



WHITE PAPER



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Start the Year Fresh

Three Goals to Achieve Business Success and Growth in 2018

2018 is going to be a year of tremendous change and challenges for the fresh and perishable food industry. For grocers, there's increased competition with Amazon's purchase of Whole Foods, new entrants from international markets, and new laws regulating trucking that are likely to significantly drive up prices. These factors will put additional strain on already razor-thin grocery margins. And, as margin pressures increase for retailers, this will create additional pressure on suppliers to cut costs. Food safety continues to be a major issue for growers and retailers alike, and technologies such as blockchain and the Internet of Things (IoT) have the potential to forever change our ability to track and trace products as they move through the supply chain. Finally, new food delivery models such as online shopping and "click-and-collect" are reflective of changing consumer buying habits and the way they shop – especially among millennials.

These are Not Predictions

But this isn't a story about predictions for 2018. Rather, this is a story about what you, as a grower, manufacturer or retail grocer, need to do – what you need to accomplish – to grow your business in an increasingly turbulent environment where consumers have a greater variety of choices when it comes to how they shop and the products they buy, and margins are being squeezed progressively harder.

2018 is likely to be so dramatic that simply tweaking your business strategy here and there, or squeezing your costs, won't cut it. You'll need to start drastically reimagining your business to achieve the results that will ensure ongoing business success and growth.

Fortunately, with these challenges come opportunities. According to the [Produce Marketing Institute](#), consumers remain committed to fresh foods, as 75 percent say produce is the most important consideration in determining where to shop, followed by fresh meat, poultry and seafood at 60 percent. This represents an opportunity for competitive differentiation by ensuring freshness, quality and safety to attract and retain shoppers, which can be achieved by increasing end-to-end transparency in your supply chain.

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You need to start the year off fresh with three clear goals to accomplish in 2018:

1. Improve product margins and profitability by setting a waste reduction goal to reduce shrink and implement a plan to achieve it.
2. Achieve true transparency in your supply chain for freshness and safety.
3. Establish a freshness metric for your fresh produce, meats and other perishable items.

These goals are intimately tied to your profitability and creating brand value, which is what will help you emerge from 2018 stronger than you went in. There's a common theme that spans these goals: Being proactive. To remain competitive, every member of the supply chain must move from being reactive when it comes to their product to proactively managing it, and today's technology makes this possible – even easy.

Set a Waste Reduction Goal and Implement a Plan to Achieve It

Why is reducing waste (or shrink) so important? Going beyond the benefits of sustainability and reducing environmental impact, the economic benefits of reducing waste will outpace other benefits in 2018. Reducing waste rapidly, directly and dramatically boosts your fresh product profit margin and therefore your bottom line.

According to the [NRDC's Wasted Report](#), about 15 percent of fresh food revenue is lost for national retail chains. Reducing this number directly improves profitability. For example, let's say a retailer has \$20 billion in annual sales and that 11 percent (FMI average) of revenues are from fresh produce, or \$2.2 billion per year. If about 15 percent is being wasted that's \$330 million being lost to markdowns or going into the dumpster – or almost two percent of revenues are being wasted.

If that waste could be reduced by 30 percent, that's almost a \$100 million savings going directly to a retailer's bottom line. And that's not including savings in labor costs associated with reduced culling of the produce aisles. It also means that suppliers can be more efficient.

Solving this problem requires a fresh way of thinking. Many believe that this waste is occurring at the store and is just a cost of doing business, but neither is true.



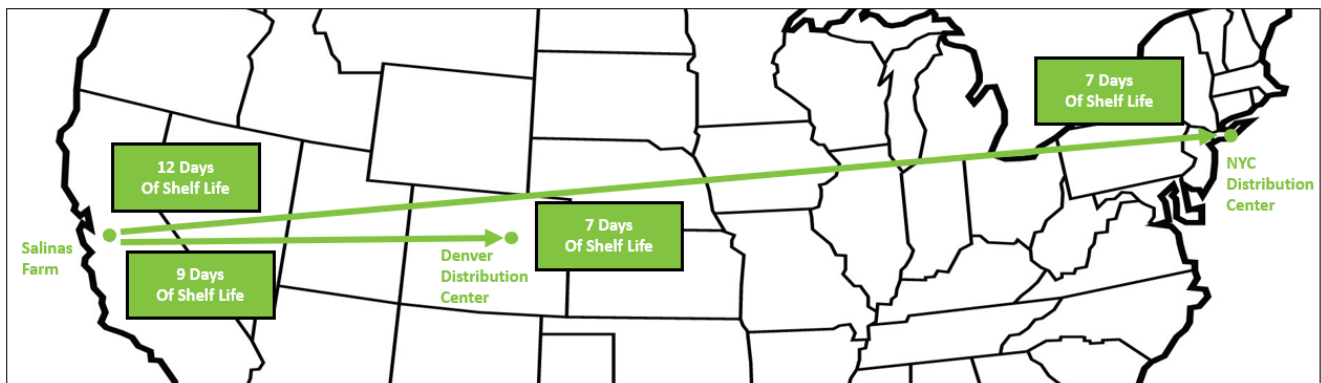
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Reducing produce waste in the cold supply chain means starting in the field, as soon as the product is picked. From that moment on, time and temperature (harvest conditions, cut-to-cool times, precool effectiveness, etc.) are directly impacting the freshness or remaining shelf life of the product that is delivered to the store. For example, if a pallet sits in the field for several hours, the freshness can be impacted by as much as five days, depending on harvest conditions. This impact isn't detected in the field, pack house or even the distribution center, because you can't see it. You can't "pulp" for it. This waste "appears" after the produce arrives at the store even though the issue began far upstream in the supply chain. Reducing this waste means starting in the field and working with growers and shippers to manage freshness at the pallet level. Studies have shown that the majority of shelf life variation is due to a combination of harvest quality and initial processing, where each pallet develops its own unique shelf life or freshness capacity.

This doesn't mean that everyone isn't putting in their best effort to ensure freshness. Rather, the fact that growers and producers currently can't measure freshness, means they aren't managing it, and that results in freshness variability. While we may not be able to control all the freshness variables, we can account for them, and manage and plan accordingly.

By using intelligent IoT temperature sensors, each member of the supply chain can track the condition of the produce beginning at harvest. We can then apply that data to predictive artificial intelligence algorithms to dynamically calculate remaining shelf life. Accurately

predicting remaining shelf life enables intelligent pallet routing. For example, if we know that Pallet A of strawberries has 12 days of remaining shelf life and Pallet B has nine days of remaining shelf life, we can intelligently route Pallet B to a closer location to ensure it has the required seven days of required shelf life when it reaches the store.



Intelligent routing can be done autonomously, without any significant labor or modification to the fresh food supply chain, and with a very positive and rapid ROI. Growers can reduce rejection or soft claim concerns and retailers can reduce waste by 30-50 percent. This challenge also doesn't have to be solved overnight but can be fixed incrementally. Start by identifying an item of the highest value and with the largest amount of waste, such as strawberries. By working together, a couple of growers and one or more of your distribution centers can create a baseline of current freshness, by taking a sample from each pallet received, and holding the sample until it expires, thereby recording the freshness variation currently experienced from pallet to pallet, and load to load. From there, the project can expand to manage product freshness – which provides process feedback, improved inventory rotation, waste reduction and delivered freshness to the store. Once the first product is operationally managing freshness, you can then easily move on to the next product, replicating the success.

There's an additional fringe benefit too – customers will notice more consistent freshness of your produce and that improves brand value and loyalty. The same applies for meats, seafood and dairy as well.

Achieve True Transparency in Your Supply Chain

Because consumers now expect all varieties of fresh produce available year-round, supply chains that were once mostly local are now extended, with product coming from across the country or even other continents. The supply chain can span thousands of miles with product often taking many days or weeks to reach the consumer, directly impacting delivered freshness.

Given this new reality – and the increase in the number of partners along the supply chain – transparency has become both increasingly difficult and important to attain. The more often food changes hands, the higher the chance of mishandling, the less validated the product source, harvest quality and/or farm practices (i.e. organic, sustainable, grass fed, free range,

etc.), and other food safety related processes that can increase the risk of major food recalls. This applies to produce and proteins alike.

Growers, manufacturers and retailers need “true transparency” throughout the entire fresh food supply chain to ensure food freshness, authenticity and safety. True transparency means that all the data that represents the quality, freshness, safety, farming practices, distribution and source of the product is available to the supply chain participants, such that the receiver can directly determine if the fresh food product meets their requirements.

Achieving supply chain transparency has been attempted before but only with limited success due to the lack of standardized data access, increased manual labor in data collection and lack of value for all supply chain participants. Fortunately, a fresh food management solution provides this transparency today, thanks to new technologies that can automate data collection, and standardizes data access through mobile and web interfaces.

The first step in achieving true transparency is gathering the *complete* data about the product at the pallet level – freshness, food safety, and authenticity. It is equally important to continuously monitor the product’s condition (such as the pallet of strawberries, lettuce or meat), not just the product environments (i.e. cold storage, trailer) of the supply chain, from initial harvest through store delivery. For example, knowing the ambient temperature of the trailer provides little value since pallet temperatures can vary widely within the trailer. However, knowing the product’s temperature history enables predictive analytics to determine the remaining shelf life, a critical component to managing freshness, and a key value to all supply chain participants.

The next step to achieve true transparency is determining how manufacturers and retailers collect and store product-related data. There’s immense value in collecting quality-focused data on its own but linking that quality data directly to the relevant pallets or cases makes it actionable throughout distribution. Blockchain is rapidly emerging as an important enabling technology for securely and reliably tracking multi-party product data as it provides an auditable transaction chain of data entries, ensuring all parties share the same view of the current product data. Blockchain, however, should be viewed as a foundational technology not a solution in-and-of-itself. But, given the hype around blockchain and its potential value, you should be developing your strategy in 2018 around how it can be applied to your business. A word to the wise – find an existing use case with a well-defined value proposition and apply blockchain to it rather than start a blockchain project that’s in search of a use case.



Blockchain can facilitate the proactive notification of non-compliant product by utilizing unique identifiers, smart contracts, and including pointers to associated pallet-level product data. The combination of blockchain and the IoT condition monitoring sensor data delivers the ability for growers, manufacturers, distributors and retailers to automate decisions through smart contracts. Smart contracts can evaluate blockchain data for food freshness and safety issues,

and proactively identify and remove products that are a food safety risk based on processing or handling history. Manufacturers and retailers then have the potential to proactively eliminate products at risk before they even reach the consumer, reducing the issues that come from issuing a recall — including cost, consumer safety, damaged brand reputations and decreased customer loyalty.

While there are always challenges to adopting new technology, there are significant benefits for the early adopters that go beyond simply future-proofing. Significantly reducing the risk of food safety liability can improve brand value. Being able to successfully meet the demands of customers for increased insight into the origins, safety and handling of the products they buy will deliver a significant competitive differentiator for growers, manufacturers and retailers alike in the form of improved brand reputation and customer loyalty.

Establish a Freshness Metric for Your Cold Chain

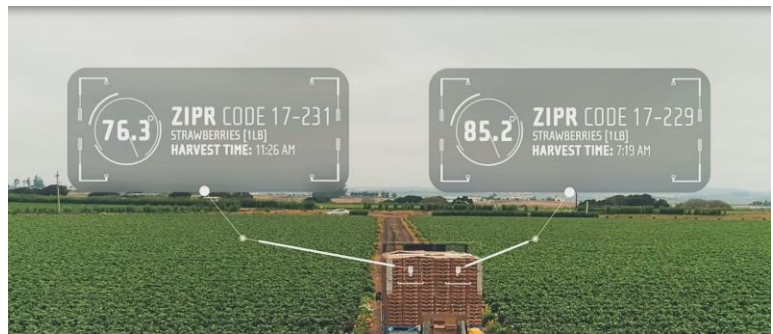
We have metrics for almost everything in business, but we don't have a standardized metric for product freshness. For perishable foods, many rely on date labels which provide the false assurance of an assumed shelf life. These include:

- **Static tests such as pulping, temperature sampling or visual inspection:** Unfortunately, none of these are reliable because they only provide static data of the product at a moment in time. You may be able to assess the current state of the product, but you can't predict the actual (and dynamic) remaining shelf life or freshness capacity. For example, with a visual inspection, the product may look great today, but could spoil the next day. You can't tell because these methods don't tell you how much the product has aged, the current rate it is aging and its remaining freshness. These legacy approaches don't enable intelligent routing to reduce waste.
- **“Best By” dates:** These provide only estimates based on standardized tests and are assigned to an entire lot or crop picked on a given day or given location. The problem is that significant variation occurs at the pallet level and, as mentioned, two pallets harvested on the same day from the same field can have significantly different shelf lives. As a result, perfectly good food is tossed or food with little shelf life left may be sold and quickly go bad for the consumer.

The industry needs to implement a scientifically accurate and dynamic freshness metric. Zest Labs has developed the ZIPR Code (**Z**est **I**ntelligent **P**allet **R**outing Code). The ZIPR Code provides continuous real-time visibility of the remaining freshness capacity of produce and meats, and then directs intelligent routing to optimize delivery for required shelf life, as well as data about the handoffs throughout the supply chain.

The ZIPR Code process starts in the field at harvest or at initial meat processing by capturing relevant data about the product (e.g. variety, location, lot, conditions, etc.) and calculates a “freshness capacity” for the product. That is, given the conditions and the product, the

maximum shelf-life value is assigned. Then, by tracking handling, time and temperature conditions of the product at the pallet level and applying AI-based predictive algorithms, we can produce a standardized metric of remaining freshness (or shelf life) for each pallet. This makes it much easier for growers and retailers to intelligently manage their supply chain by shipping products with longer shelf lives to further locations and products with less shelf life to closer destinations.



The ZIPR Code is a metric for intelligent routing and ensuring delivered freshness.

As previously mentioned, this cannot only substantially help reduce waste, but it can also help optimize inventory management by reducing out-of-stocks or overstocking. It also can help reduce shipping costs by ensuring that only product with the appropriate dynamic freshness are loaded on to increasingly expensive trucks. Why pay the transportation costs of shipping products that will only be thrown away due to lack of freshness?

Start the Year Fresh

Accomplishing these three goals in 2018 will enable you to improve your profitability and create brand value and more loyal customers. You can also enhance your competitive and financial position. By applying technology that helps you proactively manage your cold supply chain, you will:

1. Improve your product margins, improve delivered freshness and reduce shrink.
2. Achieve true transparency in your supply chain to improve food safety and traceability.
3. Utilize a freshness metric that quantifies the freshness you provide to your customers.

About Zest Fresh

Zest Fresh is an automated, cloud-based, post-harvest management solution that ensures delivered freshness, reduces waste and improves food safety. It utilizes IoT and predictive analytics to substantially improve delivered quality and sustainability for growers and grocers. By tracking the handling and quality of each pallet of produce from field through delivery or meat through processing, it dynamically matches retailer freshness requirements with the actual product freshness. Time, temperature and location are wirelessly monitored for each pallet providing visibility for process adherence and determining the best fit to retailers' needs. Zest Fresh enhances the grower and manufacturing workflow by providing visibility through dashboards and mobile applications, suggested process steps, and corrective action alerts. It also provides complete track and trace using blockchain to document that processes were followed to improve food safety.

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