

The Effectiveness of China's Anti-Food Waste Campaign on University Canteens

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doi:10.56397/SSSH.2024.11.08

Abstract

Food waste in university canteens is a significant issue in China, contributing to environmental degradation and financial inefficiencies. In response, the Chinese government and universities have implemented comprehensive anti-food waste campaigns aimed at reducing waste volumes and promoting sustainable consumption practices. This paper examines the effectiveness of these measures, focusing on their impact on student behavior, operational efficiencies, and broader environmental benefits. Key initiatives include the introduction of portion control options, educational programs, and advanced waste monitoring technologies. Through case studies and comparative data analysis, the study highlights significant reductions in food waste, cost savings, and improved environmental outcomes. The findings underscore the importance of combining technological innovation with behavioral change to achieve long-term sustainability in campus dining.

Keywords: food waste reduction, university canteens, sustainability, anti-food waste campaign, student behavior

1. Background

Food waste has become a significant issue in China, reflecting both environmental and economic challenges. According to studies, China discards millions of tons of food annually, with a substantial portion originating from the food service sector, including university canteens. These canteens serve large student populations daily, making them critical hotspots for food waste. Students often discard uneaten food due to factors such as excessive portions, unappealing meal options, and a lack of awareness about the environmental impact of their behavior. The scale of waste not only strains institutional budgets but also contributes to broader issues like resource depletion and greenhouse gas emissions.

Recognizing the severity of food waste, the Chinese government has introduced a series of initiatives aimed at promoting sustainable consumption. Central among these efforts is the "Clean Your Plate" campaign, launched in 2013 and revitalized in 2020. This campaign encourages individuals to reduce food waste by taking only what they can consume and emphasizes personal responsibility. Through widespread media coverage and endorsements from public figures, the campaign has gained considerable traction. It is further supported by policy measures, such as stricter regulations on food production and distribution, alongside incentives for organizations that implement waste reduction strategies.

University canteens have been identified as strategic points for enforcing these anti-food waste initiatives. They offer controlled environments where targeted measures can be tested and implemented effectively. By incorporating flexible portion sizes, promoting awareness through educational programs, and employing technological tools to monitor and reduce waste, university canteens play a pivotal role in addressing the food waste problem. Their efforts not only directly reduce waste but also serve as a model for fostering long-term behavioral change among young people, who are key drivers of societal shifts. Through these measures, universities contribute significantly to the national goal of building a more sustainable and responsible food

consumption culture.

2. Food Waste Behaviors in University Settings

Food waste in university settings is influenced by a combination of individual habits, institutional practices, and social dynamics. Among students, food waste often arises from a mismatch between the quantity of food served and actual consumption. Many canteens operate with fixed portion sizes, which frequently exceed what students can reasonably eat. This leads to a significant amount of uneaten food being discarded, especially when students are dissatisfied with meal options. Common complaints include unappealing taste, lack of variety, or unfamiliarity with certain dishes. Vegetables and side dishes are particularly prone to being left uneaten, as students often prioritize main courses or protein-rich items.

Lifestyle factors also play a crucial role. University students often have irregular schedules due to academic and social commitments, which can result in skipping meals or opting for quick snacks. When they do visit the canteen, they may overestimate their hunger, leading to over-served portions and increased waste. Additionally, dietary preferences, such as the growing trend toward vegetarianism or other specific diets, can contribute to waste when suitable options are limited or when students are served items they prefer to avoid. Food allergies and intolerances further complicate this issue, as students may need to leave portions of their meals uneaten to avoid adverse reactions.

Social norms within the dining environment significantly influence food waste behavior. In communal settings, students may feel pressured to conform to behaviors observed among their peers. For instance, some students may feel the need to take large portions to avoid appearing overly frugal or to fit in with group norms. Conversely, in some cases, leaving food unfinished might be perceived as normal or even as a sign of affluence. Peer influence can also discourage individuals from finishing their meals if others have already discarded theirs. However, positive social influences can counteract this trend, as students are more likely to adopt waste-reducing behaviors when they see peers actively participating in sustainability efforts.

Psychological factors further contribute to waste. Many students in university canteens do not directly associate their meal consumption with its cost, as food is often subsidized. This detachment from the financial value of food can lead to a casual attitude toward waste. Additionally, the abundance of food options available in canteens may create a perception of surplus, reducing the perceived urgency to conserve resources. Cultural attitudes also play a role; while traditional Chinese values emphasize the importance of conserving food, modern dining habits among young people sometimes reflect a more casual approach to waste, shaped by convenience and personal preference.

Overall, these behaviors highlight the complex factors driving food waste in university settings. Understanding these patterns is critical for designing targeted interventions that address the root causes of waste, ultimately fostering a culture of sustainability and responsibility within university communities.

3. Implementation of Anti-Food Waste Measures in University Canteens

3.1 Portion Control and Flexible Serving Sizes

A foundational strategy in reducing food waste in university canteens involves the implementation of portion control and flexible serving sizes. Historically, fixed portion sizes have been a standard practice, but they often fail to meet the varied appetites and dietary needs of a diverse student population. Over-serving is a common issue, as students are frequently provided with more food than they can consume, leading to significant amounts of waste. To address this, many universities have introduced options for smaller portion sizes, allowing students to customize their meals according to their actual hunger levels. This adjustment has proven to be an effective way to reduce waste without compromising meal satisfaction.

Some institutions have gone further by introducing self-service stations, where students can serve themselves from a variety of meal components. These stations provide an opportunity for students to take only what they need, promoting a sense of personal responsibility and mindfulness. Additionally, canteen staff play an important role by offering guidance on appropriate portion sizes, particularly during peak dining hours when students may be less deliberate in their choices. The flexibility offered by these measures not only reduces waste but also improves the overall dining experience, as students feel more in control of their meals and are more likely to consume everything on their plates.

3.2 Awareness Campaigns and Educational Programs

Behavioral change is essential for the success of any anti-food waste initiative, and awareness campaigns serve as a powerful tool in shaping student attitudes and actions. Universities have rolled out comprehensive campaigns that utilize both traditional and digital mediums to reach the student body. In canteens, posters and digital screens display eye-catching messages about the impact of food waste, including its environmental and economic costs. These visual prompts serve as constant reminders of the importance of mindful consumption.

Social media campaigns complement these efforts, leveraging platforms like WeChat, Douyin, and Weibo to engage students in interactive challenges and discussions about sustainability.

Educational programs provide a more in-depth approach by integrating sustainability topics into the academic and social fabric of university life. For instance, orientation sessions for new students often include segments on campus sustainability initiatives, highlighting the role of individuals in reducing food waste. Workshops and seminars, often organized by student environmental clubs, delve deeper into the subject, providing practical advice on how to reduce waste and explaining the broader implications of unsustainable consumption. Universities also organize events such as “Clean Plate Days,” where students are encouraged to finish their meals, and those who do are recognized or rewarded. These initiatives help to normalize waste reduction behaviors and foster a collective sense of responsibility.

3.3 Technology for Tracking and Displaying Waste Data

The integration of technology has revolutionized the way universities manage and communicate food waste. Digital signage systems placed in canteens provide real-time feedback to students by displaying the amount of food wasted daily, weekly, or monthly. This visual data not only raises awareness but also serves as a motivational tool, as students can see the immediate impact of their collective efforts to reduce waste. Some systems go a step further by translating waste data into relatable terms, such as the equivalent number of meals wasted or the environmental cost in terms of water and carbon footprint.

Advanced waste monitoring systems have also been implemented in several universities. These systems use sensors and analytics to track food waste patterns, providing detailed insights into which dishes are most frequently wasted and at what times of the day waste levels peak. This information enables canteen managers to make data-driven decisions about menu planning, portion sizes, and inventory management, optimizing operations to align with actual consumption trends. Additionally, some universities have developed mobile applications that allow students to track their personal waste reduction progress. These apps provide personalized feedback and suggestions for improvement, fostering a more engaged and proactive student body.

Beyond tracking, technology is used to gamify the process of waste reduction. For example, some canteens have introduced leaderboards that display the most waste-conscious dining halls or even individual students, encouraging healthy competition. By making waste reduction a shared and measurable goal, these technological innovations not only enhance operational efficiency but also drive long-term cultural change, embedding sustainability into the daily lives of students. Through the combined use of portion control, awareness campaigns, and advanced technology, universities are making significant strides in reducing food waste and promoting a culture of sustainability on campus.

4. Behavioral Changes and Their Impact: Shifts in Attitudes, Participation, and Notable Case Studies

The implementation of anti-food waste measures in university canteens has significantly influenced student behavior, fostering a more conscientious dining culture. Before these initiatives, food waste was largely perceived as an insignificant issue. Many students were unaware of the far-reaching environmental and economic consequences of their dining habits, viewing uneaten food as a minor byproduct of their daily routines. However, the introduction of structured anti-waste campaigns and educational programs has catalyzed a paradigm shift in how students approach food consumption. Awareness campaigns have underscored the environmental costs of food waste, such as resource depletion and greenhouse gas emissions, while educational efforts have emphasized the ethical dimensions of food security and sustainability.

Surveys conducted at multiple universities reveal a marked increase in students’ mindfulness when dining. A significant proportion of students now actively consider portion sizes, opting for smaller servings to ensure they consume their entire meal. Many report feeling a sense of responsibility not just for their own choices but also for contributing to a collective effort to reduce waste. This shift is particularly evident in their adoption of sustainable dining practices, including finishing meals and encouraging peers to do the same.

Beyond attitude changes, the tangible effects of practical measures like self-service options and waste separation systems are equally noteworthy. Self-service stations have empowered students to tailor their portions according to their actual hunger, thus reducing over-serving. These stations are widely appreciated for the autonomy they provide, making students feel more in control of their dining choices. Likewise, waste separation systems have seen increased engagement, with students diligently sorting leftovers into designated bins for composting or recycling. Universities have further incentivized these behaviors through rewards such as meal discounts or public recognition for those who consistently demonstrate waste-conscious dining habits. This growing participation not only reflects individual behavioral changes but also points to a broader cultural shift within campus dining environments, where reducing waste has become a shared responsibility.

The effectiveness of these initiatives is vividly illustrated through case studies of specific universities. At Xiamen University, the adoption of a digital tracking system, combined with the introduction of self-service

options, resulted in a significant 30% reduction in food waste within the first year. The digital system provided real-time feedback on the volume of food waste generated, displaying this information prominently in dining halls. This transparent approach proved to be a powerful motivator, as students could see the immediate impact of their choices. Many students at Xiamen reported that the visual data encouraged them to take smaller portions and finish their meals, fostering a greater sense of accountability.

Similarly, Nanjing University has been a pioneer in implementing a comprehensive waste separation program. This initiative was complemented by regular awareness campaigns that highlighted the importance of food waste reduction. The program not only improved waste management practices but also created a sense of community among students. Peer-led initiatives, such as organizing workshops on sustainable dining and setting up volunteer groups to monitor waste separation, further reinforced the university's commitment to sustainability. Students actively participated in these efforts, demonstrating a collective drive to make their campus more sustainable. As a result, Nanjing University has seen a consistent decline in food waste, along with heightened student engagement in environmental initiatives.

These examples underscore the critical role of student participation in the success of anti-food waste measures. The visible outcomes of these case studies highlight the importance of integrating technological tools, educational programs, and community-building activities. Together, they create a holistic framework for reducing food waste and instilling sustainable practices among the student population. By fostering a sense of personal and collective responsibility, universities not only address immediate waste concerns but also contribute to the long-term goal of cultivating environmentally conscious citizens.

5. Challenges in Reducing Food Waste in University Canteens

Despite the notable progress made through anti-food waste initiatives, university canteens continue to face significant challenges in achieving sustainable results. One of the most persistent obstacles lies in the deeply ingrained cultural attitudes toward food abundance. In Chinese society, where food abundance has historically been associated with prosperity and hospitality, there is often a subconscious preference for over-serving and an acceptance of food waste. This cultural backdrop makes it difficult to instill a sense of urgency around waste reduction, particularly among students who may not fully grasp the broader environmental and social impacts of their consumption habits. Changing these deeply rooted behaviors requires not only awareness campaigns but also a shift in cultural norms, which is a slow and complex process.

Operational hurdles further complicate the implementation of anti-food waste measures. University canteens are large-scale operations that must cater to thousands of students daily, often with limited flexibility in their processes. Ensuring that kitchen and serving staff consistently comply with new portion control measures can be challenging, especially if these changes are perceived as adding complexity or reducing efficiency. Additionally, smaller portion sizes, while effective in reducing waste, can sometimes lead to dissatisfaction among students who feel they are receiving less value for their money. Maintaining a balance between portion control and meal satisfaction is crucial, as negative feedback can undermine the success of waste reduction initiatives. Furthermore, the variability in student turnout during different meal periods complicates meal preparation, often leading to surplus food that cannot be efficiently redistributed or reused.

Monitoring and enforcing anti-food waste practices also present significant difficulties. While many universities have adopted technological solutions such as digital waste tracking systems, these tools are only as effective as their implementation. Inconsistent usage by both staff and students can result in incomplete or inaccurate data, undermining the ability to assess the true impact of waste reduction measures. Additionally, the transient nature of the student population, with new cohorts arriving each year, makes it difficult to maintain a consistent level of compliance and awareness. Enforcement is further complicated by the lack of immediate consequences for non-compliance, which can lead to a sense of complacency among students and staff alike.

Financial constraints are another limiting factor, particularly for smaller universities that may struggle to invest in advanced waste monitoring technologies or to sustain long-term awareness campaigns. The cost of implementing and maintaining these systems can be prohibitive, leaving some institutions reliant on less effective manual methods. Without sufficient resources, these universities face an uphill battle in tracking waste accurately and making data-driven decisions to improve their operations.

These challenges highlight the complexities involved in reducing food waste within the context of university canteens. Addressing them requires a holistic approach that combines technological innovation, operational efficiency, and sustained efforts to shift cultural attitudes. Universities must work to create a supportive environment where waste reduction is not only feasible but also embraced as a shared responsibility by the entire campus community.

6. Impact Assessment of the Campaign

Evaluating the effectiveness of anti-food waste campaigns in university canteens requires a comprehensive

assessment of various metrics. One of the primary indicators of success is the reduction in the volume of food waste. Many universities have implemented waste monitoring systems that track the amount of discarded food daily, providing quantitative data to measure the impact of their initiatives. Significant decreases in waste volumes post-campaign are often seen as clear evidence of progress. For instance, canteens that introduced self-service options and portion control have reported waste reductions of 20-30% within the first year, highlighting the effectiveness of these strategies.

Cost savings represent another critical metric. By reducing food waste, canteens can lower their expenditure on raw materials and operational costs associated with waste management, such as disposal and composting. Some universities have reported annual savings in the tens of thousands of yuan, which can be redirected to improve other aspects of campus dining, such as enhancing meal quality or introducing more sustainable food options. These financial benefits not only support the sustainability goals of the university but also demonstrate the economic viability of implementing waste reduction measures.

A thorough comparison of pre- and post-campaign data provides deeper insights into the campaign's impact. Before implementing anti-food waste initiatives, baseline data on waste volumes, meal consumption patterns, and student satisfaction levels are collected. This data is then compared to similar metrics gathered after the campaign's introduction. Such comparisons often reveal not only reductions in waste but also improvements in student engagement with sustainability practices. For example, an increase in the adoption of self-service options and greater participation in waste separation programs are commonly observed post-campaign.

Beyond the immediate operational and financial impacts, reducing food waste in university canteens contributes to broader environmental and economic benefits. On an environmental level, less food waste translates into lower greenhouse gas emissions, as the decomposition of organic waste in landfills is a significant source of methane. Additionally, the conservation of resources used in food production, such as water, energy, and labor, aligns with global sustainability efforts. Economically, the reduction in demand for food production driven by decreased waste can contribute to stabilizing food prices and reducing pressure on agricultural systems.

Overall, the impact assessment underscores the multifaceted benefits of anti-food waste campaigns. These initiatives not only enhance the efficiency and sustainability of campus dining operations but also contribute positively to broader environmental and economic goals. By leveraging data-driven insights and continuous improvement, universities can further refine their strategies, ensuring lasting benefits for both their institutions and the wider community.

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