Surplus Food in Blind Box Form

Subjects: Others

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Surplus foods are fresh raw material of food that has not been processed, and a large number of surplus foods are discarded and wasted every day. As a new business model, a surplus food blind box can attract consumers to purchase to reduce food waste.

surplus food   blind box   perceived risk   perceived value   purchase intention

1. Background

Approximately 1.6 billion tons of primary product equivalents of food waste are generated globally annually, of which 1.3 billion tons are edible, according to the Food and Agriculture Organization (FAO) of the United Nations. The annual food waste is equivalent to about 3.3 billion tons of CO_2 emitted into the atmosphere [1]. Moreover, the wastes of resources caused by food waste will also increase along with the population growth index, resulting in individual, family, collective economic losses, etc. [2]. Since China has a large agricultural and population base, the country faces resource shortages and increased food demand in addition to food waste (**Table 1**) [3]. Hence, reducing food waste could contribute to improving social sustainability, reducing poverty, and reducing the environmental impact of more than one billion tons of food waste that is disposed of in landfills each year [4]. However, the question remains as to how to reduce food waste.

Table 1. Current state of food waste in China.

Measurements	Description
Food waste in China annually	Approximately 17 to 18 metric tons of food are wasted annually [5], which produces 54 metric tons of carbon dioxide equivalent emissions, consumes 24 metric tons of water, and occupies 23 million hectares of land [6].
Food waste in Chinese households annually	About 5.5 metric tons of food are wasted annually, equivalent to 22% of total food production. For vegetables and fruits, this percentage is even higher [7].
Amount of food wasted per Chinese per day	It is about 93 g per meal, about 279 g three times a day [8].

According to the Sustainable Development Goals (SDGs), adopted by UN member states in 2015, point 12 'Responsible Production and Consumption'. "Halve global food waste at retail and consumer levels by 12.3-2030, and reduce food losses in production and supply chains, including post-harvest losses, is particularly instructive for countries and organizations all around the world [9]. It is important to note that the continuous improvement of the food waste hierarchy (FWH) by different organizations and academics is providing a comprehensive framework.

The potential actions that should be prioritized include preventing surpluses of food and extracting new value in the form of new edible and non-edible products [10][11]. Furthermore, it provides guidelines such as Redistribution of surplus food, Reuse of food for human consumption, and Recycling [12].

2. Surplus Food Blind Boxes

The Blind Box originated in Japan, where the IP Pan-entertainment industry is relatively developed. It refers to the same series of boxes, each containing an assortment of products with a different style or material combination [13]. The special feature of the product is that the outer packaging will not give consumers too many clues. Only after opening the package will consumers understand what or which product they have purchased. Blind boxes have become increasingly popular in recent years due to factors such as the trendy game economy. With the popularity of blind box products, more and more fields (including the food industry) have adopted the sales model of blind box products, attracting a large number of consumers.

In addition to reducing food waste, surplus food blind boxes may provide a solution to young people experiencing anxiety regarding takeout choices. As a form of novelty consumption, the surplus food blind box caters to young consumers' curiosity, expectation, and "gambling" psychology to some extent [14]. There is no doubt that surplus food blind boxes can stimulate consumption among young consumers to a certain extent. Meanwhile, surplus food in blind boxes can effectively reduce food waste and ensure the maximum utilization of agricultural products as an innovative method of repurposing surplus food. Additionally, it contributes considerably to the reduction of carbon emissions and the enhancement of economic growth.

3. Relevant Studies

3.1. Perceived Value

A value is a reflection of the best capital cost optimization associated with purchase or production, resulting in a high-value (use-value) and attractive (premium-value) product or service for the customer [15]. Perceived value is the value of a product or service as perceived by consumers and may be viewed as a trade-off between perceived benefits and perceived expenses [16]. Consumers return to businesses or companies with a high perceived value [17]. Among Zeithaml's value attributes, perceived value is increasingly skewed toward "low price", "any product I want", "quality for the price I pay", and "what I pay for" [18]. In other words, consumers are more inclined to evaluate a surplus food blind box based on its value rather than its price. This is one of the joys of blind boxing. Consumers may perceive high perceived value when they believe the products in the blind box are in line with or exceed their expectations or expectations set by the price. Additionally, numerous scholars have confirmed that value is a prerequisite for the intention to purchase [19][20].

3.2. Perceived Risk

In contrast to perceived value, perceived risk refers to the potential impact of a purchase on the consumer [21]. Consumers may consider the risks of surplus food blind boxes, such as whether the surplus food is still fresh or edible, whether it will not match the price, whether the combination of ingredients is as expected, etc. Especially in this time of COVID-19 pandemic, there could also be concerns about contamination through contagious routes, food preparation, packaging, or contact with delivery personnel [22]. This expected risk may affect consumers' perceptions of value. As a result, the decision of the consumer is based on the balance between the perceived benefit and the perceived risk of the product or service. Therefore, if consumers perceive higher risks, the perceived value or purchase intention of surplus food blind boxes is likely to be lower [23].

3.3. Subjective Norm

It is common for people to follow social norms not only because they fear social pressure, but also because they provide information about what behaviors are considered appropriate or beneficial [24]. In TPB, subjective norms generally refer to a belief that a significant person or group of people will approve and support a particular course of action [25]. In this regard, subjective norms refer both to the perceived social pressure on one's actions and to the individual's motivation to conform to others' views. In the context of food, subjective norms are primarily employed to infer the influence of others on consumers' own purchasing decisions, or food waste behavior [26][27]. For surplus food blind boxes, the interaction between consumers, especially the frequent communication between young people, is important. For example, the big V sharing on Moments, Weibo, Tiktok, and Bilibili might provide a preliminary assessment of the value or risk of surplus food blind boxes, and it may also encourage purchase and use.

3.4. Perceived Food Quality

Food quality is the most important factor affecting customer satisfaction and a willingness to return to a full-service restaurant, including delivery, takeout, or surplus food blind boxes, etc. [28]. It represents the restaurant's core characteristic, with a very tangible character. Food quality metrics include freshness, health, deliciousness, and appearance [29]. Consumers' perceptions and evaluations of physical quality of surplus food blind boxes are influenced by the different quality indicators. For instance, the quality of blind box packaging, the ease of opening, the freshness of the contents, the health benefits, or the experience of the entire process. Therefore, perceived food quality might be an important antecedent factor influencing consumers' purchase intentions for surplus food blind boxes.

3.5. Brand Image

The brand image is defined by the perception of the brand as reflected by the memories associated with the brand [30], to be recognized in the minds of consumers through the affinity, strength, and uniqueness of brand associations [31]. Thus, the more consumers trust and loyalty they have to a brand, the higher their perception of its image is. In particular, big brands that have been for a long time have a solid reputation among consumers. He and Song implemented a surplus bag (blind box equivalent) experiment in China, where they used public welfare promotion methods to enhance consumers' willingness to purchase [32]. It should be noted that many big brands,

such as IKEA [33] and Starbucks [34], have also entered the "to good to go" app market, where they are selling surplus blind boxes. Surplus Food Blind Boxes of known brands are deemed less risky by consumers than it of unknown brands, and consumers' perceptions and trust are also likely to be higher.

3.6. Perceived Playfulness

An individual's perceived playfulness is defined as "the degree to which he or she finds an interaction enjoyable and intriguing and that he or she is interested in it" [35] and is generally used in human–computer interaction [36], blended learning scenarios [37], social networking sites [38], and less prevalent in the field of food. Nevertheless, in researchers' opinion, a series of possible scenarios or actions, such as knowing, ordering, anticipating, unpacking, tasting, or evaluating, may make consumers feel excited and may facilitate a flow experience from surplus food blind boxes. In flow theory, a positive subjective experience is one of the primary reasons for performing an activity [35]. Therefore, if the experience perception of the surplus food blind boxes is high, the consumer's various evaluations may be improved accordingly, which will affect their subsequent behavior.

3.7. Perceived Variety

The surplus food blind boxes may be prepared from a variety of raw materials, and different outlets use different cooking methods and are influenced by a variety of other factors. Therefore, researchers must understand how consumers perceive this aspect. This may be due to perceived variety. In general, category awareness is determined by the actual content of the selection aggregate and the characteristics of the classification scheme (e.g., the complexity of option attributes) [39]. In comparison to other studies, researchers' definition of perceptual diversity may be more concrete and user-friendly. Therefore, perceptual diversity is defined as the perception of diversity in ingredients, practices, nutrition, etc. of the supplement food blind boxes perceived by consumers.

3.8. Convenience

Convenience is one of the most common reasons why consumers choose to make their purchases online [40]. The time and effort consumers invest in online shopping will affect their perception of convenience [41]. Due to the accelerated pace of the Internet, consumers are becoming less patient and spending less time choosing products and services than they did in the past.

Generally speaking, a variety of factors contribute to the convenience of a consumer in purchasing a product. Berry et al. deconstruct convenience as follows: Access convenience, Decision convenience, Transaction convenience, Benefit convenience and Postbenefit convenience [41]. In other words, it describes each aspect of the consumer's entire consumption experience. It has also been confirmed numerous times [42][43].

3.9. Purchase Intention

An individual's purchase intention is the tendency for that individual to take a particular action, and it is a strong predictor of that individual's behavior [44]. Positive emotions can in general influence consumers' positive

perceptions or attitudes about the product or store, resulting in increased purchase intentions [45]. In contrast, the higher the perceived risk, the lower the purchase intention [46]. In this regard, the intent to purchase is the most important step for a product. Additionally, purchase intention is crucial in the food industry. Eberle et al. investigated purchasing intentions concerning organic foods [47]. The study by Liu et al. investigated whether food photographs in online reviews influence consumers' purchase intentions [48].

4. Practical Implications

According to researchers' model (**Figure 1**), the following recommendations should be taken into consideration:

- Increasing the reputation of surplus food blind boxes (SN). For instance, promoting the amount of carbon dioxide that is reduced per serving and offering reduced prices can attract more customers with a variety of different attributes while making them possible repeat customers.

- Making blind boxes more interesting (PP), for example, by developing different styles of blind boxes (while preserving the mysterious characteristics of the blind box). The box may look similar, however, there are likely to be additional surprises within. It is also possible to add a QR code to the blind box, so the consumers can scan it and view the condition of the surplus food materials or the cooking process, which is not only entertaining, but also makes them feel more at ease. Maintain a consistent experience (CON) along the entire purchase path, focusing particularly on communication details and smoothness that stimulate consumers' feelings, such as improving menu logic, simplifying purchase steps, etc.

- Pay attention to the combination of ingredients (PVAR). Although there are relatively few combinations of surplus food, researchers can develop a number of combinations of surplus food that will best suit the tastes of consumers.
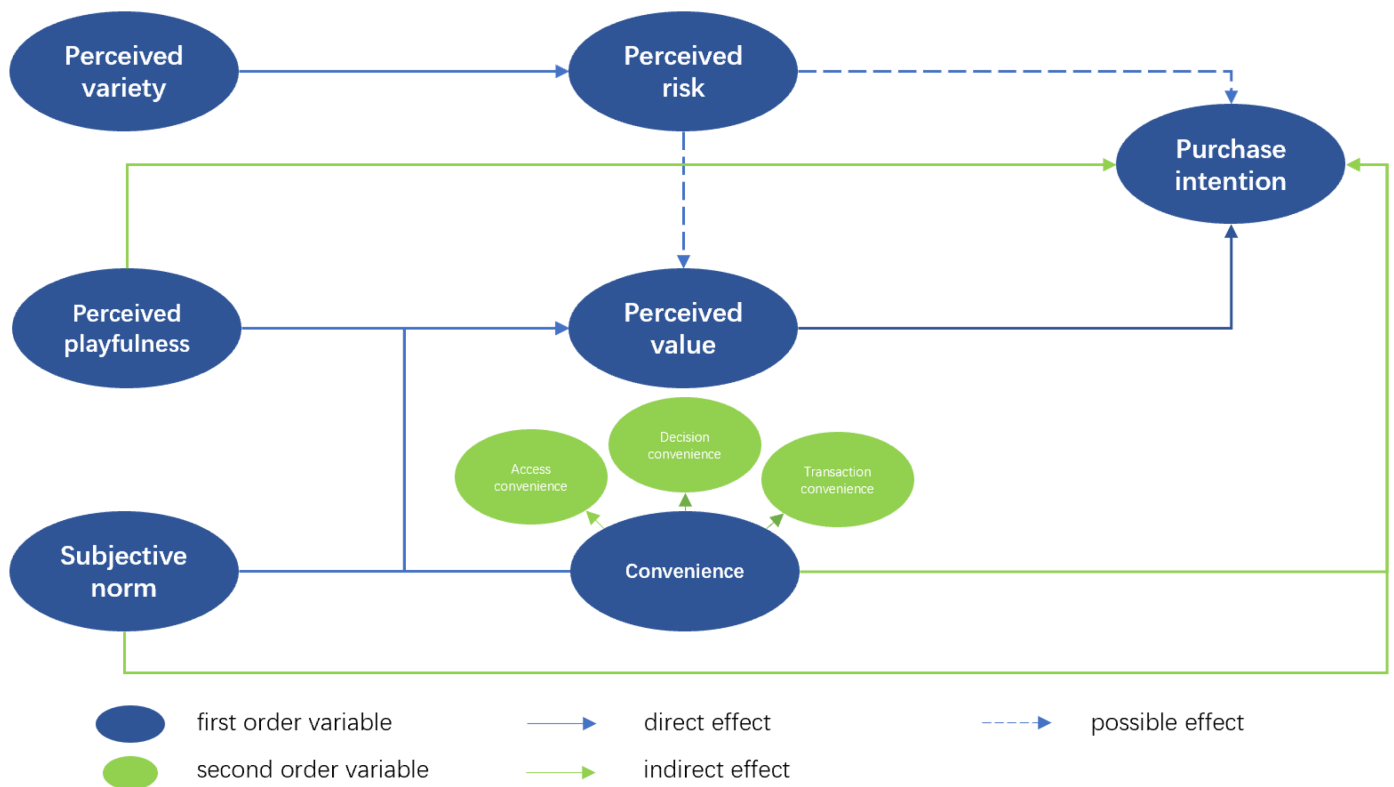
Figure 1. Perceived model of consumer surplus food blind boxes.

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