

Powering Perfect Produce with Lenovo and Intel

How Perfection Fresh Australia leverages tech from field to fork to stay on the cutting edge.

As the sun rises over Perfection Fresh's Two Wells farm in South Australia, the light catches the unique swirl of colors of the company's Kumato® tomatoes ripening on the vine. The deep, rich tones of green and purple are just starting to give way to a deep brownish red, a sign that they're ready to be harvested and begin their journey to destinations scattered across the continent. This sprawling glasshouse facility is the largest of its kind in the Southern Hemisphere, and within its 43 hectares grows an almost unfathomable number of tomatoes and cucumbers.

As its name implies, the story of Perfection Fresh is one of an age-old business embracing the 21st century with cutting-edge technology to consistently deliver perfect produce. But to effectively forecast, grow, and distribute these and many other varieties of produce at scale, Perfection Fresh, Australia's largest privately owned fresh produce business, must overcome innumerable variables that impact time, natural resources, and climate.

And the only way to do it is through data.



43 hectares of greenhouse farming space at Perfection Two Wells

"We start collecting data before the seed is even planted," says Francesco Oliveri, Perfection's Chief Information Officer, "Everything from varietal research and development to meteorological and soil conditions on Perfection's many farms. And our success depends on understanding the data, bringing it together, and building the appropriate infrastructure to act on it." To build this infrastructure, Oliveri would come to partner with **Lenovo Enterprise Solutions** to craft a system capable of handling Perfection's ever-evolving challenges—including having enough computing power to process all that data and provide the right insights.



A farmhand examines crop yields for Qukes® baby cucumbers at Perfection Two Wells



"We start collecting data before the seed is even planted [...] and our success depends on understanding the data, bringing it together, and building the appropriate infrastructure to act on it."

— Francesco Oliveri | Chief Information Officer at Perfection Fresh

On the Ground

Perfection has come a long way since its humble beginnings in the late 1960s. Founder Tony Simonetta started the company as a small, family-run garden and market in western Sydney. But he saw an opportunity to grow the business into a wholesale operation in the 1970s, supplying retailers and customers from a network of growers all across Australia. The company now comprises eight massive farming operations across Australia and supplies retailers, restaurants, and even airlines across the whole continent. Through a complex blend of trucking, rail, and air transport, Perfection can deliver even the most delicate perishables to consumers at peak freshness.

An empire, however, is not built on just planting seeds. For a particular fruit or vegetable to make the cut, it must satisfy several key criteria: top-notch flavor and experience for the consumer, yield and crop friendliness for the grower, and resistance to physical threats like climate events, pests, and disease. And even then, a trial run to bring a new product to the market would entail a commitment of two to five years for crop growth and evaluation, so projecting the unique value and mass appeal of a particular product takes great care.



Michael Simonetta | Perfection Fresh CEO

As the Simonetta family forged ahead, they knew the margins for error in agriculture at scale were increasingly narrow and saw that technology would spell the difference between failure and continued success. So Perfection adopted a tech-focused strategy to future-proof the business. This started with enterprise resource planning in 2005, major investments in controlled-environment agriculture in 2007, and a whole-hog integration of analytics and software development in 2014.

On the Grid

Lenovo ThinkAgile VX servers, powered with 3rd Gen Intel® Xeon® Scalable processors that have been optimized for faster analytics, are hard at work parsing data from a variety of sources back in Perfection's head office in Sydney. Temperature, wind speed/direction, humidity, and rainfall information are pulled in through local weather stations. At the farms, IoT sensors stream data from CO2 monitors, moisture sensors, and light meters to track crop yields and growth conditions. Solar IP cameras, location/movement trackers for farm vehicles and storage containers, and labor-tracking software in mobile devices deliver key insights on farm productivity.



A cluster of Kumatoes® on the vine at Perfection Two Wells

This hyperconverged architecture combines robust server hardware with a suite of software solutions that create a single pool of virtualized compute-and-storage resources, streamlining access to every point of data and putting them at the fingertips of farmers and executives alike across the company's expansive operation.

"The perishable nature of our product means that we cannot afford any business system downtime whatsoever," Oliveri explains. "We need an operations infrastructure that can guarantee 24/7 platform availability and a high degree of scalability."

In an offsite location, backup Lenovo ThinkAgile servers don't just offer redundant data security. They allow Perfection to scale the system up on demand without incurring any operational downtime – a highly adaptable and resilient operations infrastructure that simply keeps Perfection growing.

Fresh Data from Field to Fork

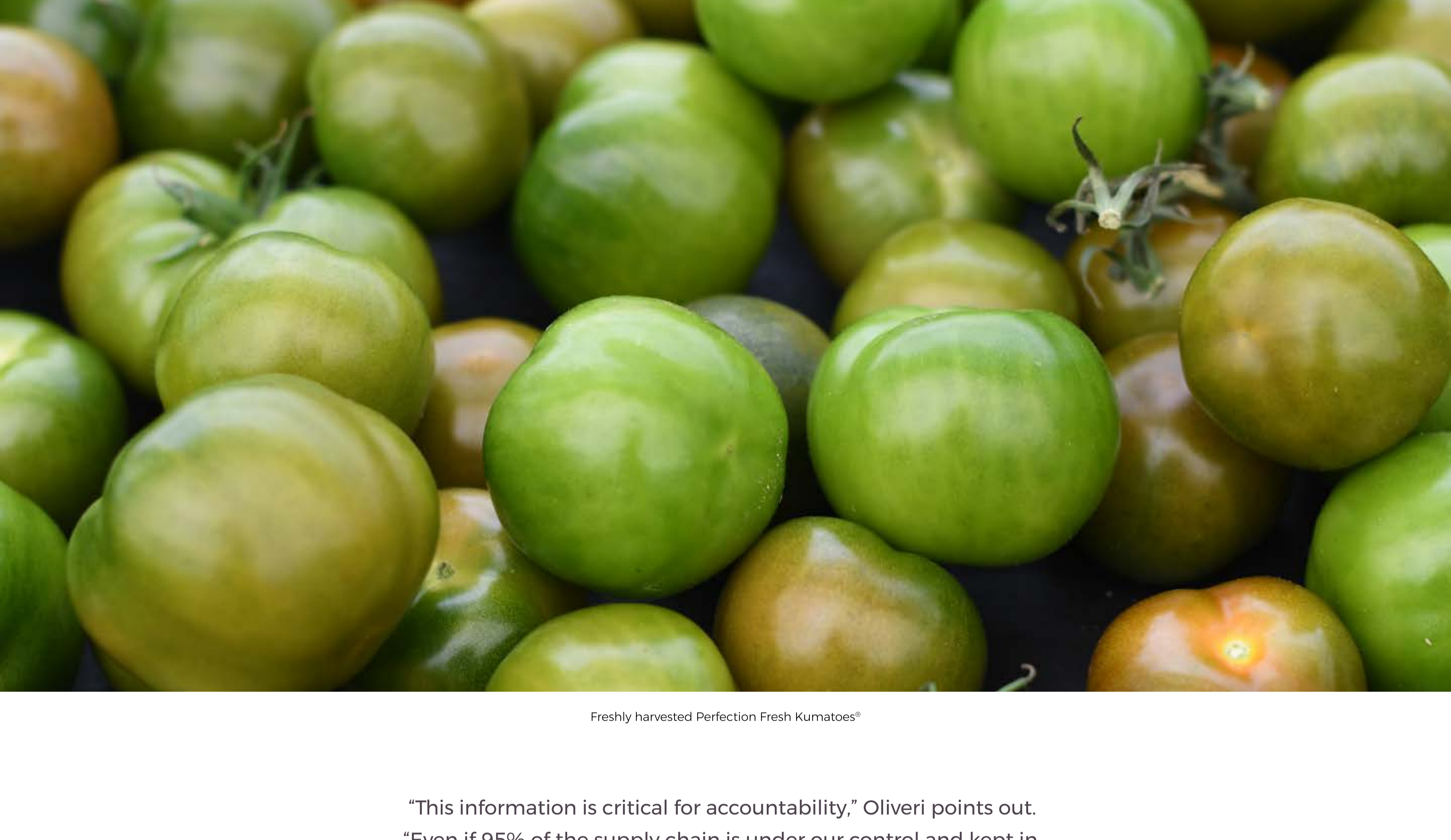
The Life Cycle of a Kumato



On the Road

From the moment the Kumatoes are harvested in Perfection Two Wells, a race against the clock begins. They must be packed, loaded, and processed at a distribution center. From there, the destinations can span hundreds or even thousands of miles. This is an especially perilous phase for perishable goods—unforeseen shipping delays, climate events, and labor fluctuations persistently threaten the timely delivery of a product whose very worth depends on a tightly managed schedule.

To gain an edge in this battle against the unforeseen, Perfection must log and track an entirely different dataset, monitoring geolocation, temperature, and humidity both in real-time and at aggregate levels. This allows them to identify logistical challenges along the route like transportation bottlenecks and prolonged downtime that might affect product quality down the line.



Freshly harvested Perfection Fresh Kumatoes®

"This information is critical for accountability," Oliveri points out. "Even if 95% of the supply chain is under our control and kept in the right condition, the 5% that isn't can cause a great deal of trouble." In the case of more delicate produce like raspberries, using serialized QR codes helps to track dwell time for individual lots—this data allows Perfection to act on supply-chain issues with incredible precision and fine-tune their distribution strategies like never before.

On the Horizon

Even as these plump, perfectly ripe Kumatoes finally reach their destinations and are neatly arranged on grocery shelves across Australia, Perfection knows there are no guarantees for the next crop, the next quarter, or the next big product idea. To stay competitive and relevant, a third and final class of data must be considered: consumer demand and satisfaction. To better forecast consumer behaviors, the company developed its own demand-planning program that helps them game out scenarios for specific products, places, and customers. These insights, combined with promotional sales trends, allow Perfection to develop a well-informed sales and supply plan, engage with their farms and growing partners, and build a robust supply to meet their targets.

But because the goal is to utilize 100% of the crop yields, the company can't simply be reactive to market conditions. They must be proactive in mitigating waste and loss. For a product like tomatoes, this can be accomplished by dividing the yields into separate grades for different end-users: bulk retail packaging, value packaging, and saucing, to name a few. For a product like cucumbers, it can be accomplished by identifying down-chain opportunities like pickling, which dramatically improves the product's shelf life and stretches its value even further.



Crop of Perfection Fresh Qukes® baby cucumbers at Perfection Two Wells

Without the insights afforded by capturing and tracking data throughout the supply chain, cost-saving measures like these would be virtually impossible to enact. And the economic impact is appreciable for food retailers and restaurants alike, whether your customers are peddling produce in bulk or crafting a bespoke artisanal menu, consistency is the bedrock of an enduring partnership.

"Our business never stops... you can't tell a tomato to stop growing," Oliveri says with a chuckle. "And we will never be short on challenges because things will always be changing very rapidly." The implications of achieving even a near lossless supply chain are extraordinary, in part because growers like Perfection can more reliably maximize their crop yields and thread the needle of forecasting demand. These data-driven innovations are also paving the way for more sustainable agriculture when humanity needs it most.

As the world grapples with rapidly evolving pathogens, food insecurity, and unprecedented changes in climate, Perfection's innovations in glasshouse farming and supply chain management are laying the groundwork for the future of mass agriculture itself. And tech powerhouses like Lenovo and Intel are uniquely positioned to help them build a reliable, agile infrastructure capable of rising to these challenges as they modernize their companies to embrace a new era of computing.

"Our business never stops...you can't tell a tomato to stop growing [...] data-driven innovations are also paving the way for more sustainable agriculture when humanity needs it most."

— Francesco Oliveri

If not for a root-level company culture that champions innovation, adaptability, and relentless determination, Perfection Fresh might not have sprung up out of the marketplace in western Sydney so long ago. These qualities are doubtlessly fundamental to the company's continued success. But when you bolster them with the power of data analytics and scalable tech, you can just step back and watch it grow.

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo. Intel, the Intel logo, and Xeon are trademarks of Intel Corporation or its subsidiaries.

