



# CPG INNOVATION IN 2025

Unlocking the Tipping Point in Sustainability,  
Health, and Packaging



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**Regulatory landscape  
around sustainability**



**Explosive AI growth**



**Supply chain  
disruptions**



# How can you leverage tipping points for competitive advantage?

# FOCUS ON 3 MAIN PILLARS

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- CONSUMER HEALTH
- SUSTAINABLE INGREDIENTS
- PACKAGING INNOVATION



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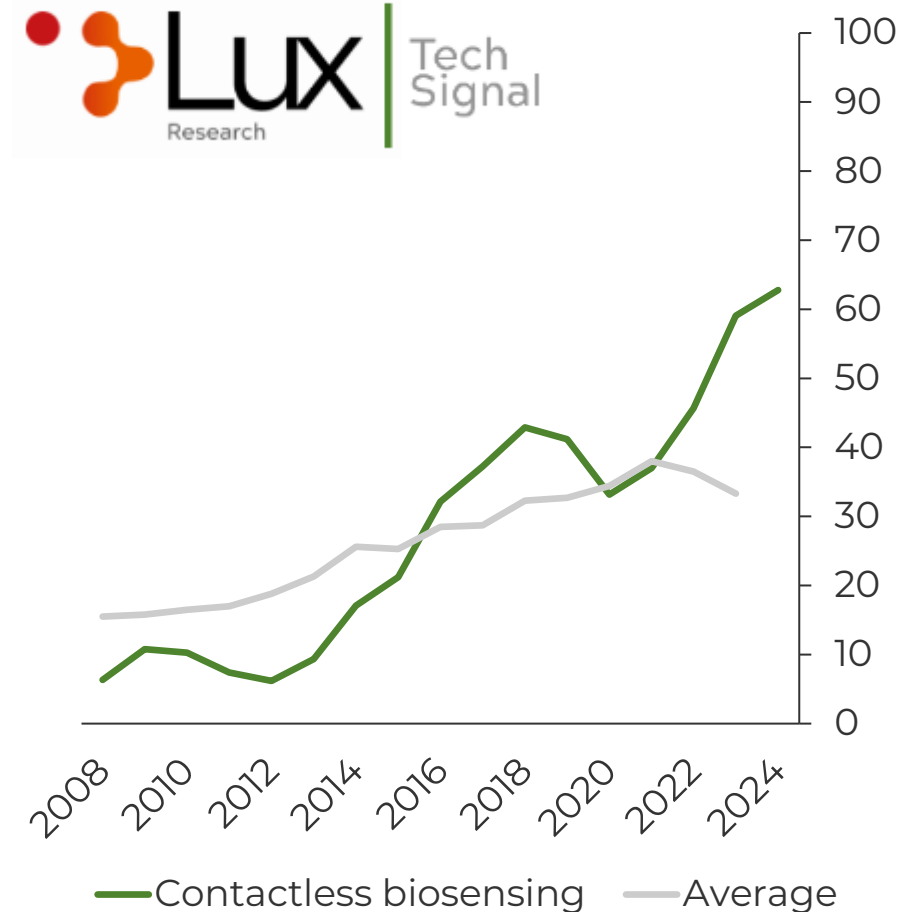
# CONSUMER HEALTH

# CONTACTLESS BIOSENSING

Biosensing without making bodily contact

The next generation of consumer health monitoring

- Consumer wearables are starting to gain mass adoption but must overcome two key issues:
  - **Retention rates**
  - **Not suitable for all groups**
- Contactless biosensing can address these.
- The technology is nascent but has maintained strong momentum.



# CONTACTLESS BIOSENSING

The landscape can be divided into three main types of technologies:

1. Facial biometrics
2. Voice-based biomarkers
3. Passive monitoring

## CONTACTLESS BIOSENSING



### 1 FACIAL BIOMETRICS

### 2 VOICE-BASED BIOMARKERS

### 3 PASSIVE MONITORING

				
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# TIMELINE OF KEY EVENTS

Binah.ai and CareOS partner to embed its facial biometric technology into smart mirrors for home use

**March 2022**

**September 2022**

Neteera Technologies secures U.S. FDA clearance for its contactless cardio-pulmonary passive monitoring platform

Cambridge Cognition acquires Winterlight Labs, a voice-based biomarker startup, focused on early dementia detection

**January 2023**

Mayo Clinic and Klick Health publish a study supporting a 10-second voice-based biomarker analysis to screen for diabetes

**October 2023**

Midi Health partners with Neurotrack to identify brain fog in menopausal women using eye-tracking technology

**March 2024**



# CASE STUDY

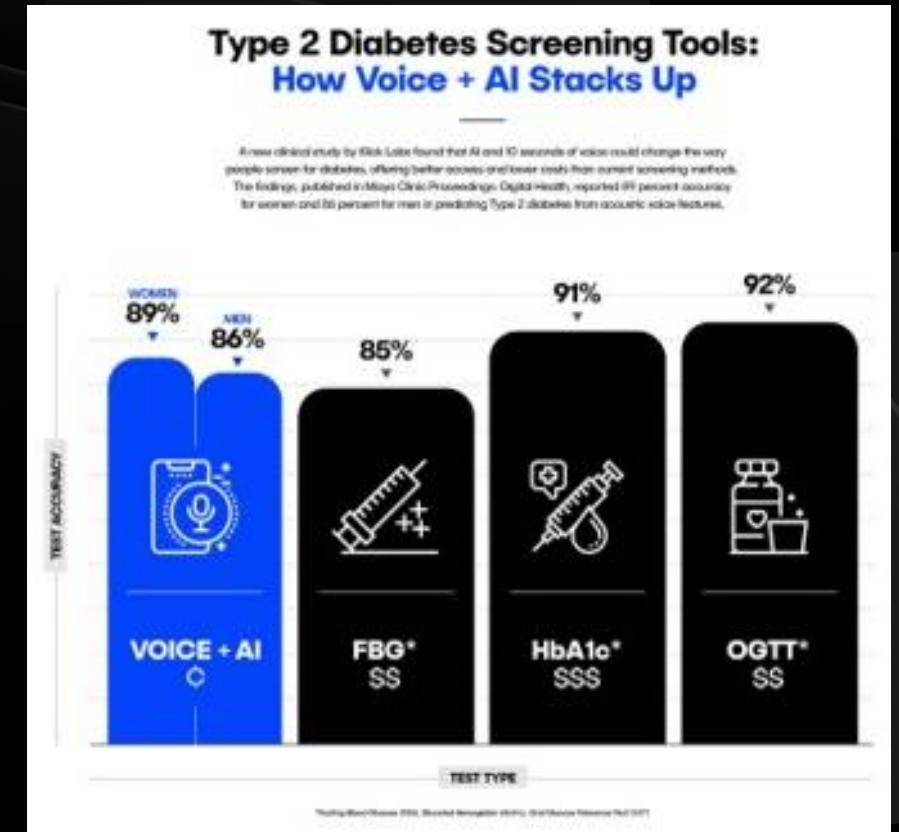
## Mayo Clinic and Klick Health developed a voice-based biomarker for diabetes detection

A 10-second voice recording predicted Type 2 diabetes with over 85% accuracy

- Researchers analyzed 14 acoustic features from over 18,000 voice recordings to identify significant vocal variations between diabetic and nondiabetic patients
- Vocal changes manifested differently in men and women

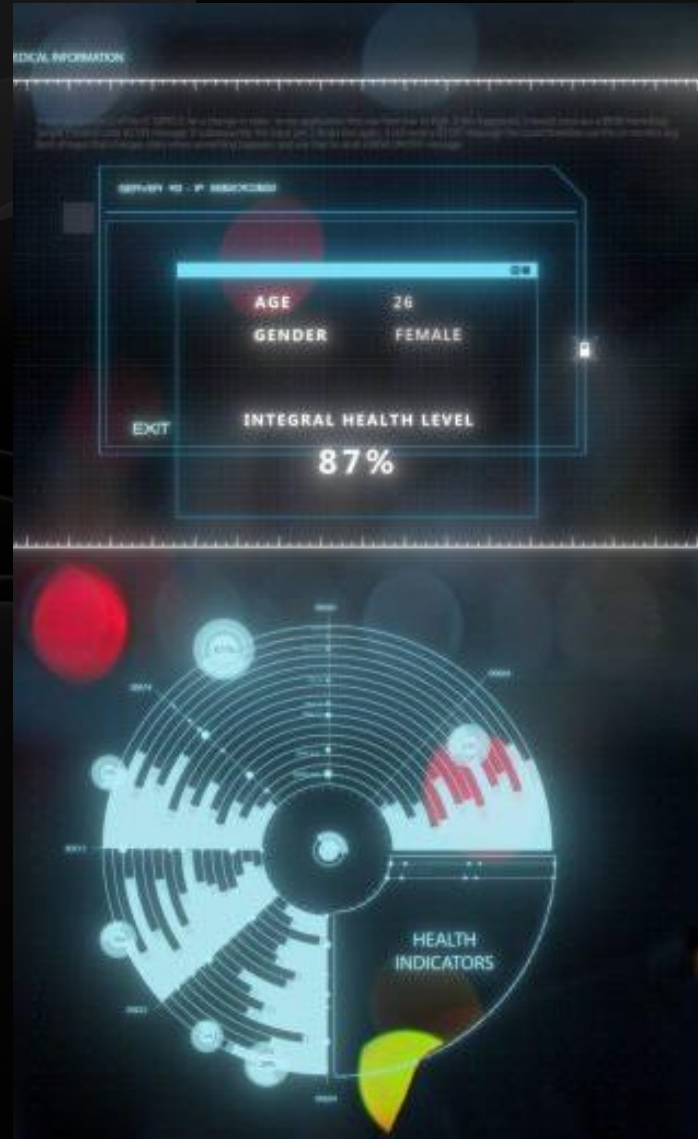
### LUX TAKE

While the findings are promising, more research and validation would be needed before this could be implemented as a widespread screening tool for diabetes.



# OUTLOOK

- Despite the promise of contactless biosensing, the current landscape of available players is sparse, but companies are beginning to penetrate the market.
- Data privacy concerns may also slow penetration.
- Keep an eye on these early use-cases and look for opportunities through larger ecosystem partnerships.



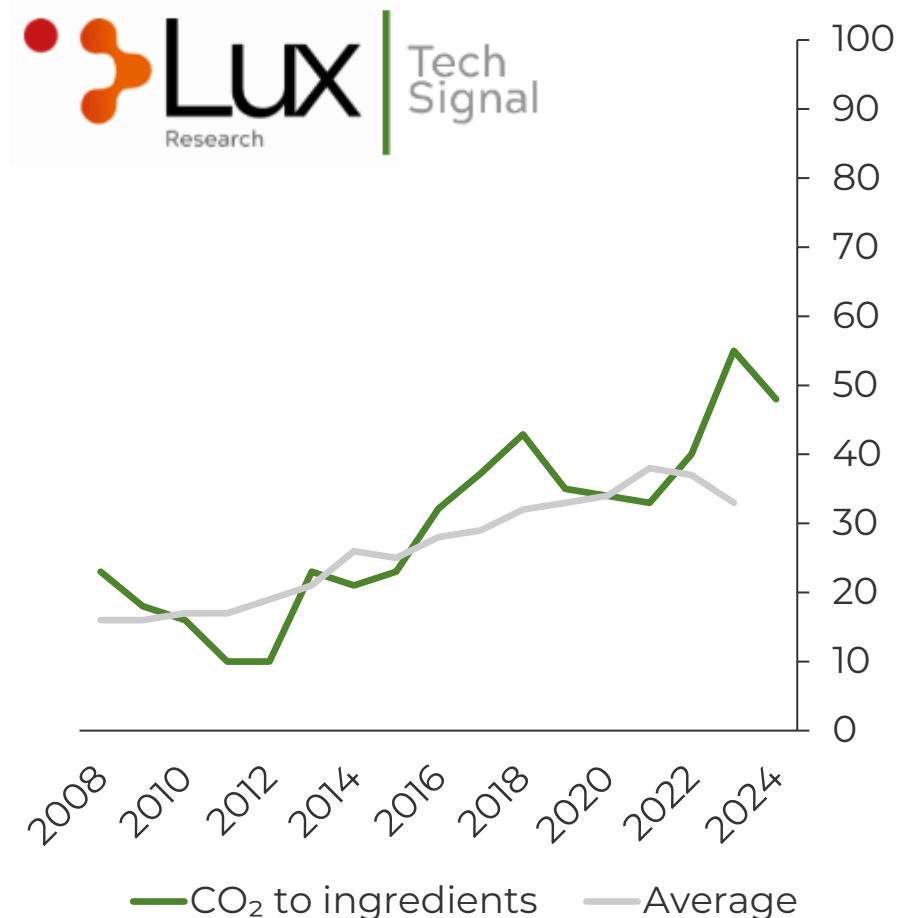
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# SUSTAINABLE INGREDIENTS

# CO<sub>2</sub> TO INGREDIENTS

Involves microbial or electrochemical methods for CO<sub>2</sub> to protein and lipid production.

- The intersection of decarbonization and sustainable food production is driving momentum for alternative routes like CO<sub>2</sub> utilization for food.
- Microbial methods are more common, typically using hydrogen-oxidizing bacteria with H<sub>2</sub> as an energy source and CO<sub>2</sub> as a carbon source to generate biomass with a high protein content (50%–83%).



# CO<sub>2</sub> TO INGREDIENTS

The landscape can be divided into two main types based on the target ingredient:

1. Proteins
2. Lipids

## CO<sub>2</sub> TO INGREDIENTS TECHNOLOGY LANDSCAPE

### 1 PROTEINS

From top to bottom: corporates, startups

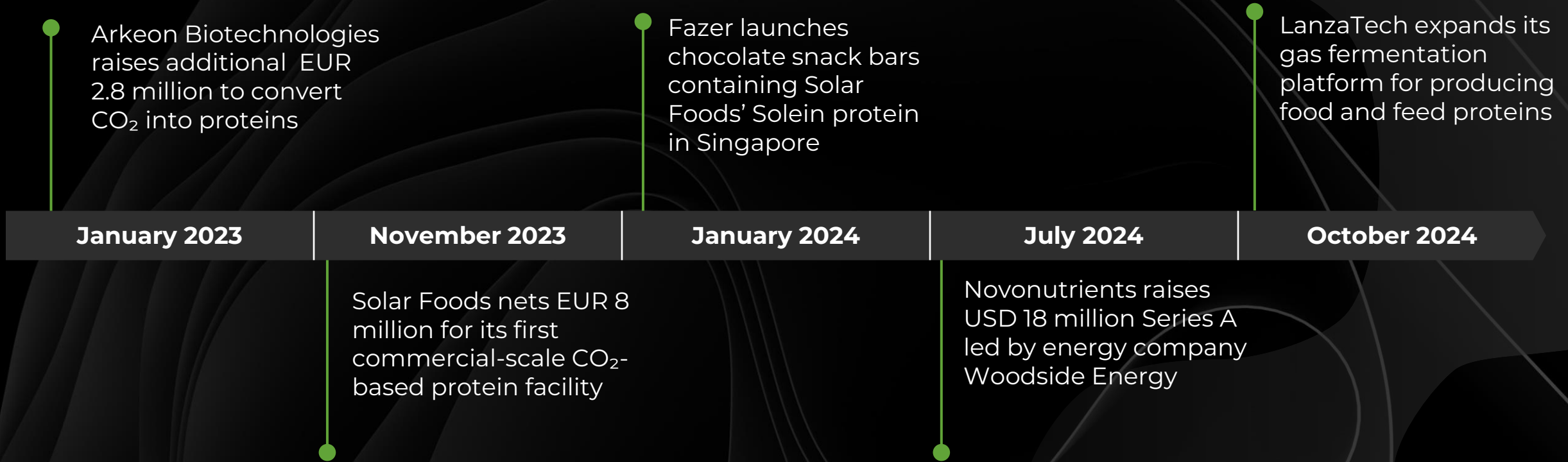
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### 2 LIPIDS

From top to bottom: corporates, startups

# TIMELINE OF KEY EVENTS



# CASE STUDY

## Solar Foods partners with Ajinomoto to launch CO<sub>2</sub>-to-protein products

APAC remains Solar Foods' launching ground of Solein protein following regulatory approval in Singapore.

- Solar Foods will expand and launch flowering mooncakes and ice cream sandwiches under Ajinomoto's new Atr.72 brand.
- Solein will be used in low percentages as a dairy protein.

### LUX TAKE

While Solar Foods is seeking a first-mover advantage in a novel source that fits the growing protein demand, it should still scale up production beyond the current capacity of 160 tonne to prove its ingredients' cost-effectiveness.



# OUTLOOK

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- Alternative ingredient production toolbox will continue to evolve in line with changing policies and regulations.
- Look ahead and develop a roadmap for alternative production methods for key ingredients like fats and proteins.
- CPG companies need to embrace diversified approaches to stay ahead of the game.





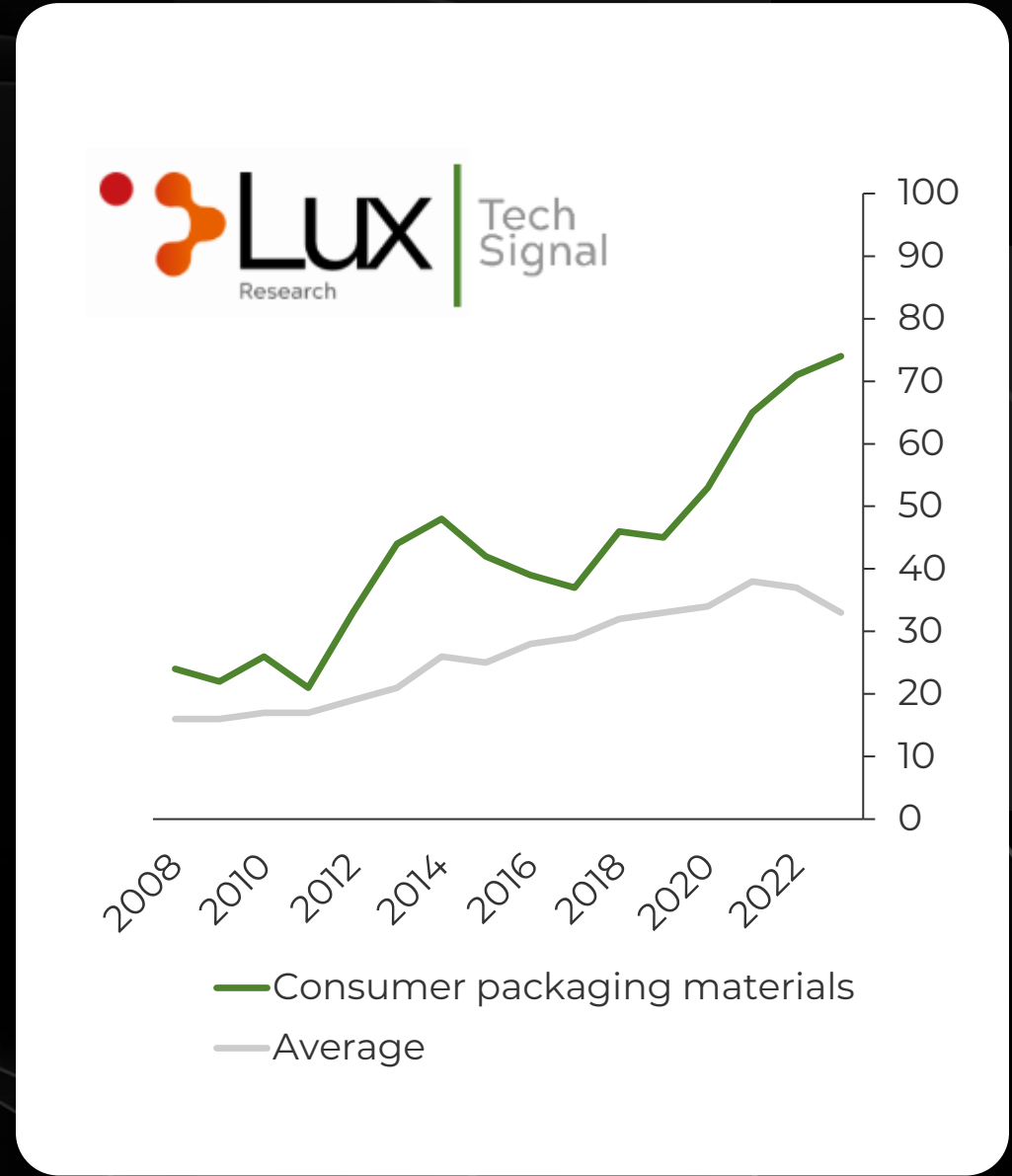
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# PACKAGING INNOVATIONS

# PACKAGING INNOVATIONS

To improve packaging performance and offer alternatives to regulated materials

- The industry's most pressing needs revolve around designing packaging with end of life in mind, reducing carbon emissions, and incorporating renewable or recycled content to use less virgin plastic.
- Companies must understand where innovations can meet performance requirements and regulation mandates and offer sustainability gains.



# PACKAGING INNOVATIONS

The landscape can be divided into four main types of technologies depending on material composition and function:

1. Pulp and paper packaging
2. Monomaterial packaging
3. Compostable packaging
4. Barrier solutions

## LUX Research | TECH HUB - CONSUMER PACKAGING MATERIALS

### 1 PULP AND PAPER PACKAGING


### 2 MONOMATERIAL PACKAGING


### 3 COMPOSTABLE PACKAGING


### 4 BARRIER SOLUTIONS


# TIMELINE OF KEY EVENTS

Xampla announces the commercialization of its soluble, compostable, and edible protein-based materials, under the Morro brand

**September 2023**

Paboco starts operating its industrial-scale plant in Denmark, aiming to produce over 20 million paper bottles by the end of 2025

**February 2024**

With investment from Suzano Ventures and Collateral Good, Nfinite Nanotech will scale up operations of its nanocoating technology

**June 2024**

Upon completion of Avantium's biobased polyethylene furanoate (PEF) plant, Dutch supermarket chain Albert Heijn will use PEF in its own-brand packaging, starting with juice bottles

**November 2023**

Mondi will collaborate with Traceless Materials to use the company's pellets, derived from agricultural waste, to develop coating formulations for paper packaging

**June 2024**

# CASE STUDY

## Zotefoams: Recyclable monomaterial beverage packaging

Zotefoams has developed a recyclable HDPE cellular technology for beverage packaging.

- It produces white HDPE polymer sheets with foam layers inside, created by saturating the polymer with nitrogen.
- 1-L ReZorce carton uses 53% less energy and 51% less water and has a 55% lower global warming potential than traditional beverage cartons.

### LUX TAKE

Creating nanovoids inside the polymer matrix, via additives or nonreacting gases, reduces polymer density while improving stiffness. This is an opportunity to reduce material costs and carbon footprint of the final packaging.



ZOTEFOAMS



# OUTLOOK

- Sustainability alone is no longer a differentiator; packaging must also meet performance standards.
- Simple changes, such as thinning out packaging walls, are often more effective than piloting 100% bio-PE packaging, which draws media attention but offers less immediate impact.
- Recycled plastic is the safest bet for sustainable packaging, as there is a strong global consensus supporting its use.



# KEY TAKEAWAYS

1

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**There are opportunities on the horizon for contactless biosensing.**

While still emerging, contactless biosensing is showing early promise in the market. In 2025, pilot programs for specific use-cases are worth exploring to demonstrate feasibility and prove the value of contactless biosensing solutions.

2

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**Diverse ingredient strategies are essential to drive both short-term and long-term growth.**

Driven by consumer demand and resource scarcity, companies need to embrace alternative production routes. Investment in R&D and strategic partnerships to close technology gaps will be essential.

3

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**Industry must show strategic readiness to meet packaging circularity goals.**

Companies' efforts to meet circularity goals will be subject to intense public and media scrutiny. As a result, expect brands to be much more strategic in their circularity goals and progressively shift deadlines to 2030–2035.



# THANK YOU

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