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PREMIUM
REPORT

Logistics from Field to Plate

Premium Report Featuring 10 Exemplary Startups

Foodbytes
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Logistics from Field to Plate

Foodbytes aims to make connections within the F&A (food and agriculture) industry to drive meaningful improvement in the food value chain. To inspire and cultivate valuable collaborations, we are exploring various areas we believe are positioned to drive sustainable impact.

In this report, our team examined how companies are optimizing logistics from field to plate through loss prevention, decentralized distribution and system automation. We scouted and reviewed more than 250 aligned startups, directing our focus on key trends driving growth. Afterwards, we convened a targeted group of global Rabobank thought leaders across logistics, packaging, consumer foods and investment who lent their expertise in selecting our 10 spotlight startups.



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Featured Rabobank Experts



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Packaging Analyst NA



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Maria Castroviejo
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Consumer Foods
Analyst Europe



Bourcard Nesin
RaboResearch
Beverage Analyst NA



Albena Todorova
Rabo Ventures
Venture Partner

4 Themes Driving Logistics Innovation from Field to Plate

1 Simple Integrations & Reduced Complexity

Intelligent automation – including the use of Generative AI – promises hope for accelerated revenue growth and profitability across myriad sectors over the next year. However, within the F&A industry, the tech transformations that will be most effective in the near term are likely incremental improvements, “starting with sensors for temperature, humidity, energy consumption and more,” noted RaboResearch Packaging Analyst Xinnan Li during a Foodbytes logistics roundtable in November 2023. Once corporates ensure that their foundations for automation are in place through sensor integration and increased supply chain transparency, they can build out more robust automation strategies.

2 Reducing Waste & Improving Quality

In the current inflationary environment, F&A corporates are looking to employ new methods of ingredient sourcing and food processing to tackle the challenges of food waste, energy costs and labor variability. Common goals include improving the shelf life and nutritional profiles of products without additional processing steps – and ideally even displacing current ones. To achieve these goals, **coordination and transparency between producers, manufacturers, retailers and consumers is essential to track and utilize the full value of food** throughout the chain.

3 Evolving with the Consumer

Consumer desire for less processed food and gravitation towards e-commerce, coupled with the rise of global sourcing, is challenging current food logistics infrastructures. “Demand volatility is larger than historic patterns, which has an impact on food availability, stockage and logistics,” shared RaboResearch Consumer Foods Analyst Maria Castroviejo. Logistics innovations, including **agricultural and consumer marketplaces and indoor agriculture, provide alternative distribution models that meet consumer demand for both convenience and sustainability.**

4 Providing Full Chain Traceability

“We have seen a regularity tsunami in logistics over the last couple years related to sustainability – specifically regulation on energy efficiency,” noted RaboResearch Logistics Analyst Viet Nguyen. The EU has adopted aggressive targets, like reaching nearly 50% emissions reduction by 2030 from 1990 levels. But to even begin to measure improvements in both emissions and energy savings, companies first need a clear picture of their current Scope 1, 2 and 3 emissions. By helping their networks of suppliers adopt traceability technologies, **corporates can engender data standardization, collaboration towards emission reductions, and ultimately improved ROI for all players.**

Reimagining Logistics in F&A

While [news coverage of supply chains](#) peaked in the aftermath of the COVID-19 pandemic, consumer price inflation has kept logistics top of mind for food companies looking to keep costs down. In the United States, overall food costs have [risen just over 3%](#) year-over-year as of October 2023. However, vending machine and mobile vendor foods saw a nearly 15% increase, and frozen vegetables an 11% increase, highlighting the inefficiencies of food distribution systems, particularly cold chain management.

Logistics innovation can play a major role in achieving improved economics, as well as curbing emissions for one of the highest emitting and fragmented industries in the world. Improved downstream systems can meet shoppers where they are, providing convenience while enabling consumer traceability and demand forecasting all the way back to the producer. The emergence of alternative tech-driven consumer and wholesale marketplaces, like Misfits Market and Thrive Market, have the potential to disrupt traditional food distribution. Additionally, blockchain traceability and verification of products across supply chains have become increasingly important to measuring progress towards sustainability goals, as well as tracking contamination and foodborne illness.



10 Standout Startups Pioneering Logistics from Field to Plate

How are startups addressing the themes we’ve discussed in unique ways? What type of traction are they seeing? How can you learn more and collaborate with them? We’re glad you asked!

Click on their names in the next pages to view their Foodbytes profiles in the hub. Once you’re there, you can:

View pitch decks,
current needs and more

Add startups to
your watchlists

Reach out directly
to startups

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Loss Prevention

Interest in food waste and safety technologies continued to rise throughout 2023, **ranking at the top of corporate watchlists in the Foodbytes hub.** Within the logistics space, startups are pioneering processing solutions that manipulate temperature, humidity and other atmospheric controls to **extend shelf life and ensure less wasted food throughout the chain and higher food quality** at the end. These measures can enable food companies to shift away from ultra-processed foods to “cleaner” labels without sacrificing ingredient stability or product longevity.



By preventing losses, companies can ensure that the energy they are expending on logistics results in a viable final product at point of sale – especially important as logistics comprises such a big part of Scope 3 emissions. **“For food processors, Scope 3 is 95% of their emissions, and distribution and transportation accounts for 20% of that,”** noted Xinnan Li.

To address the cultivation or processing areas where waste is unavoidable, innovators are developing techniques to **upcycle by-products into valuable ingredients.** Foodbytes startup [Capro-X](#) utilizes food waste, including acid whey, to provide a sustainable alternative to palm oil-derived chemicals. This solution is a prime example of how upcycled ingredients can be used to replace more carbon-intensive and ultra-processed additives while delivering the same or improved properties.

“Looking forward in the next five to ten years, the middle of the supply chain is going to contribute to an outsized share of necessary emissions reductions.”

– Xinnan Li, RaboResearch Packaging Analyst NA

Loss Prevention

Click on the Foodbytes Spotlight  startups below to visit their profiles,  [ADD TO WATCHLIST](#) and [GET IN TOUCH](#)



Acoustic Extra Freezing:

Solving for the challenges of traditional freezing through novel technology that retains nutritional value and protein/lipid structures. The equipment generates acoustic waves that control the growth of ice crystals in freezing cabinets, freezing containers, retrofit of shock freezing chambers and more.



It's Fresh:

Intelligent ethylene control technology that is embedded with a range of packaging formats from the point of harvest, whilst in storage, during transit, or in the retail environment.



BioVeritas:

Bio-based ingredients company pioneering a proprietary upcycling process that creates high-quality, high-performance, clean label ingredients. This process delivers on consumer needs while displacing carbon-intensive petrochemical processing.

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Decentralizing Distribution

Connected marketplaces and novel processing platforms allow for the **local production and distribution of foods** that would otherwise require long-distance transportation and result in a heavy carbon footprint.

RaboResearch Beverage Analyst Bourcard Nesin shared that from the perspective of large bottling organizations, having plants distributed ideally across geographies is valuable in terms of reducing cost. **“They can ship more closely to their markets and can respond more effectively to local consumer needs, while reducing geopolitical risks,”** as international resources may need to be delayed, re-routed or completely replaced due to global conflict or policy changes. This decentralization also unlocks the ability to use features like returnable packaging because the bottlers don’t have to ship them as far. For many industries currently importing products in their final packaging from abroad, Nesin believes **“there’s a lot of opportunity to bottle, package, finish or even just produce products from scratch that are branded in association with a foreign country within the end market.”**

From a consumer perspective, **a balance of decentralization and connectivity might support an increase in demand for local foods.** Drawing upon her experience withing the European market, RaboResearch Consumer Foods Analyst Maria Castroviejo noted that local products are highly valued and in some European countries, even a required part of the food system. For example, regulation for contract catering with the public sector requires a certain percentage of the food to be certified local, necessitating extra traceability measures and indirectly prompting logistics innovation in that supply chain.

Consumers also desire decentralization in food. “There has been a change in the retail landscape; **Millennials and Gen Z don’t want to walk down the store aisles and are craving more experiential/hybrid retail environments,**” shared RaboResearch Packaging Analyst Xinnan Li. This blurring of lines between retailers and foodservice was highlighted by the November 2023 merger of Chicago-based specialty grocers Foxtrot and Dom’s Kitchen and Market. Through smaller-store formats and highly curated groceries and prepared meals, the new company aims to bring together “the convenience of a market with the experience of a restaurant.”



Decentralizing Distribution



Wicker Park Logistics:

Digitally-enabled third-party logistics partner offering cutting-edge technology to hedge risk in times of freight market volatility, flex to market demands and provide the tools and visibility needed to build a resilient transportation procurement strategy.



Waku:

Food marketplace focused on B2B solutions, with 60+ kitchen partners in 20 cities and over 15K menu selections. Waku serves daily meals, snacks and frozen food, empowering and digitizing local kitchens and catering businesses.



SBT:

Solving for beer supply chain challenges by removing water and alcohol and shipping the condensed beer through the supply chain without kegs. SBT then reconstitutes the beer at time of dispense, reducing the footprint of shipping water and delivering mass customization at point of purchase.

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System Automation

Many of the same drivers for automation that we mentioned in our grower-centric 2023 Robotics & Automation [report](#) remain present in the logistics space. According to Bourcard Nesin, **“the primary concern of US operators when it comes to technology adoption and the value chain is labor and cost savings.”**


While European operators are more concerned with regulation than their US counterparts, Rabo Ventures Partner Albena Todorova agrees that the aging labor force is a huge threat to the F&A industry at large. From the perspective of Rabo Ventures, Rabobank’s internal VC fund, the F&A logistics space is still nascent, but they believe that there will be significant technology transfer from other industries in which logistics have been vastly improved.

Foundational technology improvements include the **use of sensors, from sheer volume of sensors to connectivity reliability**. For AI to work properly, real-time data tracking needs to be enabled in more places to connect the dots throughout the food supply chain. The diverse nature of the industry makes this particularly hard to implement. **“If we speak about data in the F&A supply chain, it would mean one thing for packaged goods and completely different things for meat processing or for fresh produce,”** commented Albena Todorova. Yet in many cases, those supply chains are feeding into the same end products. Rather than aiming for blanket automation, **startups that offer “smart” automation for specific use cases, such as labor augmentation or sensor integration, are going to reduce complexity and be most effective** in the short term, while providing incremental long-term impact.

“We will see more and more startups managing processes with the help of artificial intelligence and machine learning. However, the foundations in F&A are just not there yet. We first need to get the right information into the right hands.”

– Albena Todorova, Rabo Ventures Venture Partner

System Automation

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CLCIRCULAR:

IoT devices that monitor cargo during transport and storage, making real-time monitoring technology accessible to every kind of commodity transported in containers. The solution reduces food losses by enabling immediate reactions to problems and automatically gathering data to digitize supply chains.



AgrigateOne:

Supplier management platform that streamlines the operational process of importing fresh produce from a global supply base while using smart analytics to build predictive and prescriptive models via machine learning.



TraceX Technologies:

Platform using blockchain technology to create a connected network of value chain players that builds trust, integrating 'Ground Truths' with remote infrastructure like satellite imagery, drones, IoTs, weather stations and more to validate and help make data driven decisions.



Yolda:

B2B freight forwarder that uses automated dispatching for efficient and sustainable agriculture and food transport. Yolda connects business partners and logistics companies to offer data visibility, intelligent dispatching, dynamic pricing and smart utilization of empty truck capacities.

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Food for Thought

Rabobank colleagues and innovation leaders at F&A corporates shared emerging innovation opportunities within logistics. Here are some of their takeaways:

1

Driver hiring and retention: one-third of drivers in Europe are over 55 years old.

2

For cold storage, the aim is implementing technology that has already been around for decades – like sensors that automatically close the warehouse door.

3

Automation in retrieval and stacking within warehouses that works in tandem with free-flowing labor.

4

Atmospheric control to mitigate a top risk of fully automated warehouses: fires.

5

Electrifying and automating fleets of trucks as a top sustainability priority for distributors.

6

Reducing water use for cooling down data centers.

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