

# The Current Situation, Problems and Improvement Measures of Food Waste in China's Catering Industry

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**Abstract.** Food waste has become a very serious global problem that urgently requires the global attention and improvement. The promulgation of the Anti-Food Waste Law had a great impact on the China's catering industry, however, there are still many problems that need to be solved. Due to the advancement of information technology, online ordering services are gradually emerging, and the consumer online ordering behavior towards restaurants is increasing, leading to an increase in the degree of food waste in the catering industry. Due to many factors that affect food waste and some of them, such as personal consumer norms, it is difficult to change and limit the personal food waste behavior because it is controlled by subjective thoughts. This study proposes targeted suggestions based on not only the current situation but also the influencing factors in the Chinese catering industry, hoping to provide new ideas and ways to improve this situation.

**Keywords:** List the; keywords covered; in your paper.

## 1. Introduction

Food waste not only leads to the loss of food itself, but also means the waste of various resources invested throughout the entire life cycle of food production, processing, transportation, consumption, and subsequent processing, as well as unnecessary greenhouse gas emissions and other environmental impacts [1]. A significant quantity of greenhouse gases are produced by food waste, and China is one of the top emitters, with carbon dioxide emissions expected to reach 11.48 billion tons in 2022, or 31.19% of world emissions. It is expected that carbon dioxide emissions will reach 11.48 billion tons in 2022, accounting for 31.19% of world emissions. Food waste has emerged as a significant issue for many nations, with China seeing especially high levels of it. The annual loss of around 27% of the food consumed by people exacerbates the conflict between environmental pressures and production [2]. In April 2021, China promulgated the Anti Food Waste Law, which clearly stipulates administrative penalties for those who waste food. The focus of Chinese law differs from that of foreign countries, with a greater emphasis on the catering industry rather than the family [3]. This policy has been implemented for three years, limiting the occurrence of food waste. And it had a great impact, especially the high-end catering industry [4]. There are still a lot of issues, though. According to a research conducted in 2022, food waste in China's catering sector presently makes up about half of all food waste. There is still food waste in the catering business, despite a rise in internet ordering in recent years. While hard work, frugal living, and diligence are encouraged in traditional Chinese culture, people also strongly value kindness and generosity [5]. There is not yet a good balance between people's diligence, frugality, and hospitality.

This article aims to discuss the situation, problems, and improvements of food waste in the Chinese catering industry.

## 2. Global and Chinese food waste

### 2.1. Definition

Food waste is defined by the UN as food loss due to spoiling or waste. There are two categories under "food waste": "food loss" and "food waste." "Food loss" is the term used to describe the impact that food providers' actions in the supply chain to the amount or quality of food. It is the loss of food quantity and quality brought on by the decisions and actions of patrons and food service providers.

China's Anti Food Waste Law defines "food waste" as follows: "Food that has not been properly used according to its functional purpose and can be safely consumed or consumed, including waste, decreased quantity or quality of food due to unreasonable use, etc." This list is comprehensive. China, on the other hand, has opted for a broad expression rather than the categorization and description technique of kitchen waste in the food supply chain. Therefore, there is a limited definition in China due to the lack of a precise definition of waste behaviour in unique conditions. This implies that there will be a greater chance of ineffective law enforcement in real life [6].

## 2.2. Present Situation

How to reduce food waste is a global issue. According to statistics, in 2019, 931 million tons of food were wasted worldwide, accounting for around 17% of all the food that produced. Furthermore, the amount of food waste in both wealthy and developing nations is far higher than in prior research. But there is also a severe problem with world hunger. As per the 2022 World Food Security and Nutrition Report, 828 million individuals globally experienced hunger in 2021, accounting for about 29.3% of the global population experiencing food insecurity. Food waste is a major concern, yet hunger is still a real problem that has to be addressed by everyone [7].

The problem of food waste among consumers in most developing nations and regions, as well as in economies in transition, is underestimated when compared to wealthy ones. China wastes a staggering 120 million tons of grain annually, significantly more than the nation's yearly grain increase. Between 17-18 million tons of food waste are produced annually in urban catering sector alone, which is the same as throwing away the yearly rations of 200 million people, further explain its severity [8].

It is defined by the Food and Agriculture Organization (FAO) as the food that relevant actors persuade consumers to discard during the distribution, the retail, and the consumption stages. Food loss is defined as a decrease in the amount of edible food available for human consumption during production, post-harvest processing, storage, and processing. Approximately 27% of China's food production is indigestible by humans. However, the entire quantity of FLW roughly 25% of all FLW worldwide is startling [9]. China is a developing nation, yet compared to most other developing nations, it has a lower rate of food loss and waste. China's attempts to lower the global FLW are therefore essential.

## 3. Factors Affecting Food Waste in China's Catering Industry

### 3.1. Environmental Footprint

An ecological footprint is an area with biological production that might, under specific technical conditions, continuously create resources or consume waste. Due to food waste, studies have shown that fast food restaurants have relatively smaller environmental footprints than large restaurants [10]. Included are sizable eateries, including buffet places. Because there is more food left on plates and serving counters, there is more food waste [11].

### 3.2. Attitude and Awareness

Studies have shown that consumer attitudes, subjective norms, difference of price awareness, and other factors can also significantly influence the willingness to reduce the behavior of the food waste. Meanwhile, the effectiveness of reducing this behavior may be related to external factors such as the catering service methods and also the marketing strategies.

The differentiation of price awareness often affects the occurrence of over-consumption behavior [5]. Young consumers prefer to the over-consumption, the reason may be their higher frequency of using mobile phones and preference for online ordering. Many online merchants and the platforms often offer many high threshold coupons, thereby inducing over-consumption behavior among consumers. And the different levels of development in a region, as well as the high or low prices, may affect the formation of a person's price awareness.

### **3.2.1 Restaurant operator**

Employees involved in catering preparation work may affect the quality of the food. Related raining, dedication, and the attitude also determine the amount of food wasted [12].

### **3.2.2 Consumer**

Research has shown that personal norms have a significant link with reducing food waste for consumers. If consumers have a strong sense of responsibility, aware of the consequences and take the initiative to bear the bad consequences, then result in forming a personal norm [13].

## **3.3. Culture Difference**

### **3.3.1 The difference between the South and the North**

Chinese history has a long and profound history. The people have developed traditional cuisine and formed a rich culinary culture in history. Due to differences in geographical environment and individual dietary habits, there are many differences in diet and culture between the northern and southern regions of China. Most northerners are generous and provide a large amount of food in restaurants, which leads to a lot of waste. Southern restaurants like Guangdong offer a small amount of food, which is more exquisite and relatively less wasteful.

### **3.3.2 "Face saving" culture**

China has had a tradition of saving the food, but in terms of morality, it can have a negative effect on the waste. The areas where food waste occurs in catering mainly include wedding banquets, "event gatherings," business banquets, and friend gatherings. Although there are laws in China that deal with food waste, the current regulations are relatively principled, scattered, and lack systematic and manipulable [14]. Food waste in various types of "event gatherings" is very serious. With the continuous improvement of income and living standards of urban and rural residents, coupled with the influence of human relationships and society, it has become a major disaster area for food waste in catering.

## **3.4. National Policies**

Reducing food waste requires mutual support from countries, and it is important to refer to measures taken by other countries to address the food waste. Many countries have adopted legal, institutional, and policy measures to address the issue of food waste. Policies play an important role in reducing this waste. Compared to legal policies of other countries, China's laws on food waste are relatively single, concentrated on the consumer side. And compared to developed countries, there are few incentive measures in the policies [7].

## **4. Suggestion**

### **4.1. Management**

The urban catering industry in China is complex and diverse. There may be significant differences among different regions and catering formats. This has led to increased regulatory efforts in the catering industry, therefore, it is necessary to study the characteristics of different forms of catering food waste, establish regulatory models for different types of catering waste, and propose more targeted suggestions [15].

China should encourage the catering service industry to adopt innovative waste management measures. At present, most waste management methods are carried out at the operational level, and catering service institutions lack waste management indicators. Many waste management systems in the catering industry are outdated [4].

Due to the high level of food waste in large catering industries such as self-service restaurants, relevant research has identified a specific management measure to reduce its waste [11]. And the degree of food waste decreases with increasing food satisfaction, and food quality is the determining

factor of food satisfaction [15]. Suggest that catering companies fully participate and focus on innovating recipes to improve consumer satisfaction with food [12].

Compared to urban areas, the number of restaurants in rural China is relatively small, but the rural catering industry is crucial for promoting the rural economy [16]. Related studies have shown that landscape and the consumer preferences are inseparable, which may affect the consumer satisfaction. It is recommended to design rural restaurants to cater to consumer aesthetics as much as possible [17].

## **4.2. At the social level**

Food loss mainly occurs during the storage, circulation, and processing stages, and the improvement of technology and management efficiency can reduce this loss. Food waste mainly occurs in the retail and consumption stages, and due to the intervention of micro subject behavior, it is actually a loss that is difficult to control [18].

Related studies have shown that consumer food waste behavior when dining out can be improved through early intervention, outcome intervention, and food environment intervention [8]. In addition, conducting food waste education and publicity activities can enhance people's understanding and attention, and help further reduce food waste.

The increase in plate size will lead to an increase in consumer food consumption and waste. Suggest that the catering service department reduce the size of plates and reduce the number of restaurant trash cans.

## **4.3. National Policy**

### **4.3.1 Improve China itself**

At the national level, top-level design should be carried out and laws should be formulated to restrict restaurants that waste a lot of food [14]. Strengthen government supervision and require strict law enforcement. As mentioned earlier, China has fewer policy incentives. It is recommended to reward those who do not waste food, give money to encourage others not to waste food, or increase punishment measures, and deduct money from those who waste too much food. However, further exploration is needed to determine the standards for how much food is wasted.

### **4.3.2 Learn from policies of other countries**

A study compared the food waste laws of various countries and found that France and Spain both have legal policies based on the punishment; There are many incentive measures in Italian law. Grain donation may be an important measure to solve it. The only laws in China regarding donating food are the Anti Food Waste Law and the Chinese Civil Code [7]. Grain banks are also a measure to address the issue of food waste. However, as food banks have not yet been widely implemented in China, it is recommended to explore and develop strategies that are more in line with China's national conditions.

## **5. Conclusion**

Food waste is an urgent global issue, it not only reduces resource utilization, but also increases greenhouse gas emissions and has an impact on the environment. Improving policies, food donations, waste disposal, and educating the people can reduce this food waste.

This study searched for relevant literature on food waste both domestically and internationally and found that there is relatively little research on food waste in China, especially after the promulgation of the Anti Food Law in 2021. Due to the lack of relevant literature specifically studying the factors of food waste in the Chinese catering industry, and the lack of a unified perspective and the fixed aspects in various articles. So, this article may have overlooked some factors related to food waste. In addition, there are relatively few suggestions provided in this article to improve consumer food waste psychology, as consumer psychology is relatively subjective and less susceptible to external influences. The reason for this phenomenon may be that this law has dealt a heavy blow to the Chinese

catering industry, as the food waste behavior in the industry has been improved compared to before. However, due to the rise of food delivery services in recent years, there has been a resurgence of food waste in the Chinese catering industry. Most developed countries have made reducing food waste a clear national strategic goal, and improving measures to address China's food waste is essential for China to achieve its transformation into a developed country. If this field can be effectively managed, it will have a positive impact on the phenomenon in China and even in the world. As a developing country, China can strengthen research on food waste, improve legislation, formulate more incentive measures, explore more suitable policies for China to reduce food waste, and intervene in food waste in the catering industry from multiple aspects in the future. And improve the personal norms of consumers and improve the current situation by promoting and educating the people about the consequences of food waste.

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