing). It is the first industry standard metric for proactively managing the cold supply chain to prevent losses due to temperature issues before they occur. As a result, using Zest Fresh and the ZIPR Code, retail grocers experience less waste due to spoilage after product is received and accepted by the retailer, which leads to increased profits, more satisfied shoppers and increased brand value.

Comparing Pallet-level and Ambient Trailer-level Monitoring

The following diagram provides a clear example of the variances that can be found between pallet-level and ambient trailer-level monitoring. The black line reflects the ambient temperature in a single trailer of berries over the course of a five-day journey from Mexico to California. In the diagram, according to the ambient monitor, the trailer was maintained at an acceptable temperature throughout the duration of the trip. However, as indicated by the pallet-level wireless temperature monitors placed in each of the 26 pallets in the trailer, there was *significant* variation, with five pallets experiencing temperatures during the trip that would have an adverse impact on quality, freshness and remaining shelf life. Pallet 10, for example, aged 9.5 days over the five day trip due to its temperature. Relying on visual inspection and the ambient monitors, which are lagging indicators, would not provide the data to proactively manage these variations or identify the specific pallets that were at risk and required special handling.
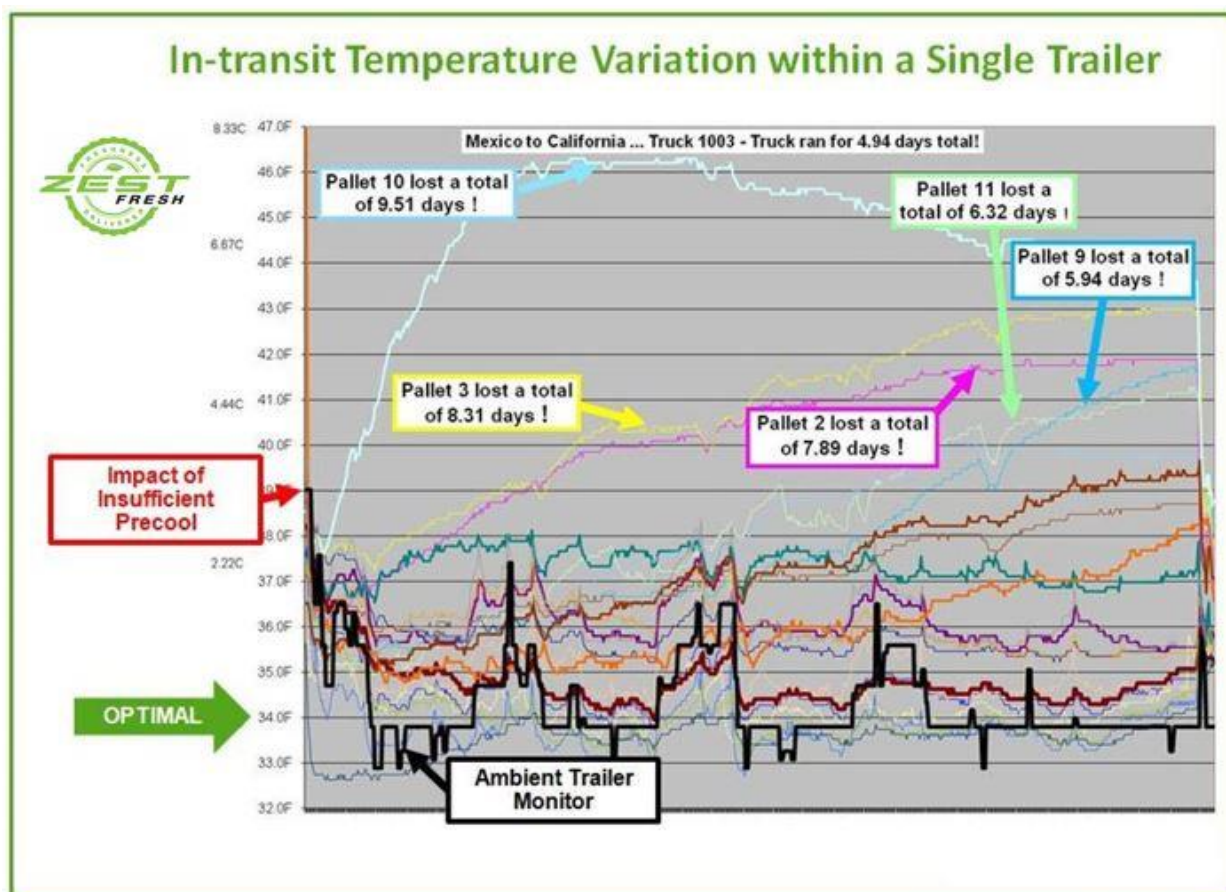
Rather than treating the entire shipment equally, pallet-level temperature monitoring provides the ability to automatically identify those pallets that require special handling and implement a First Expired, First Out (FEFO) inventory system to prioritize routing to sell those pallets with a lower relative remaining shelf life first. This information also enables retailers to better understand the quality and delivered freshness of the product that they receive from suppliers, and helps the distribution center to improve inventory management and shopper satisfaction.

FMI studies consistently state that the quality and freshness of produce, meats and seafood is a top reason that consumers select their grocery store. Unfortunately, the current methods of visual inspection and trailer-level data loggers results in excessive waste, poor quality and lost profits.

Zest Fresh enables easy data sharing within an enterprise or among supply chain partners, real-time notification and alerts for exception-based proactive supply chain management, and analytics for improving supply chain processes. Zest Fresh wireless temperature monitors can be used for two years or more for a powerful and compelling ROI, and provide a complete electronic traceability record to help address pending Food Safety Modernization Act track-and-trace requirements.

For more information on how innovative cold chain suppliers are addressing food loss, please download this white paper from ChainLink Research: *Winning the Freshness Wars.*

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