



Byte-Sized Revolution

How cutting-edge tech is transforming the way we eat

A 2024 ADM Global Consumer Trend Series

Episode 2

Replacement Isn't the Future. Variety Is.



Understanding consumer trends and the impact of technology is essential for modern businesses to thrive

From increased connectivity and information access to advancements in artificial intelligence and hyper-personalization, new technologies are accelerating change and heightening expectations among consumers. A deep understanding of consumer wants, needs, attitudes and behaviors related to technology's impact on food and wellness products allows businesses to keep pace with current consumer-driven trends and anticipate where they are headed in the future.

As the industry leader in global consumer trends, ADM can help you apply this knowledge to innovation, to create products and services that resonate with consumers' ever-changing considerations and aspirations.



**Technology is rapidly altering the way consumers engage with food.
Is your brand ready for this byte-sized revolution?**

Technological acceleration is a macro force changing how global consumer trends are expressed in the marketplace

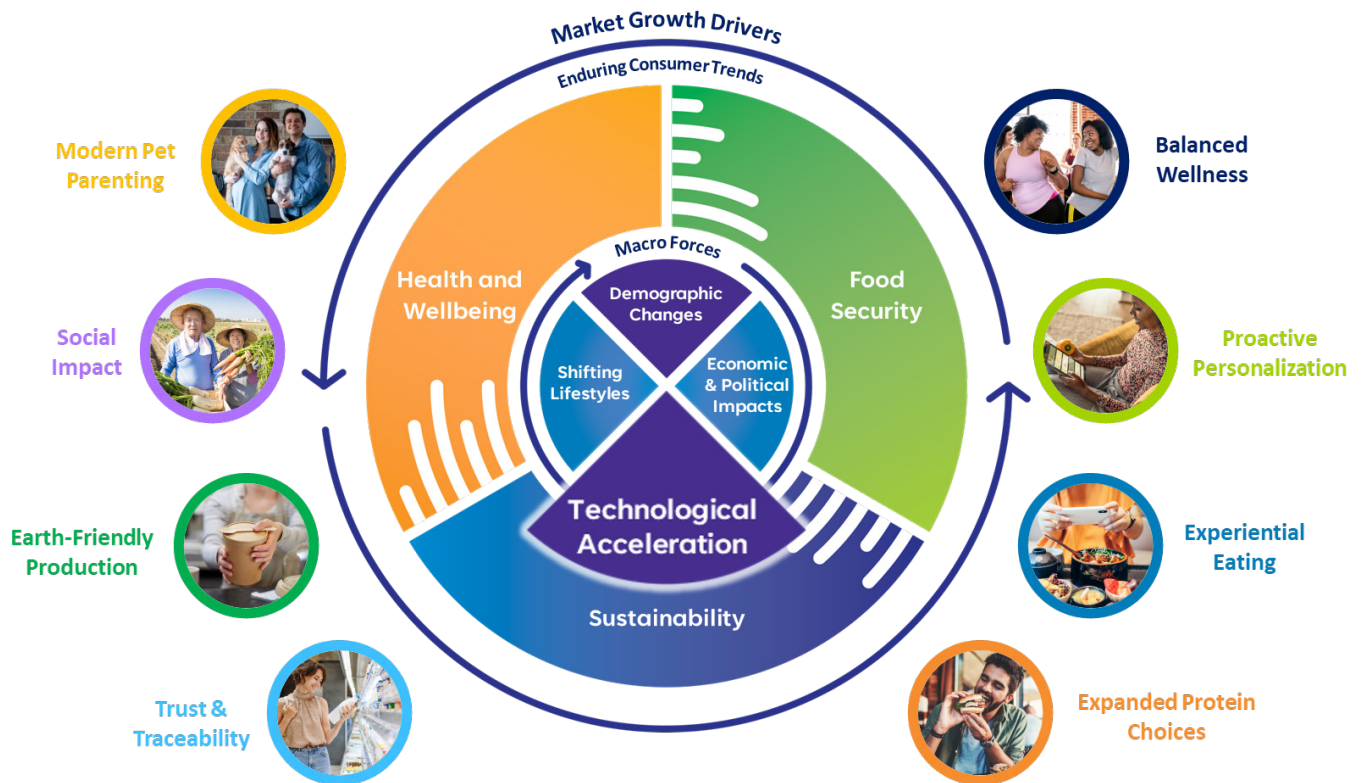
Based on in-depth proprietary research and a network of TrendXplorers around the world, each layer of the framework is key to understanding consumer behavior:

Macro forces: broad cultural shifts that impact across societies, markets and industries.

Enduring Consumer Trends: unifying principles that shape consumer demand for products and services.

Market Growth Drivers: A dissection of larger trends that highlight consumer attitudes, expectations, and behaviors which serve as starting points for brands to prioritize opportunities for innovation.

Global Consumer Trends Framework



[Learn more about global trends @ ADM.com/trends](https://ADM.com/trends)

Harnessing the power of the framework, ADM's Global Consumer Trend Series delves into 4 key areas that are rapidly transforming due to technology

These areas represent emergent shifts in consumer and industry behavior where technology is playing a transformative role.

**This is Episode 2:
Replacement isn't the Future.
Variety Is.**



Unapologetic Flavor & Color Experiences.

Multisensorial eating like never before



Replacement Isn't the Future. Variety Is.

Expanding food choices to meet lifestyle goals



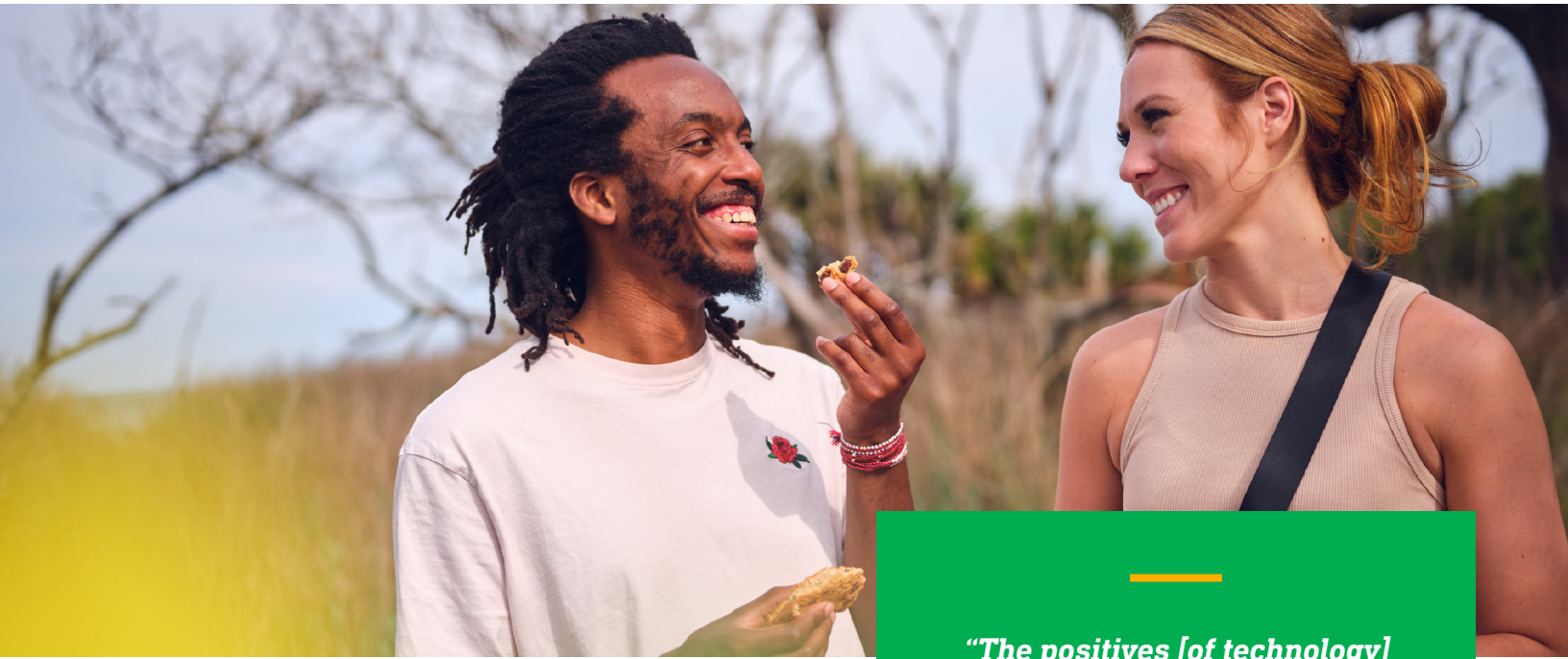
What's For Dinner? Data.

Optimizing everyday personal performance through data



The Next Big Tech Boom? It's on the Farm.

Transforming agriculture with next gen technology



2

Replacement Isn't the Future. Variety Is.

Having an abundance of choice is a fundamental component of modern food culture. Consumers want variety, and make decisions based on the occasion, social context, their mood, flavor preferences, and personal health or lifestyle goals.

Brands, manufacturers and farmers today are utilizing new and emerging technologies to cater to these consumer demands for exploration and discovery while also promising better nutrition, sustainability, flavor, and texture. The following are important manifestations of this trend in which brands today are delivering choice, reflecting spaces to which one can pay close attention as technologies continue to rapidly evolve.

- 1. Flexitarian Futures:**
Blending Technology with Protein Diversity
- 2. The Sweetest Thing:**
Balancing Taste & Wellness Goals
- 3. Click, Eat, Love:**
Feeding the World on Demand
- 4. Bark & Byte:**
High-Tech Food Choices for Modern Pets

“The positives [of technology] are that our eating habits will change for the better and dietary choices will be better. Reducing food waste, conserving biodiversity, reducing food related diseases, and balance the distribution of food worldwide.”

- U.S. Consumer, Age 25

64%

of US consumers believe science and technological innovations can make food more sustainable (+6pp from 2019)

60%

say that those innovations can make food healthier (+8pp from 2019)²

2: Hartman Group's Food & Technology 2023 Study

#1: Flexitarian Futures: Blending Technology with Protein Diversity

It's not about 'either/or'; it's about 'all of the above'

Today's conscious consumers are opting for a flexitarian approach to eating that includes both animal-based and alternative proteins that support a more resilient food system, while also aligning with their needs related to positive nutrition, exploration and flavor. In other words, it's not an "either/or" approach that consumers are taking, but rather an "all of the above" as they see the benefits of having a diverse range of proteins in their diet.

Brands today are turning to new and emerging science and technologies to help deliver a vast array of protein choices to consumers, including:

Proteins from responsibly raised and fed animals utilize on-farm technologies to create efficiencies while also improving quality, sustainability and nutrition, including:

- Technologies to help reduce greenhouse gas emissions and improve animal welfare.
- Regenerative agriculture technologies to improve soil quality and biodiversity in the feed industry.
- Digital tools designed to calculate the nutritional value of raw materials and meet the specific needs of animals.
- Science-backed feed formulations that mitigate risk of health challenges and antimicrobial resistance.

Hybrid technologies offer consumers more sustainable and protein-diverse products that combine plant-based ingredients and proteins with traditional animal proteins. This is allowing brands to:

- Innovate beyond the burger to offer formats that inspire home-chef consumers eager to explore the plant-forward world and experiment with on-trend, global cuisines.
- Address flexitarians' demands around taste and texture by bringing together the best of both worlds seamlessly using unique taste modulation technologies.
- Expand their consumer base by inviting carnivores to ease into the world of alternative proteins as they seek more diversity in their protein sources.
- Make proteins more accessible and affordable in developing regions.

Next generation technologies are still less familiar to consumers but present an opportunity to further expand the range of protein options available to them. Hybrid approaches have the potential to become an effective vehicle to gradually introduce them to the market as well.

- Precision and other forms of fermentation to improve flavor, functionality, nutrients and potential digestion concerns.
- Cell-cultivated meat to create more sustainable and humane (i.e., "animal-free") products.
- Molecular farming to create new specific compounds in plants.



57%

of global consumers are trying to increase the intake of proteins in their diets¹

6 in 10

global consumers are interested in trying alternative proteins developed using newer technologies¹

Definitely/probably open to trying...

	WORLD	NA	EMEA	AIPAC	LATAM
Plant-Animal Hybrids	63	45	59	68	73
Fermentation Derived	61	45	57	67	66
Cultivated Meat	59	44	56	62	67

¹: ADM Outside VoiceSM, Global Lifestyle Survey, 2023 (22 countries)

#2: The Sweetest Thing: Balancing Taste & Wellness Goals

Satisfy sweet teeth without compromising wellness goals

Advances in science and technology are allowing brands to address a fast-growing consumer trend: purposeful indulgence. Consumers often face strong tensions when deciding between “indulgent” and “healthy” offerings, trying to find an ideal balance between the two.

On one hand, indulgences consumed in moderation are viewed as an essential component of health & wellness, particularly as they relate to one’s mental and emotional well-being. On the other, indulgences can play a contentious role in consumers’ approach to wellness, particularly as they become more self-aware their own health.

Since consumers don’t want to give up all sweets, turning to reduced and sugar-free options featuring alternative sweeteners has become a tactic of choice. Brands are using formulation science and technologies to drive innovation and give consumers a variety of options from which to choose from in their efforts to strike a balance between treating themselves and managing wellness goals.

Sugar reduction is often driven by a variety of needs. Advancements in science and technology are helping brands broaden the range of options available to align with consumers’ personal goals or preferences, including products that cater to:

- Managing blood glucose levels and overall health
- Reducing calories with the goal of weight management
- Desires for less overtly sweet flavors and taste profiles
- Sustainable sourcing and processing

Sugar reduction “plus”, or low/no-sugar products that offer added features such as enhanced nutritional content, clean label, the inclusion of health and wellness ingredients and/or sustainability, are being increasingly sought after as achieving less sugars has become just as important as great taste and now consumers look for extra benefits on top of the basics of meeting sugar tallies.

As scientific formulations continue to expand the offerings in this space, such purposeful indulgences allow consumers to “feel good” about treating themselves – whether it’s supporting their own personal health or an environmental or social cause that aligns with their values. Consumers will see less conflict between food that is pleasurable and food that is good for themselves and for others as advances in ingredient innovation continue to be brought to the market.

1: ADM Outside Voice™, Global Lifestyle Survey, 2023 (22 countries)

2: ADM Outside Voice™, Sugar Reduction Study, 2021

3: ADM Outside Voice™, Sugar Reduction Study, 2023

4: ADM Outside Voice™, Blood Sugar Control Study, 2023



60%

of AIPAC consumers consider indulgent foods and beverages an important part of a healthy, balanced diet, 56% globally¹

77%

of European consumers rank taste and less sugar as equally important priorities when choosing a product²

53%

of Latin American consumers say that sugar being harmful to their bodies is the main reason why they are reducing its consumption, significantly more than those citing calories as the reason (35%)³

40%

of adult US consumers monitor their blood glucose level regularly at home with devices; most started doing so within the past 3 years⁴

#3: Click, Eat, Love: Feeding the World on Demand

Mealtime made easy, thanks to tech-enabled convenience

Prior advancements in digital and social media technologies have already facilitated stronger connections between brands and their consumers. Artificial intelligence (AI) is now propelling us into new domains, not only by speeding up the feedback mechanisms between brands and their shoppers, but also by predicting consumer behavior. These swift changes are taking the on-demand economy model to a new level, making 'convenience' more real than ever before.

Access to food on demand gives consumers freedom to make decisions that shift and conform to their needs for variety, schedules, whimsical tastes and inspirations. Technology has instilled a desire for, and expectation of, immediacy and instant gratification from products and services.

Consumers are looking for convenience before, during and after the moment of consumption, and technology is allowing brands to provide a broad range of convenient options across many situations and occasions:

- **Online and mobile/autonomous stores** allow consumer access to food and beverage quicker than ever via new delivery technologies and advancements in robotics.
- **Modern meal kit brands** are using science and technology to formulate meals based on specific health conditions, improve recipes using text analysis of customer feedback, and personalize the experience using predictive algorithms.
- **Smart cooking appliances and AI generated recipes** are enabling more options for at-home cooks to explore.
- **Drone deliveries, robotics, ordering apps powered by AI, ghost kitchens** and other tech advancements help improve access to food and beverage, even expanding the reach of foodservice operators.
- **Technology is enabling brands to address even the most niche needs** of consumer segments, from crunch-free solutions for **gamers**, to immersive food experiences using virtual reality (e.g., virtually exploring menus or restaurant kitchens) for **Gen Zers**.

While many of these new technologies may not be directly involved in how food and beverages are manufactured like in the other spaces explored, they have a great deal of impact on where, when, by whom they are consumed. Advances in research and development – including sensory science, AI, etc. – are allowing brands to expand their offerings across newer and constantly-evolving consumption occasions.



64%

of global consumers say that when it comes to preparing meals, they often choose what is most convenient & easy to prepare

Convenience is ranked 5th in attribute importance when buying F&B, after quality, taste, price & health and before sustainability¹

51%

of global consumers sometimes/often scan bar codes at the store to learn more about the products they are shopping for¹

¹: ADM Outside VoiceSM, Global Lifestyle Survey, 2023 (22 countries)

#4: Bark & Byte: High-Tech Food Choices for Modern Pets

The future is filled with choices for our furry friends too

While ownership rates and general views of pet parenthood can vary across countries, regions, and individual households, the increasing humanization of pets and their needs has led to a widespread belief that pets' lifestyle, health care, and nutritional needs mirror our own. As with humans, choice is an essential value for pets and pet parents. Today, brands are leveraging technology to deliver a variety of options to pet parents across all three human trend areas:

- **Protein exploration:** From well-sourced real meat cuts (free-range chicken, grass-fed beef) and human-grade plant-based proteins to insect-based and those created using new food technologies (cultivated meat, precision fermentation), brands are providing a range of proteins that cater to demands for nutrient density, sustainability and variety across pet species.
- **Targeted functionality:** Pet parents are seeking out meals (and treats!) that not only support their pet's physical health, but also taste good and bring delight to their pets. From scientifically tailored solutions based on pets' specific health requirements to providing a variety of flavors, textures and formats utilizing taste and flavor modulation and manufacturing technologies, brands are delivering on pet parents' needs to appeal to both physical and emotional wellbeing.
- **Tech-fueled variety:** As with their own food, pet parents have become more accustomed to getting a variety of options for their pets delivered straight to their door, all of which wouldn't be available without advancements in technology (e.g., online-sourced fresh prepared meals/meal kits that utilize AI to suggest new foods/treats based on previous purchases; on-demand delivery via mobile apps). At-home conveniences such as monitors and automatic food dispensers allow pet parents to remotely feed their pets meals/treats and provide emotional comfort (i.e., talk to them) in real time.

Brands are also using technology to inform and educate pet parents about food options available for their pets. Social media sites such as YouTube, for example, have become common platforms used by pet parents to learn more about new foods.



85%

of global pet owners agree that proper nutrition and supplements are as important for their pets as themselves¹

50%

of global pet owners are open to testing their pets' DNA to develop a personalized nutrition plan²

Digestive Health 42%
Longevity 37%
Energy Level 37%

are the top 3 health concerns parents have about their pets²

43%

of pet parents in Brazil use YouTube to get information about new food, treats and supplements for their pets; 38% in Mexico, 34% in the US³

1: ADM Outside VoiceSM, 2023

2: ADM Outside VoiceSM, Global Lifestyle Survey, 2023 (22 countries)

3: ADM Outside VoiceSM, 2023

Variety is the future, and ADM can help turn rapid technological advancements into growth opportunities

Advancements in food science and technology are helping food and beverage companies expand the landscape of options to meet consumers' (and their pets') calls for increased variety in the marketplace.

ADM has the tools to help you harness these advancements and create products that keep up with consumer demands:

- A direct line to consumer trends around the globe monitored via our team of TrendXplorers
- A robust supply chain that lays the foundation for unparalleled ingredient portfolios in human and animal nutrition
- Culinary ingenuity for a holistic, inspired approach to product development in an array of categories
- Technical expertise that unlocks breakthrough innovations and end-to-end capabilities
- Continuous investment in the technologies of tomorrow through ADM Ventures

**Stay tuned for upcoming episodes...
this is a Byte-Sized revolution you won't want to miss!**

Learn more @ADM.com/trends



1 Unapologetic Flavor & Color Experiences.



2 Replacement Isn't the Future. Variety Is.



3 What's For Dinner? Data.



4 The Next Big Tech Boom? It's on the Farm.