
CHANGING FOOD HABITS IN THE POST-COVID ERA: AN INTERDISCIPLINARY STUDY OF TECHNOLOGY AND ARTIFICIAL INTELLIGENCE

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Abstract :

The COVID-19 pandemic brought unprecedented disruptions to global routines, significantly altering people's dietary patterns and food behaviors. As movement restrictions, lockdowns and health anxieties shaped everyday life, individuals increasingly relied on digital platforms and artificial intelligence (AI) tools to access, choose, and prepare food. This interdisciplinary study examines how food habits transformed in the post-COVID era and explores the pivotal role that technology—especially AI—played in mediating these changes. Drawing upon existing literature, case studies, and theoretical frameworks from nutrition science, consumer behavior, and information technology, this paper investigates shifts in food procurement, consumption preferences, health and wellness priorities, and digital food systems. Findings suggest that the pandemic acted as an accelerant for AI adoption in food choices, with lasting implications for public health, food marketing, and future research agendas.

Introduction :

Context and Background :

The COVID-19 pandemic—caused by the SARS-CoV-2 virus—emerged in late 2019 and rapidly evolved into a global health crisis, affecting all aspects of daily life. Beyond its immediate health consequences, the pandemic triggered profound socioeconomic disruptions, influencing livelihoods, mobility and social practices. Among these, food habits experienced dramatic changes as individuals adjusted to new realities such as market closures, reduced physical mobility, remote working, and heightened health consciousness.

Changes in food habits encompass not only what people eat but also how, where, and why they make food choices. The pandemic accelerated trends that were already emerging—digitization of food services, growing health awareness, and reliance on technology for remote interactions. In this context, Artificial Intelligence (AI) emerged as a key enabler, reshaping food consumption patterns through personalized nutrition, predictive analytics, recommendation systems, food delivery optimization and smart kitchen technologies.

Research Objectives :



The primary objectives of this paper are to :

1. **Analyze changes in food habits** post-COVID-19.
2. **Explore the role of technology and AI**, particularly how AI influenced dietary decision-making, food access, and health outcomes.
3. **Provide insights into future directions** for research and practical applications in food systems and public health.

Scope and Limitations :

This study integrates diverse disciplinary insights—nutrition science, consumer behavior, digital technology, and AI—to provide a holistic understanding of food habit changes. However, limitations include reliance on secondary literature and theoretical frameworks rather than primary data collection, and a broad scope that may not capture all regional or cultural specificities.

Literature Review :

Changing Food Habits During and After COVID-19 :

The pandemic altered daily life in fundamental ways. Lockdowns and social distancing restricted physical access to food outlets, leading many people to cook more at home and rely on long-lasting food items. Food choices became influenced by concerns over health, immunity, and food safety. Studies during the pandemic documented:

- Increased demand for fresh produce and immunity-boosting foods.
 - Decline in consumption of highly processed and restaurant foods.
 - Increased snacking and comfort eating among certain demographic groups.
- These behavioral shifts reflect a complex interplay between psychological distress, health priorities, and environmental constraints.

The Rise of Digital Food Services :

Digital food platforms—groceries, restaurant delivery apps, meal kit services—saw exponential growth during COVID-19. As markets closed and people stayed indoors, mobile apps and websites became primary conduits for food procurement. This digitization not only provided convenience but enabled data collection on user preferences, which later fueled AI-driven personalization.

Artificial Intelligence in Food Systems :

AI refers to computational systems capable of performing tasks that normally require human intelligence. In food systems, AI can:

- Analyze consumer data to predict trends and preferences.



- Offer personalized nutrition recommendations.
- Support supply chain optimization to reduce waste.
- Enhance automation in food production and service delivery.

Recent research shows how AI algorithms improve food recommendation systems, generate tailored diet plans, and even monitor dietary habits using wearable sensors and image recognition..

Theoretical Framework :

This study rests on three theoretical pillars:

1. Consumer Behavior Theory :

Based on the premise that consumer choices are influenced by psychological, social, and situational factors, this framework helps explain how pandemic-induced stress, health concerns, and lifestyle changes shaped food habits.

2. Technology Acceptance Model (TAM) :

TAM explains how users adopt new technologies based on their perceived usefulness and ease of use. In the context of food choices, the model helps explore why individuals increasingly embraced AI-based tools for meal planning, grocery shopping, and nutrition tracking.

3. Health Belief Model (HBM) :

HBM suggests that perceptions of susceptibility to illness and perceived benefits of preventive action influence health behaviors. COVID-19 heightened awareness of vulnerability, prompting shifts toward healthier eating and wellness monitoring with the help of technology.

Methodology :

1. Research Design :

This is a **qualitative interdisciplinary study** based on:

- Literature review of academic articles, reports, and case studies.
- Theoretical synthesis from multiple disciplines.
- Interpretive analysis of AI's applications in food systems.

2. Data Sources :

Primary inputs include peer-reviewed journals in nutrition, technology, and behavioral sciences; industry reports from digital food service providers; and case narratives



from AI applications in food contexts.

3. Analytical Approach :

The study uses thematic analysis to identify recurring patterns in how food habits changed and how AI technologies influenced these trends. Cross-disciplinary insights were integrated to construct a comprehensive understanding.

Findings and Analysis :

1. Food Habit Changes in the Post-COVID Era :

1.1 Increase in Home Cooking :

Lockdowns and health concerns led many individuals and families to cook more at home. This shift resulted in:

- Greater experimentation with recipes.
- Increased use of fresh ingredients.
- Rediscovery of traditional cooking practices.

Home cooking also fostered deeper awareness of nutritional content and food sourcing.

1.2 Health and Immunity Focus :

Public discourse during the pandemic emphasized nutrition as a defense against illness. Individuals reported:

- Higher consumption of fruits, vegetables, and micronutrient-rich foods.
- Lower intake of fast foods and sugary snacks.
- Increased interest in dietary supplements and functional foods.

1.3 Digital Food Procurement :

Online grocery shopping, meal kit subscriptions, and food delivery apps became mainstream. Convenience, safety, and reduced physical contact were key drivers in this shift.

Role of AI in Shaping Food Behaviors :

1. Personalization of Diet and Nutrition :

AI-powered apps and platforms can analyze user data—such as age, weight, health goals, activity levels—and generate customized meal plans. These technologies influence food choices by:

- Suggesting healthier alternatives.



- Tracking nutrient intake through image recognition.
- Providing adaptive feedback based on user behaviors.

For example, users of AI nutrition apps report increased engagement with health goals and improved dietary self-monitoring.

Intelligent Recommendation Systems :

Recommendation algorithms, common in food delivery platforms, predict user preferences based on past orders and ratings. This influences:

- Repeated food choices.
- Exposure to new cuisines or healthier options.
- Timing and frequency of orders.

AI recommendations can nudge users toward certain food categories—beneficial when oriented toward nutrition, but potentially problematic if optimized only for sales.

Supply Chain and Operational Efficiency :

AI enhances efficiency in food supply chains and delivery systems:

- Predictive analytics forecast demand, reducing food waste.
- Route optimization improves delivery times.
- Automated inventory systems ensure stock availability.

These operational improvements indirectly influence consumer behavior by increasing access and reliability.

Smart Kitchen Technologies :

AI-enabled appliances—smart refrigerators, voice-activated ovens, food recognition tools—support food preparation and reduce cognitive load. These technologies:

- Help users plan meals.
- Reduce food spoilage.
- Suggest recipes based on available ingredients.

Such tools make healthy eating more attainable, especially for time-strained individuals.

Discussion :

Interplay Between AI and Food Choice Psychology :

AI doesn't just react to user behavior—it shapes it. Through recommendations and feedback loops, AI can reinforce habits, encourage experimentation, and support health goals.



However, ethical issues arise when algorithms prioritize engagement over well-being or when biases in data skew suggestions.

Understanding this interplay requires integrating psychological theories with computational models. For example, AI can amplify positive health behavior by reinforcing self-efficacy (a person's belief in their ability to succeed) and creating habit loops that align with healthy norms.

Equity and Accessibility Concerns :

While AI holds promise, digital divides persist:

- Not all populations have access to smartphones or reliable internet.
- Older adults may face barriers to adopting technology.
- Socioeconomic status influences access to AI-enabled services.

These disparities mean the benefits of AI in food systems are not equitably distributed. Addressing this requires policies that promote digital inclusion and affordable access.

Implications for Public Health Policy :

The pandemic highlighted the importance of nutrition for resilience against illness. Policymakers can leverage AI to:

- Develop public health campaigns based on real-time dietary data.
- Use AI to monitor population health trends and nutritional gaps.
- Partner with tech companies to design algorithms that promote public health goals.

However, regulatory frameworks must ensure data privacy and ethical use of AI.

Sustainability and Food Systems :

AI's role extends beyond individual choices to systemic sustainability:

- Optimizing supply chains reduces waste and carbon emissions.
- AI can support precision agriculture for better yields.
- Digital platforms can encourage sustainable consumption through carbon footprint indicators.

Integrating AI with sustainability goals can help address long-term challenges in global food security.

Conclusion :

The COVID-19 pandemic acted as a catalyst for change in food habits and accelerated the integration of technology—especially AI—into everyday food experiences. From



influencing what people eat, how they procure it, and how they think about nutrition, AI has become a significant mediator in contemporary food systems.

This paper's findings underscore that changes in food behavior are not simply a by-product of a global crisis but reflect deeper transformations in how individuals interact with technology and perceive health.

AI's potential to enhance personalized nutrition, streamline food services, and support public health is significant. However, realizing this potential requires ethical governance, attention to equity, and an interdisciplinary approach that bridges technology with human behavior, health, and societal values.

Future Research Directions :

1. **Empirical studies** examining long-term behavioral changes in diverse populations post-pandemic.
2. **AI effectiveness evaluations**—measuring real health outcomes from AI diet apps and recommendation systems.
3. **Ethical frameworks** for responsible AI in food systems.
4. **Impact studies** on sustainable food consumption driven by AI metrics and nudges.
5. **Policy analysis** on data governance, accessibility, and digital literacy in AI adoption.

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