

Demand Landscape- Accelerating Food Ingredient Innovation through AI and Scientific Expertise

Hourglass Research's latest "Executive Pagets" unveils a major trends in globally:

- 780+ AgriFoodTech companies now leverage AI/ML globally
- AI cuts product R&D time by up to 40-50% in select use cases
- 42% of consumers positively view AI in food production (*FoodNavigator, Jan 2025 survey coverage*)

These signals show how AI is moving from a support tool to a strategic lever for faster, smarter, and more sustainable food innovation.

Dive into the data and discover white-space opportunities shaping the future of AI in food ingredients demand. Let's connect to discuss how your brand can capture this demand!

hourglass



Why AI is becoming relevant now

The Pressure Points and Growth Catalysts Behind AI-led Ingredient Design

Critical Bottlenecks

Multi-year cycles

Developing new functional ingredients
High failure rates, costly iterations

~30%

Food waste in supply chain
Sustainability pressure mounting

20%

US & UK consumers
Demand for personalization
(McKinsey Survey, 2024)

2028

FDA FSMA 204 deadline
Traceability requirements

What's Powering Progress



Predictive Formulation

ML models simulate ingredient interactions before physical trials — dramatically cutting bench time. AI agents like Luna AI autonomously run R&D workflows.



Commercialized AI-Powered Ingredient Discovery Platforms

Platforms like Shiru's Flourish identify novel functional proteins. NotCo's Concept Quant launched in 2025 for food developers globally.



Demand for Hyper-Personalized Nutrition (AI + Omics)

AI analyzes genetic, metabolomic & microbiome data to recommend precision ingredients. 48% of consumers are open to genetic-based AI nutrition.



Sustainable Sourcing Intelligence

AI maps ingredient supply chains for climate risk, enabling proactive substitution with eco-friendly alternatives before crises hit.



\$50 - \$85 B

AI in F&B market by 2030



300%¹

Yield increase via AI-CRISPR for alt-proteins



60%¹

Reduction in bioreactor failures

How AI is being applied today

AI in Action: Solution Pathways Transforming Food Innovation



Precision Fermentation & Protein Design



RL algorithms optimize *Bacillus subtilis* fermentations for plant-based dairy, achieving 98% purity with 30% less energy



Flavor Development & Formulation



AI screened 5,000+ leghemoglobin variants, shortened R&D by 18 months for plant-based heme development



Hyper-Personalized Nutrition



ML + Continuous Glucose Monitors + microbiome data for real-time dietary recommendations. Predicts individual responses to foods and adjusts suggestions



Sustainable Operations



Patent-pending AI + computer vision for red meat yield optimization, reducing waste and improving production efficiency

Where the opportunity exists

Consumer Pull, Market Gaps, and Future Bets

What Consumers Want From AI-designed Food Products



Health benefits — ranked #1 AI priority by consumers

75-80%



Better taste / improved flavor matching

60-65%



Sustainable / eco-friendly ingredients

40-50%

Whitespaces/ Unmet Needs

- **Lack of multimodal datasets** linking composition, perception, and processing
- AI models trained on **diverse, non-Western ingredient databases**, incorporating cultural acceptability signals, religious dietary laws
- **Real-time, AI-powered rheology and texture prediction tools** that connect ingredient ratios to consumer-perceived mouthfeel outcomes
- A **regulatory-aware reformulation AI** that cross-references ingredient substitution options against current global regulatory databases



Future Watch

Quantum Computing

Next-gen

Emerging

Molecular pathway optimization for complex protein design.

Neuro-AI

Next-gen

Emerging

Uses behavioral and sensory signals to predict cravings, liking, and purchase triggers

Sources: McKinsey Survey (2024); BCG Survey (2024); BCG Survey (2026), Hourglass Analysis, other secondary sources

What are key AI challenges

Why Adoption Remains Measured: Key AI Challenges

AI can accelerate product innovation, but many F&B teams struggle to move from scattered pilots to validated, business-ready use cases

 AI Pain Points for F&B Teams	 Hourglass Value
 Fragmented vendor and startup landscape <i>The AI ecosystem is crowded, with overlapping claims across formulation, sensory prediction, consumer insights and digital twins</i>	Convert vendor noise into fit-for-purpose partner choices • Separate real capability from AI-led claims and marketing hype • Validate partners that can move beyond demos into pilots
 Unclear proof of real business value <i>Many AI pilots sound promising but lack clear linkage to faster development, better products or reduced cost</i>	Translate AI potential into measurable R&D and business outcomes • Pressure-test claims against patents, case evidence, competitor activity and expert judgement • Build use-case-level value hypotheses with success metrics and decision parameters
 Too many scattered AI use cases <i>AI is being discussed across flavor, nutrition, personalization, claims and process optimization, but teams often lack clarity on where to start</i>	Create a focused AI opportunity roadmap • Prioritize opportunities using both data-led scoring and human expert review of feasibility, risk and adoption readiness • Separate quick-win pilots from strategic AI capability bets
 Data readiness and integration challenges <i>AI tools need structured sensory, formulation, consumer and process data, which may sit across disconnected systems</i>	Make AI usable within the client's real R&D workflow • Work with formulation, sensory, process and IT teams to understand how data is actually captured, interpreted and used • Expert reviews to convert messy internal realities into a pilot that can realistically be tested • Identify the “human judgement points” where scientists still need to review, override or validate AI recommendations

Who is solving these challenges

Food & Functional Ingredient Discovery Specialists

Company	Validated Focus
Brightseed	Discovery of plant-derived bioactive compounds using its Forager AI platform
Nuritas	AI-driven discovery of bioactive peptides for health and nutrition applications
Shiru	AI-based identification of functional proteins and ingredient alternatives
NotCo	AI-assisted ingredient functionality mapping and food formulation
Taste wise	AI-driven consumer, menu, and food trend intelligence



Navigating the Ecosystem: How Hourglass Helps

How Hourglass Helps

- **Identify** relevant AI startups, vendors, and technology providers
- **Benchmark** capabilities beyond marketing claims
- **Validate** technical fit, maturity, and business relevance
- **Connect** clients with qualified partners
- **Support** pilot selection and business-case development

Sources: McKinsey Survey (2024); BCG Survey (2024); BCG Survey (2026), Hourglass Analysis, other secondary sources

Have Questions? Let's Connect!



US – SILICON VALLEY

Hourglass Research, LLC
LLC, 84 W Santa Clara Street, #700
San Jose, CA, US 95113
Phone: +1 510 698 2685
Email: gouraj@hourglassresearch.com



INDIA - BANGALORE

Hourglass Research Pvt. Ltd.
1154, 12th Main, Indiranagar,
Bangalore, Karnataka, India - 560038
Phone: +91 959 795 815
Email: Prashant.jha@hourglassresearch.com

Transparency & Disclaimer:

- This analysis incorporates insights from reputable sources, including the Special Eurobarometer survey by Kantar and the Euromonitor Sustainability Claims Tracker, enhanced by Hourglass Research's advanced analytics and strategic expertise.
- Content is for informational purposes only and not intended as specific technical, legal, or financial advice. For customized insights, let's connect.