



The ZIPR Code Freshness Metric

Dynamically providing the current freshness of each pallet to help you intelligently manage product and reduce shrink throughout the fresh food supply chain

The **Zest Intelligent Pallet Routing Code (ZIPR Code)** is the industry's first freshness metric and is a component of the Zest Fresh™ solution. The ZIPR Code, introduced in January 2017, is a dynamic date code that empowers workers and systems to better manage product based on actual freshness, rather than relying on the false assumption that the harvest date label accurately represents remaining freshness. Zest Fresh includes autonomous product condition data capture for each pallet of produce from harvest to retail. Wireless IoT temperature sensors, inserted into the pallets at harvest, monitor the product's condition and processing and, combined with cloud-based artificial intelligence, machine learning and predictive analytics, dynamically calculates the ZIPR Code providing growers, shippers and retailers with a freshness metric that improves inventory and distribution management.

The ZIPR Code is dynamically calculated and provides you with the current freshness of each pallet to help you intelligently manage product throughout the fresh food supply chain. Using the ZIPR Code, growers, shippers and retailers always know the remaining days of shelf life for each pallet of produce to enable intelligent decision making that reduces waste and ultimately improves product margins.



The ZIPR Code is:

- A dynamic, real-time calculation of the days of remaining freshness or shelf life.
- Continuously updated for each pallet, as quality and freshness can vary by pallet, even within a single day's harvest.
- A goal-oriented metric for freshness requirements.
- Normalized to easily implement across product categories.
- Specifically calculated for every product, from strawberries to lettuce to broccoli, etc., based on variety, harvest location and product specific profile.

The ZIPR Code product profile is based on actual product samples to reflect product specific data, such as harvest quality, and product aging rates that are unique to the variety, field conditions and micro-climate. The product profile defines the freshness capacity and the rate of aging which are both used to evaluate pallet-level condition data, driving dynamic updates of the ZIPR Code for each pallet. Zest Fresh then uses the ZIPR Code to best match available pallets with customer requirements and transit

times. That is, if you know one pallet has nine days of remaining shelf life and another has twelve, they can be intelligently prioritized to locations that match the freshness with the transit time.



Zest Fresh uses two independent ZIPR Codes – target and actual. The ZIPR Code represents the earliest date on which the product is forecast to spoil.

- Target ZIPR Code: This is based on the customer requirements and sets a target for the earliest date on which the product may spoil. For instance, if a retailer requires 2 days for distribution (DC to store), plus 2 days for store sell through, and 5 days for the consumer use, that would be a minimum of nine (9) days of delivered shelf life. As the retailer may have DCs in very different locations, the transit time from the supplier to DC is added. A cross country trip of 5 days in addition to the 9 day requirement means the supplier must ship with a minimum of 14 days of shelf life. A local DC may only require 10 days of shelf life. Zest Fresh understands these requirements and translates them into a target ZIPR Code for each purchase order (and each item on the purchase order). This provides the supplier with a target for each pallet’s actual ZIPR Code to meet to ship to be approved to ship to that location or purchase order.
- Actual ZIPR Code: Each pallet tracked in Zest Fresh will have a ZIPR tag, which captures the handling condition data for that pallet. The ZIPR tag also includes a unique ID, which Zest Fresh uses to track the pallet and its associated actual ZIPR Code. This actual ZIPR Code is based on the freshness capacity (total ideal shelf life) for the specific product, which is then modified by the actual processing and handling condition data, referenced against the product profile, to determine the pallet’s actual ZIPR Code. The result is that the pallet’s actual ZIPR Code is much like a dynamic data label. For example:
 - The retailer sets 1 day for the grocery distribution center, 2 days store sell-through, and 4 days for consumer = 7 day destination requirement.
 - Transit time added to destination requirement results in target ZIPR Code for a specific shipment. (i.e. 5 days + 7 days) = 12 days.
 - Zest Fresh screens available pallets by selecting pallets with actual ZIPR Codes that meet or exceed the target ZIPR Code. That is, if the retailer’s requirement is that the product must remain fresh until 12 days from the current date, Zest Fresh identifies only those pallets that

have a ZIPR Code of that date or later. Pallets with a lower ZIPR Code reflecting an earlier date, would be allocated to retailers with shorter shelf life requirements, or possibly to restaurant use (where product is consumed more quickly).

The supplier loads the trailer with pallets that have compliant actual ZIPR Codes. There's no action required from retailer – Zest Fresh, using the ZIPR Code, provides automatic compliance checking. If exceptions are needed, Zest Fresh can escalate the request to retailer for permission. The target ZIPR Code may be modified for each purchase order, accommodating some variance in requirements due to seasonality.

Zest Fresh uses real-time analytics to empower suppliers to maintain consistent processes and handling, improving the freshness consistency of its products. Real-time corrective action notifications empower the supplier's workers to correct for product not being handled or processed properly. This same data provides the supplier with guidance to maintain optimum operating efficiency, saving money and increasing throughput.

Zest Fresh uses machine learning to improve the actual ZIPR Code forecasting based on real world results. The changing of pre-harvest and harvest field and weather conditions can vary the impact of post-harvest handling, so Zest Fresh tracks these trends and adjusts the forecasting to match actual results. The combination of product profiling based on actual samples and the machine learning from actual results provides a dynamic forecasting model that accommodates the variations in nature.



Benefits of a More Intelligent Supply Chain

Using Zest Fresh and the ZIPR Code, growers, shippers and retailers are armed with dynamic up-to-date knowledge about the produce as it moves through the supply chain to store shelves and to the consumer. Zest Fresh provides a level of intelligence that cannot be provided by trailer-level temperature recorders, temperature pulsing, photo analytics or visual inspection. In fact, it is those “tried and true” methods that have led to the massive amount of waste that eats away at product margins for retailers today. Only Zest Fresh provides retailers with the information they need to cut waste and deliver freshness.

Read the ZIPR Code Freshness Metric announcement [here](#).

For more information on Zest Fresh and how it can improve your business please contact us at:

+1 408-200-6500

info@zestlabs.com

Or visit us at:

www.zestlabs.com