

The Green Revolution in Blind Boxes: When the "Leftover Food Economy" Rewrites the Script of Sustainable Consumption

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Abstract: This paper delves into the concept of the "leftover blind box" economy, presenting it as a groundbreaking solution to the pervasive problem of global food waste. It provides a comprehensive analysis of the current state of this nascent economy, highlighting its far-reaching impacts and outlining potential future trajectories. The leftover blind box model stands out as a multi-faceted approach that not only mitigates food waste but also fosters economic growth, environmental sustainability, and social welfare. By transforming surplus food items into valuable products and offering them to consumers at discounted prices, this model encourages sustainable consumption practices. While there are obstacles to overcome, such as ensuring food safety and addressing consumer perception challenges, technological advancements and strategic implementations are progressively clearing the path for widespread acceptance. Through these collective efforts, the leftover blind box model holds the promise of becoming a prevalent practice in sustainable consumption, catalyzing meaningful change across the globe.

Keywords: Leftover blind box, sustainable consumption, environmental benefits

1. Introduction

Food waste is a pressing global issue. According to the Food and Agriculture Organization of the United Nations, around 1.3 billion tons of food are wasted every year, accounting for about one-third of all food produced for human consumption [1]. This waste is not merely a loss of resources; it has significant environmental, social, and economic consequences [2]. It squanders the water, land, and energy used in food production. Moreover, when food decomposes in landfills, it releases methane, a potent greenhouse gas contributing to climate change [3]. In response, the "leftover blind box" economy has emerged as an innovative solution, transforming the way people handles food waste, how consumers shop, and the operations of the food service industry.

The concept of leftover blind boxes is simple yet revolutionary. Restaurants, cafes, bakeries, and supermarkets gather surplus or soon-to-expire food items, pack them into mystery boxes, and sell these boxes at a discounted price, typically 30-50% less than the regular retail price [4]. For consumers, it offers a chance to obtain a variety of food at a lower cost. For food providers, it turns what would otherwise be waste into a revenue source [5]. This model has gained popularity as more people recognize the negative impacts of food waste and seek practical solutions. This research is

significant as it provides in-depth insights into a novel economic model that addresses a major global problem, offering potential solutions for sustainable consumption and resource management.

2. Current status of the leftover blind box economy

Mobile apps have been instrumental in the rapid expansion of the leftover blind box economy. One of the most prominent platforms is Too Good To Go. Launched in Denmark in 2016 with the mission to reduce food waste, it has become a global phenomenon, spreading across Europe, North America, and Asia. As of 2024, Too Good To Go has over 100 million users and has partnered with more than 170,000 food providers [6]. On the app, food providers list their available leftover products, including details such as food type, quantity per box, and price. They often enhance the appeal with enticing images and descriptions.

Consumers can browse local options on the app, using features like search filters based on cuisine type, price range, and distance. After purchase, they are given a specific time window to pick up the blind box at the designated outlet. The platform operates on a commission-based model, charging food providers around 20-30% of the sale price. This revenue covers app-related costs while allowing food providers to recoup some of their investment in surplus food.

Another notable platform is Karma, which has a strong presence in several European countries and Canada. Karma differentiates itself by building a vibrant community around the leftover blind box concept. It encourages users to share their experiences on social media using dedicated hashtags. This user-generated content promotes the platform and fosters a sense of community, attracting new customers. Additionally, Karma provides food providers with in-depth analytics, offering insights into peak purchasing times, popular food items, and consumer demographics. For example, a bakery might discover through Karma's analytics that its sweet pastries in blind boxes are popular among young adults on weekends, enabling it to adjust production, packaging, and marketing strategies.

Delving into the psyche of consumers is essential for the thriving of the leftover blind box market. Cost-saving is not just a motivator; it's a beacon that guides many shoppers through the economic maze of modern life. In a time when the cost of living is soaring, particularly in bustling metropolises, the temptation of securing a bargain on meals is almost irresistible. A thorough survey conducted across major U.S. cities revealed that a staggering 75% of those who indulged in leftover blind boxes did so primarily for the sake of cost-effectiveness. This trend is especially pronounced among young professionals and students, who, despite their limited financial resources, yearn for a varied and enriching culinary journey. Their choice to purchase these boxes is not merely a financial decision; it's a strategic move that allows them to explore new flavors and dining experiences without breaking the bank. This behavior underscores a broader societal shift towards value-driven consumption, where the thrill of the deal meets the need for quality and diversity in food choices.

However, the appeal of leftover blind boxes extends beyond cost-savings. They have captured the imagination of consumers not just for their economic benefits but also for their role in promoting environmental stewardship. Environmental consciousness is increasingly influencing consumer decision-making, as people become more aware of the impact their choices have on the planet. A detailed study conducted in the United Kingdom revealed that 60% of regular blind box buyers were motivated by the desire to reduce food waste and contribute to environmental sustainability. This statistic underscores a significant shift in consumer behavior, where the act of purchasing is no longer just about personal gain but also about making a positive impact on the environment. With increased media coverage of climate change and environmental degradation, consumers are more aware of their responsibilities and the consequences of their actions. The concept of a circular economy, where resources are reused and waste is minimized, is gaining traction. Purchasing leftover blind boxes gives consumers a tangible way to make a positive impact by diverting food from landfills and conserving resources. It's a small step that reflects a larger commitment to sustainability. This trend

is not just limited to food; it spans across various industries, from fashion to technology, where consumers are opting for products that promise to reduce their carbon footprint. The leftover blind box phenomenon is a testament to the growing movement of conscious consumption, where every purchase is a vote for a more sustainable future.

The element of surprise associated with blind boxes also adds an exciting dimension to the shopping experience, particularly for younger consumers who are always on the lookout for something new and thrilling. People are drawn to the novelty of not knowing what's inside the box. A research report on consumer trends in the Asia-Pacific region indicated that these younger demographics were more inclined to purchase leftover blind boxes due to the thrill of the unknown. Many consumers document and share their unboxing experiences on social media, further fueling the popularity of the concept. This trend has become a cultural phenomenon, where the anticipation of opening a blind box is likened to the excitement of unwrapping a gift on a special occasion. The mystery and the joy of discovery have turned blind boxes into a must-have item for many, not just as a form of entertainment but also as a way to express individuality and connect with a community of like-minded enthusiasts. The allure of blind boxes transcends mere commerce; it taps into the universal human desire for surprise and the pleasure of sharing those moments with others.

3. The impact of the leftover blind box economy

3.1. Advantages

The impact of the leftover blind box economy on the food service industry is far-reaching and multi-faceted. For food providers, it offers a practical solution to the long-standing problem of food waste. Instead of incurring disposal costs, potential legal liabilities, and negative environmental impacts, they can turn surplus food into a revenue-generating opportunity. A case study of a chain of cafes in France showed that after implementing the leftover blind box system, the cafes reduced food waste by 45% and saw a 15% increase in overall revenue from box sales. This additional revenue can be reinvested in the business, such as improving ingredient quality, enhancing the customer experience, or expanding to new locations.

Participating in the leftover blind box economy can also enhance a food provider's corporate social responsibility (CSR) image. In an age where consumers are more conscious of a company's environmental and social impact, being associated with a waste-reduction initiative can boost brand reputation and customer loyalty. A survey of Australian consumers found that 80% were more likely to patronize a food establishment that actively participated in food waste reduction programs like the leftover blind box system. This positive perception can also attract investors interested in sustainable businesses, providing food providers with additional financial resources for growth.

On a macroeconomic level, the leftover blind box economy can contribute to overall economic efficiency. By reducing food waste, it conserves valuable resources like water, energy, and land, which can be redirected to other productive activities. For example, the water saved from not producing wasted food can be used in manufacturing or agricultural irrigation. Additionally, the growth of this economy creates new employment opportunities across various sectors, including app development, customer service, delivery, data analytics, marketing, and quality control.

The environmental benefits of the leftover blind box economy are substantial. Food waste is a major contributor to greenhouse gas emissions. By diverting surplus food from landfills, the leftover blind box model significantly reduces methane emissions. It also decreases the demand for new food production, conserving water, energy, and land resources. Producing one kilogram of beef requires approximately 15,415 liters of water, and growing one kilogram of wheat consumes around 1,500 liters of water. Every kilogram of food saved through the system represents a significant conservation of these resources. Moreover, reduced food production leads to a decrease in the use of fertilizers and

pesticides, which is beneficial for soil quality, water bodies, and biodiversity. Additionally, the reduction in food waste also helps to cut down on the carbon emissions associated with food production, transportation, and storage. This further mitigates the environmental impact and contributes to a more sustainable future.

The social implications of the leftover blind box economy are equally important. It can contribute to food security by making food more accessible to low-income individuals and families. The discounted price of blind boxes allows those with limited financial resources to obtain a variety of nutritious food items. In some cities, partnerships between food providers, platforms, and local charities or community organizations have been established to distribute leftover blind boxes to those in need. These initiatives not only help reduce food waste but also foster community engagement. For example, in a city in Sweden, a collaboration between a local food bank and several restaurants on the Too Good To Go platform has successfully distributed blind boxes to homeless shelters and low-income households, alleviating hunger and promoting social inclusion and equality, while also enhancing the community's sense of solidarity.

3.2. Challenges

Despite its advantages, the leftover blind box economy faces challenges. One of the most significant is food safety. Since the food in these boxes may be close to its expiration date, there is a risk of spoilage. Food providers must implement strict quality control measures, including proper storage at the right temperature, careful handling to prevent contamination, and accurate labeling with information about allergens and expiration dates. Regulatory bodies play a crucial role in setting and enforcing these standards. In the European Union, for example, there are specific regulations regarding the sale of near-expiration food, covering storage conditions, shelf-life labeling, and hygiene requirements [7]. However, ensuring compliance can be complex and resource-intensive, especially for small-scale food providers.

Another challenge is the perception of the food in blind boxes. Some consumers may associate leftover food with lower quality or lack of freshness, although this is often not the case. Overcoming this perception requires effective marketing and communication strategies from food providers and platforms. They need to educate consumers about the quality of the food, emphasizing that surplus or near-expiration food is not necessarily of poor quality. Transparency about food sourcing, preparation, and storage is key to building trust. Highlighting the use of high-quality ingredients, proper cooking methods, and state-of-the-art storage facilities can help reassure consumers. Furthermore, engaging with consumers through social media and interactive platforms can provide additional insights into their concerns and preferences. Testimonials from satisfied customers, positive platform reviews, and the sharing of behind-the-scenes footage of food preparation and storage processes can further change consumer perceptions and build a stronger reputation for blind box food services. By actively addressing these concerns and showcasing the dedication to quality and transparency, food providers can gain the trust and loyalty of consumers.

Logistical challenges also impede the smooth operation of the leftover blind box economy. Coordinating pickup times and locations between food providers and consumers can be complex, often involving numerous communications and adjustments. Delays or misunderstandings in this process can lead to customer dissatisfaction and wasted food. Some consumers may forget their pickup time, while food providers may face unexpected schedule changes or cancellations. To address these issues, many platforms are implementing more user-friendly scheduling systems, such as email and mobile push notifications, which help to streamline the communication process [8]. These systems also provide real-time updates on pickup location or time changes, ensuring that both parties are always informed. For perishable items, food providers are using insulated bags and containers to maintain food quality during pickup, further enhancing the overall experience for consumers.

4. Future outlook

Looking towards the future, the leftover blind box economy has significant growth potential. As global awareness of environmental issues continues to increase, and consumers become more committed to sustainable consumption, the demand for such services is likely to rise. Technological advancements will play a crucial role in the evolution of this economy. The integration of artificial intelligence (AI) and machine learning algorithms can optimize the matching of food providers and consumers [9]. These technologies can analyze vast amounts of data, including consumer purchase history, food provider inventory levels, and local demand patterns, to predict demand more accurately. This will enable food providers to better plan their surplus food production and packaging, further reducing waste. AI-powered chatbots can also enhance customer service by answering frequently asked questions and providing support to both food providers and consumers.

Moreover, there is great potential to expand the blind box model beyond the food service industry. The fashion industry could adopt a similar approach for surplus or out-of-season clothing, offering consumers the chance to discover new fashion items at a discounted price while reducing textile waste. The beauty industry could use the blind box concept for near-expiration products, allowing customers to try out different beauty products without breaking the bank. Even the electronics industry could explore the idea for refurbished or excess inventory items. Such expansions could lead to the creation of a more comprehensive circular economy, where waste is minimized across multiple sectors.

5. Conclusion

In conclusion, the leftover blind box economy represents a significant step forward in the pursuit of sustainable consumption. It offers a practical and effective solution to the global problem of food waste, while simultaneously providing economic, environmental, and social benefits. Although it faces several challenges, with the right strategies, policies, and technological advancements, this innovative economic model has the potential to become a mainstream practice. Policymakers could consider providing incentives for food providers to participate in the leftover blind box economy, such as tax breaks or subsidies for implementing quality control measures. They could also invest in public awareness campaigns to educate consumers about the benefits of the model and address concerns related to food safety and quality. As consumers, businesses, and policymakers continue to search for ways to address the pressing issues of environmental sustainability and resource management, the leftover blind box economy serves as a promising example of how creative solutions can drive positive change on a global scale. By embracing this model, the research can take a significant stride towards a more sustainable future, where food waste is minimized, resources are conserved, and economic opportunities are created for all.

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