CASE STUDY

SUMMER 2026

U.S. Food Waste Pact

Whole Chain II: Strawberries

Testing Foodservice Application for On-Farm Strawberry Surplus

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Executive Summary

In 2024, a **case study** by the Pacific Coast Food Waste Commitment reported that 25% of all strawberries grown are left behind in the field despite being marketable or edible. Building on that research, the U.S. Food Waste Pact team convened stakeholders from across the fresh strawberry supply chain, including a grower, a distributor, a produce broker, and three Pact signatories—Compass Group, Guckenheimer, and Sodexo—to test the operational viability of utilizing this surplus product in a fresh application for the foodservice sector.[1]

Pilot Goal

This pilot tested whether the surplus strawberries could be operationally viable for both foodservice operators and the grower, while delivering increased revenue for the grower, financial savings for the foodservice operators, and environmental benefits for all.

Key Takeaways

- Surplus strawberries can increase grower revenue while delivering cost savings for foodservice accounts and environmental benefits for all.
- Supply-side innovation and leadership is essential: surplus products cannot materialize through demand alone.
- Despite challenges within this particular commodity, pilot participants are enthusiastic to shift their surplus and imperfect efforts toward heartier, less perishable commodities. Nearly every pilot participant is taking proactive steps to further their commitment to or understanding of imperfect and surplus markets.

Following this case study, the U.S. Food Waste Pact plans to:

- Convene and facilitate a collaborative, cross-supply chain dialogue among growers, distributors, and end buyers for the expanded availability of second-harvest commodities.
- Lead the Pact's Supplier Engagement Task Force to develop standardized resources and best-practice frameworks to support supplier engagement, measurement, and the reduction of upstream food waste.

Pilot Locations and Number of Sites

This pilot tested a solution to strawberry waste in foodservice sites across California.

33 ACCOUNTS PARTICIPATING IN PILOT

3 PACT SIGNATORIES REPRESENTING OVER 25% OF U.S. CONTRACTED B&I FOODSERVICE MARKET SHARE

Successes

Environmental Benefits

Total pounds of strawberries rescued	9,992
Total on-farm loss rate	Reduced by 51%
Total GHG and water intensity reduction	31%
Reduction in plastic clamshell units	50% or 4,996 units of plastic

Financial Benefits

The grower realized an **80% increase in revenue** compared to juicing grade strawberries.

The cost of surplus strawberries was **22.4% lower** compared to No. 1 strawberries for foodservice operators.

Additive strawberry purchases: No. 1 strawberry **volume was not cannibalized** between 2024 and 2025, even with the introduction of surplus strawberries.

Challenges

High rates of product rejection in second half of pilot due to molding and logistical and coordination issues.

Low post-pilot adoption of surplus strawberry SKU.

Pilot Overview

Previously, the Pacific Coast Food Waste Commitment conducted the country's first **collaborative whole-chain pilot project** (Strawberries Part I) on fresh strawberry waste in the supply chain. Strawberries were chosen due to their high value, popularity, resource-intensive cultivation, and perishability. The study revealed that 25% of unharvested strawberries were still marketable or edible and identified a potential pathway for surplus strawberries to reach the human supply chain through a new secondary fresh channel.

Because of retail operations' strict cosmetic standards, Part II of the pilot project tested the solution with foodservice. Foodservice culinary teams routinely transform fresh product back-of-house into a variety of formats. This gives them more flexibility to use different grades of produce than retail, where consumers see the product exactly as it left the field. Despite this flexibility, all foodservice operators involved in the pilot purchase solely No. 1 grade strawberries due to a lack of market alternatives from distributors. The corporate dining segment within contracted foodservice is particularly well-suited to testing this kind of solution, given client demand for culinary innovation and operational scale.

The pilot took a whole-chain approach, testing operational viability for both growers and foodservice operators. It examined whether concurrent harvesting could deliver increased revenue for growers, cost savings for operators, and environmental benefits across the chain—specifically, whether higher-quality strawberries that might otherwise go to juicing or frozen channels, or be left unharvested, could instead be redirected to a higher-margin secondary fresh channel focused on product utilization, efficiency, and waste reduction.

Three Pact foodservice signatories—Compass Group, Guckenheimer, and Sodexo—engaged 33 corporate dining accounts across Northern and Southern California over a seven-week period from July through September 2025.

Strawberry Grades

Strawberry grades[8] are determined by cosmetic (firmness, ripeness, shape, size, color) and safety (product quality indicated by bruising, pest damage, decay, etc.) standards.[9]

No. 1 (fresh): Strawberries that meet both cosmetic and safety standards for consumption.

No. 2 (fresh): Strawberries that meet the safety standards for consumption but do not meet appearance, shape, or sizing standards for No. 1 grade.

Combination (fresh): Combination of No. 1 and No. 2 strawberries with at least 80% by count of the strawberries meeting the requirements of No. 1 grade.

Frozen:[10] Uniformly red and ripe, caps removed, individually frozen.

Juicing:[11] Fruit destined for juicing meets safety standards for consumption but cannot be used in a fresh context due to severe cosmetic defects like still being green, overripe with soft spots, misshapen, or significantly undersized.

Source: USDA

Anonymous Grower

A grower's goal is to maximize berry volumes sent to market, particularly fresh No. 1 berries that capture the highest price. Frozen and juicing are both relatively well-established channels that provide a valuable revenue stream and reduce on-farm waste. Testing a new secondary fresh channel of surplus berries created a price point between fresh No. 1 grade and frozen and juicing grades. For this pilot, the grower adopted a concurrent harvesting approach—picking surplus and No. 2 strawberries alongside No. 1 berries but packaging them separately—to maximize labor efficiency. Anecdotally, concurrent harvesting practices have additional advantages, including cleaner fields that reduce "slips, trips, and falls" hazards for pickers, as well as reduced pesticide use.

Successes

The pilot yielded a 51% reduction in the total strawberry loss rate measured using the **Global Farm Loss Tool**. The resulting environmental benefits included a 31% reduction in greenhouse gas emissions and water use intensity due to increased fruit harvested.[2] The grower also saw significant financial gains, receiving 80% more per pound than juicing grade—**even on par with the average No. 1 grade price.**[3]

Challenges

Despite the strong financial and environmental results, pilot implementation manifested several growing pains for the grower. On the financial side, while the pilot's concurrent harvesting approach nearly doubled revenue per pound, the benefits were offset by the high labor costs of non-standard packing and the logistical disruption to operations. The grower's infrastructure also created a bottleneck, as their existing cooling facilities struggled to accommodate the additional space required by the pilot's small-scale, pack-to-order model. To achieve commercial viability, the grower indicated they would need to transition to packing strawberries directly into reusable juicing trays (known as reusable packaging containers), which is their standard practice, and receive increased administrative and logistical support from their parent company, including cooler space and bulk packaging prices.[4]

> *"Much of the loss, like that due to small size, is still good quality and good eating fruit, but is being completely wasted as a result of the economics not being there to support harvesting it."*
>
> — GROWER

Anonymous Multinational Distributor

Successes

The distributor has a robust imperfect and No. 2 program, having carried a variety of heartier commodities for years—including avocado, jalapeños, cucumbers, eggplants, ginger, garlic, peppers, and potatoes. The distributor's goal is to support innovation on food waste along the supply chain and to satisfy their customers' demand for additional imperfect products.

Challenges

A distributor's brand is built on trust from foodservice customers that it will deliver high-quality, safe products; there are risks and

perceptions associated with carrying surplus strawberries due to their perishability. Some of those risks were realized during the pilot—for example, some shipped product had inconsistent shelf stability and mold. While the distributor received credit for the rejected product, the credits didn't fully cover the costs associated with receiving, order pulling, shipping, and handling customer rejections. As such, the pilot had a negative financial impact on the distributor. Notably, there were communication challenges with the distributor on data availability and cold chain visibility, which limited responsiveness to product quality concerns.

Foodservice Operators

Thirty-three accounts tested the surplus berries, prioritizing fresh application. Chefs got creative, using them in a variety of beverages, whole-fruit snacking, and desserts. The product also appeared at various special events, including farmer's market-themed pop-ups and even a VIP client dinner. At least four new recipes were created by chefs on accounts that piloted the berries. These purchases were additive to operators' baseline strawberry purchases, reducing on-farm loss without cannibalizing the higher-margin No. 1 market for growers.[5]

> *"It was an initiative that, all of a sudden, everyone was talking about—it really clicked for folks."*
>
> — CORPORATE SUSTAINABILITY STAFF, U.S. FOOD WASTE PACT FOODSERVICE SIGNATORY

TABLE 1: USE CASES FOR NO. 2 STRAWBERRIES AT ACCOUNT SITES

Beverage Recipes

Recipe/Application
Strawberry agua fresca, boba, horchata, lemonade, matcha, milkshakes, and shrub
Strawberry syrup for lattes and other coffee beverages

Fresh Cut Recipes

Recipe/Application
Fresh-cut strawberries on yogurt, breakfast, or salad
Variety of composed salads, including candied walnut and strawberry salad
Strawberry oatmeal

Processed Recipes

Recipe/Application
Strawberry syrup or compote atop pancakes, waffles, and french toast
Strawberry balsamic vinaigrette
Strawberry green top salsa roja
Strawberry fruit leather

Dessert Recipes

Recipe/Application
Strawberry bread pudding
Strawberry shortcake
Strawberry hand pie

Successes

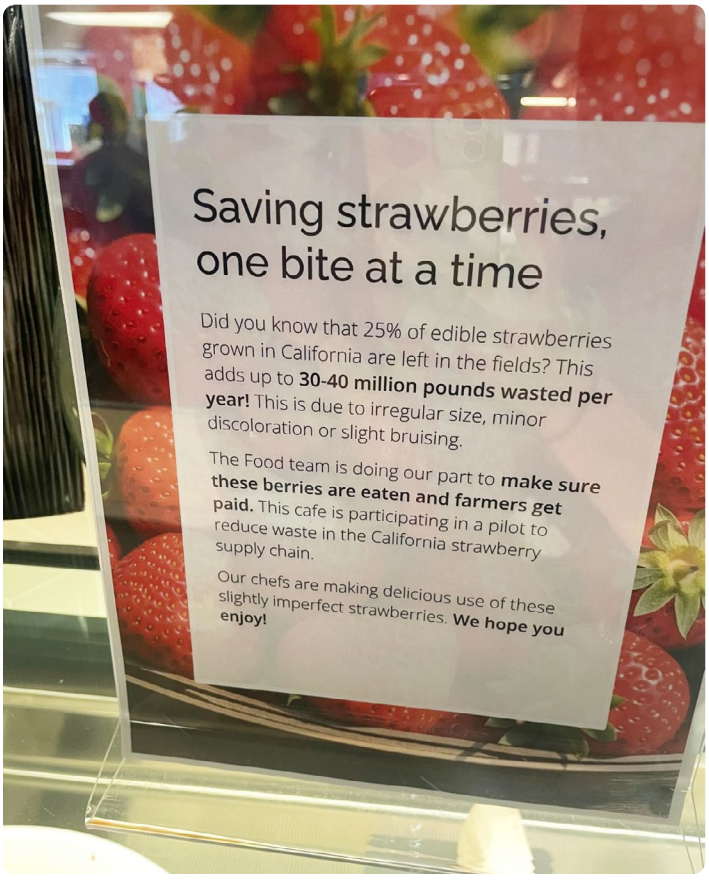
> *"The strawberries exceed expectations! We made them a highlight of a VIP dinner!"*
>
> — EXECUTIVE CHEF, SAN FRANCISCO, CA

Photographic and verbal feedback from chefs confirmed that samples sent to accounts were of high quality. Throughout the first three weeks of the pilot, operators were satisfied with the product. Back-of-house staff were briefed on the pilot's purpose in stand-ups—accounts reported that

frontline teammates were energized to participate and readily grasped how the product supported waste reduction further up the supply chain.

> *"The berries are small, but very tasty and ripe."*
>
> — EXECUTIVE CHEF, FOSTER CITY, CA

Accounts communicated the pilot to end-users through various methods, including table tents, physical and digital signage at serving stations and points of sale, and verbal communication with customers. Additionally, operators communicated about strawberry specials or pop-ups to end-users through one-off, weekly, or monthly building-wide emails.



Challenges

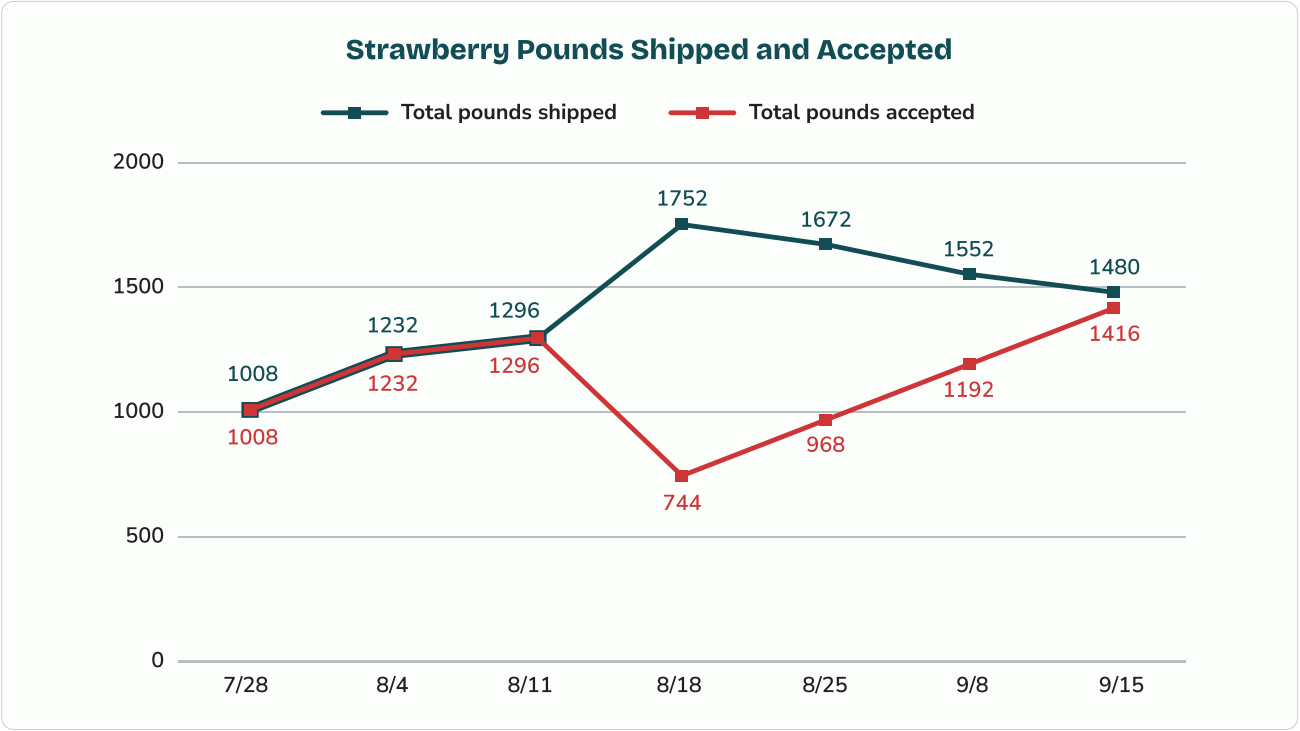
Operationally, the surplus berries proved inconsistent for high-volume foodservice, with molding issues eroding chefs' initial, high-quality ratings. Trim waste increased by a manageable 1–10%, but the more significant drawback was the incremental labor required to sort out unripe or spoiled fruit. Chefs emphasized that shelf life was notably shorter than No. 1 berries, requiring back-of-house teams to process and use the product quickly. As expected, the berries' appearance was not always "photo-ready." Despite these limitations, many accounts found the trade-offs worthwhile: the pilot delivered a 22.4% cost reduction compared to No. 1 strawberries, and the majority of participants agreed the savings justified the added labor.

TABLE 2: CHEF RATING OF STRAWBERRY QUALITY BY MONTH (SCALE OF 1–10)

Month-by-Month Quality Reflection	
How would you rate the quality of the strawberries on a scale of 1-10? (10 being perfect condition; 1 being worst/ unusable)	
July	7.3
August	6.8
September	5.0

Product quality issues—primarily molding—drove high rejection rates in the latter half of the pilot, which was a sharp contrast to the quality delivered in the first three weeks. Of the 9,992 pounds delivered to foodservice accounts over seven weeks, 21% was rejected due to molding. At peak, the weekly rejection rate averaged 58%, with one account rejecting over 90% of cases. High rejection rates disrupted culinary operations: accounts received shorted or substituted product, and in some cases, could not fulfill planned recipes.

CHART 1: POUNDS OF STRAWBERRIES SHIPPED AND ACCEPTED OVER PILOT PERIOD



To address the high perishability of the product and improve freshness and usability, the U.S. Food Waste Pact team, produce broker, and grower coordinated a mid-pilot pivot—reducing the number of hours from field to kitchen from 72 to 48 hours. These strategies helped but did not completely alleviate the perishability issues. The molding may be attributable to several factors, including, but not limited to:

1. **Timing and Product Robustness**
   The pilot ran at the end of the growing season (August and September), and the main strawberry varietal used was nearing the end of its harvest timeframe. An earlier pilot timeframe[6] would have ensured better product quality; however, the end of the harvest season is often when growers have the highest loss levels and need more buyer support via efforts like those in the pilot focused on surplus channels.

2. **Product Compression Damage**

   » **Overpacked Clamshells:** The grower's picking team unknowingly overfilled the clamshells, leading to product compression damage, compounded by the end-of-season fruit's lack of robustness. A field manager found 90% of sampled boxes were packed to 111%+ capacity—a clear optimization opportunity for future efforts.

   » **Clamshell Shape:** The two-pound clamshells purchased by the produce broker for the pilot were deeper than the clamshells the grower typically uses.[7] Unfortunately, in a well-intentioned attempt to reduce plastic, the clamshell size and shape facilitated compaction damage.

3. **Potential Cold Chain Interruptions**
   During weeks with elevated rejection rates and a concurrent heat event, limited data visibility made it difficult for the project team and produce broker to determine if external factors, such as cold chain interruptions in distribution, may have contributed to the quality issues.

Challenges and Opportunities

Grower

Challenges

The structure of season-to-season contracting does not incentivize harvesting surplus product.

The pilot hypothesis assumed that the grower's goal was to maximize fresh sales to realize a higher margin; however, the participating grower's frozen and juicing channels were not fully maximized.

The main strawberry varietal used was older and nearing the end of its harvest timeframe, which contributed to product quality issues.

Opportunities

Explore long-term concurrent harvest contracts, which can improve economic viability and planning for both labor and cooler space.

Increase flexibility in the standard way strawberry pickers work to enable concurrent harvesting practices.

Maximize both frozen and juicing markets while exploring secondary fresh channels.

Identify hearty, valuable, high-loss rate commodities that could be viable candidates for surplus grade.

Utilize financial and environmental learnings from this pilot to internally make the business case for fresh, imperfect, and surplus product.

Produce Broker

Challenges

The shape of the two-pound clamshells purchased was deeper than the clamshells the grower typically uses, unintentionally leading to product compaction damage.

Opportunities

Explore secondary channels outside of fresh, including frozen and juicing.

Distributor

Challenges

Product rejections during the pilot cost money.

The current cost model provides little incentive for distributors to provide imperfect or surplus product.

Opportunities

Explore alternative cost models that could incentivize surplus product.

Improve cold chain transparency.

Foodservice Operators

Challenges

Product inconsistency of surplus berries during the pilot limited widespread adoption for foodservice applications.

Opportunities

Advocate for measurement of and visibility into on-farm loss, including standardized supplier loss reporting and farm tours for foodservice professionals in sustainability, culinary, and procurement functions.

Advocate for imperfect and surplus brassicas and root vegetables, especially pre-cut options.[12]

Produce Broker and Distributor

Challenges

Communication challenges between the produce broker and distributor led to lags in troubleshooting product quality and loss drivers.

Opportunities

Support growers' identification of commodities that could be viable candidates for surplus product.

Planned Next Steps: 2026 and Beyond

Grower	Conducting an internal research pilot on a 20-acre parcel to understand the cost and return on a continuous cull program in tandem with a frozen market.
Producer Broker	Actively expanding surplus strawberry offerings with other distributors in the northeast region and with different end buyers. Exploring other commodities.
Distributor	Due to competing client sustainability priorities, no plans to scale; continuing to provide existing imperfect and surplus offerings to clients.
Foodservice Operators	Continue sourcing surplus product where price-competitive; request expanded imperfect product offerings from distributors. Supporting growers who implement a concurrent harvest model and highlight their stories. Improving clients' education about the environmental, financial, and social benefits of secondary-harvest practices. Conducting pilots for imperfect heartier crops (broccoli and peppers).
U.S. Food Waste Pact	Supporting Pact signatory efforts to advocate for the increased adoption of concurrent harvesting practices. Convening and facilitating a collaborative, cross-supply chain dialogue among growers, distributors, and end buyers for the expanded availability of secondary-harvest commodities. Leading the Supplier Engagement Task Force to develop standardized resources and best-practice frameworks to support supplier engagement, measurement, and the reduction of upstream food waste.

Conclusion

This pilot demonstrated that surplus strawberries can increase grower revenue while delivering cost savings for foodservice accounts and environmental benefits for all. Despite operational challenges, stakeholder engagement and momentum about the overall model remained strong. Growers, brokers, and foodservice operators all have opportunities to integrate pilot learnings into regular practice. Critically, supply-side leadership is essential: surplus products cannot materialize through demand alone, and innovation must be developed alongside/in collaboration with growers. Participants expressed enthusiasm for shaping the imperfect and surplus market by shifting focus toward heartier, less perishable commodities. Applying lessons from this pilot to new categories will help the industry refine this model and unlock its economic and environmental potential.

> *"We are talking about it as a successful pilot in terms of partnering and finding a different channel to bring more imperfect products in. We wouldn't move forward with this product in particular, but we're still very interested in the model."*
>
> — CORPORATE SUSTAINABILITY STAFF, U.S. FOOD WASTE PACT FOODSERVICE SIGNATORY

Endnotes

1. These signatories collectively represent approximately 61% of the U.S. contracted foodservice market share for the corporate dining segment (i.e., B&I).
2. Impact (either GHG or water) intensity is a measure of an operation's environmental footprint relative to the production output. In the case of both emissions and water, the farm's impact remains the same but can now be divided by a higher strawberry output due to the intervention. **https://assets.worldwildlife.org/www-prd/documents/GFLT_Guidance_Manual_2.0_4_29.pdf** pages 17 and 18
3. **https://psab.us/psab/index.ph**
4. Due to the project's short-term nature, these support components were not included in the pilot.
5. No. 1 strawberry volumes increased from 2024 to 2025 across all operators, even with the introduction of surplus strawberries.
6. A number of factors influenced the late start date, including the process to secure sufficient volume from foodservice accounts to ensure the grower would participate, long lead time to add the product into the distributor's system, and coordinating the logistics of getting samples to 33 accounts; these delayed the anticipated project start from April to end of July 2025.
7. The difference in clamshells was missed and not communicated to the core project team until mid-pilot, at which point significant volumes of the incorrect clamshells had already been procured.
8. **https:/www.ams.usda.gov/grades-standards/strawberries-grades-and-standards**
9. For a chart with details on strawberry grades and price points, please see the case study's Technical Appendix.
10. There are three different grades of frozen (A, B, and C) depending upon cosmetic standards like color, size, and percentage of lot with visual defect. **https://www.ams.usda.gov/grades-standards/frozen-strawberries-grades-and-standards**
11. This is not a formal USDA retail grade but rather a classification used by the processing industry. Juicing strawberries are culls left over after No. 1 and No. 2 grade berries have been picked.
12. In contrast to strawberries, these commodities are heartier, less fragile, and slower to spoil. They are also traditionally prepped and cooked, not served raw. Pre-cut options could reduce incremental labor for sorting.

Acknowledgments

The U.S. Food Waste Pact team would like to thank Compass Group, Guckenheimer, and Sodexo for their invaluable participation, innovative spirit, and flexibility in this project. By participating in this pilot, teams contributed to industry-leading research on food waste solutions development. These operators demonstrated leadership through supporting growers in testing innovative on-farm waste reduction solutions while also reducing their carbon and water footprint. Additionally, we would like to thank the participating supply chain partners, including the grower, distributor, and produce broker.

About Compass Group

Compass Group is redefining the food and facility services industry through innovation, operational excellence, and a focus on what's next. Serving healthcare systems, educational institutions, cultural centers, sports and entertainment venues, and Fortune 500 companies, Compass Group delivers tailored solutions at scale. The company is consistently recognized among the world's most admired companies and leaders in sustainability and innovation. Learn more at **compass-usa.com**.

About Guckenheimer

Guckenheimer is a chef-led workplace dining partner that delivers food solutions for businesses across North America. They blend culinary craft with innovation and hospitality to create experiences that taste delicious, fuel productivity and inspire connection. As leaders in sustainability—they were the first major U.S. food service business to cut food waste in half and have been ranked #1 in protein sustainability by the Humane World for Animals for five years running—Guckenheimer chefs choose ingredients and methods that cut carbon and design plant-powered menus that are as good for the planet as they are for people.

About Sodexo

Sodexo North America is a division of Sodexo Group, a global leader in food and services shaping better everyday experiences at every moment in life: work, heal, learn and play. Operating in all 50 U.S. states, Canada, Puerto Rico and Guam, Sodexo North America is committed to meeting the challenges of everyday life with a dual goal: to improve the quality of life of our employees and those we serve, and to contribute to the economic, social and environmental progress in the communities where we operate. Founded in Marseille in 1966 by Pierre Bellon, Sodexo Group stands out for its independence, its founding family shareholding and its responsible business model. Sodexo is included in the CAC Next 20, CAC SBT 1.5, FTSE 4 Good and DJSI indices.

About the U.S. Food Waste Pact

The U.S. Food Waste Pact is a national voluntary agreement that uses the "Target, Measure, Act" framework to reduce food waste across the supply chain. The Pact works with waste-generating food businesses to collect and analyze data about food waste in their operations, share best practices through collaborative working groups, and pilot and scale solutions through intervention projects. The Pact is an initiative between nonprofits ReFED and World Wildlife Fund. For more information about the U.S. Food Waste Pact, visit **usfoodwastepact.org**.

Partner Leads

U.S. Food Waste Pact Business Signatories

For a complete list of all current U.S. Food Waste Pact signatories, visit usfoodwastepact.org.