



# FOOD CONSUMPTION AND DIETARY STATUS OF RESIDENTS IN HANGZHOU



Good Food  
China Food Systems Action Hub

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# EXECUTIVE SUMMARY

The global food system is facing significant challenges, and transformation is imperative. Urban food consumption is both a major contributor to these challenges and a potential avenue for change, offering solutions for food systems transformation.

In China, as incomes rise, dietary imbalances have become increasingly pronounced, with rising rates of overweight and obesity, as well as an increasing prevalence and risk of chronic diseases. The trend of Westernization in Chinese residents' dietary composition is evident, diverging significantly from the recommendations of the *Chinese Dietary Guidelines (2022)*. Based on past analyses, the *Scientific Research Report for Chinese Dietary Guidelines* has stated that, the Jiangnan region, represented by Zhejiang, Shanghai, and Jiangsu, exhibits dietary patterns closer to the ideal and can serve as a model for the *Eastern Healthy Diet*.

According to the sample survey results released by the Hangzhou Municipal Health Commission on the nutritional and health status of residents' diets, four key characteristics have emerged: 1) insufficient dietary diversity, 2) high meat consumption (carnivory), 3) preference for highly- seasoned flavor profile, and 4) an over-reliance on refined foods, lacking sufficient whole grains and fruits. Meanwhile, initiatives such as low-carbon city development, healthy city construction, and future community planning are progressing rapidly in Hangzhou. Food consumption is inextricably linked to these efforts, making it essential to adopt a food systems approach at the urban level to systematically advance the transformation toward sustainable and healthy diets.

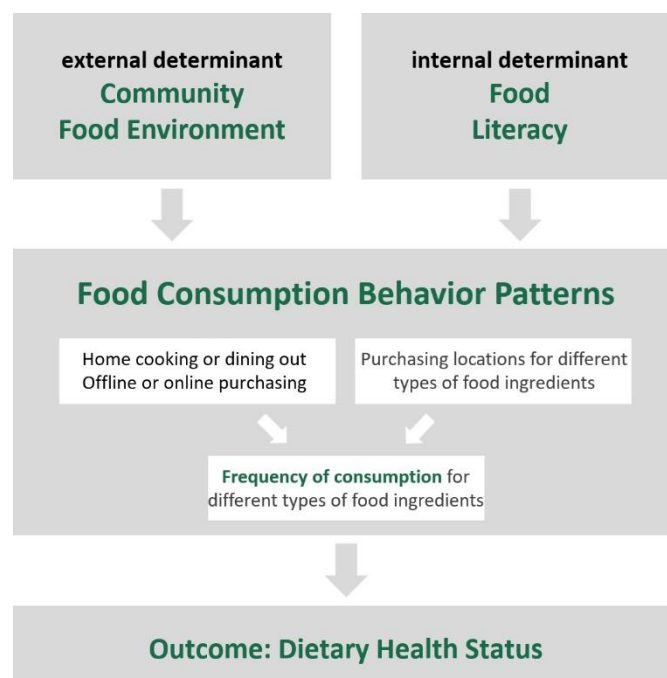


Figure. Research framework

This study focuses on the central urban areas of Hangzhou with the goal of obtaining a detailed and in-depth understanding of residents' food consumption and dietary health status, as well as the influencing factors and mechanisms. The research findings will provide a basis for stakeholders to explore further actions. The study framework, as illustrated above, centers on food literacy and food environment as the key internal and external determinants of food consumption behaviors, exploring how these factors shape dietary habits and health outcomes.

The research included desk research, stakeholder and expert consultations, field surveys, and statistical data analysis. The field survey covered six communities and one wet market, utilizing questionnaires, field observations, and interviews as empirical research methods. To collect quantitative data on the dietary structure, food consumption patterns, food literacy, and food demand of Hangzhou residents, an electronic questionnaire incorporating the Food Frequency Questionnaire (FFQ) was designed and distributed both through offline community engagement and online social groups, yielding 338 valid samples.

## **Chapter 1: Introduction**

This chapter provides an overview of the research background, significance, scope, objectives, key concepts, framework, methodology, and field survey design.

## **Chapter 2: Dietary Status of Hangzhou Residents**

Based on data from the Food Frequency Questionnaire (FFQ), the dietary structure of the surveyed population was classified, and their dietary health status (assessed using a scoring system ranging from 0 to 10) was evaluated. The analysis also examined correlations between demographic and socioeconomic factors, personal health attributes, and dietary health status.

The FFQ data indicate that the most prominent dietary imbalances include high meat consumption and insufficient intake of plant-based foods such as soybeans and its products, whole grains, legumes, and nuts.

- Nearly 60% of residents consume meat or fish daily, but half of them rarely eat soy-based products. From the perspective of sustainable and healthy diets, this dietary structure is concerning. The proportion of residents who moderately consume meat or fish while regularly eating soy products is less than 10%.
- The average dietary health score across all samples was 5.2 out of 10, with 17% of residents scoring only 1-3 points, and only 9% scoring 8-10 points.
- Compared to those with the highest dietary health scores, individuals with the lowest scores were more likely to be younger men with higher income levels, longer education years, and shorter residency in Hangzhou. They were also less likely to live with family or partners.
- FFQ-based dietary health scores correlated strongly with residents' self-assessments, indicating that individuals have a relatively accurate perception of their dietary health.
- The frequency of engaging in recreational physical activity was positively associated with dietary health scores.

- Chronic disease prevalence increased with age, and the impact of dietary health on chronic disease incidence also became more significant with aging.

### Chapter 3: Food Consumption Behaviors and Dietary Health

This chapter examines the food consumption behavior of the surveyed population and analyzes its correlation with dietary health status.

- Home-cooked meals remain the primary dietary pattern, especially for families, while more than half of working-age residents eat lunch outside on weekdays.
- Young, well-educated individuals who have lived in Hangzhou for 6 months to 10 years ("new Hangzhou residents") are more inclined to dine out and overlap with those who prefer online grocery shopping.
- *Hypermarkets* and *wet markets* serve as the primary food purchasing sources for residents, with many people frequenting different locations to buy different types of food. Analysis suggests that preferences for *wet markets*, *hypermarkets*, or *small stores (including fruit stores and convenience stores)* may be influenced by personal factors such as age, income, and education level. While offline food shopping remains the dominant consumption method, the rise of online channels has begun to disrupt traditional food purchasing habits. Among the respondents in this study, nearly 40% regularly buy food online.
- Correlation analysis between food consumption behavior and dietary health status indicates that individuals who prefer online food purchases, frequently eat out, or order takeout tend to have poorer dietary health. These associations are statistically significant. Conversely, those who prefer shopping at wet markets, mobile vendors, and small-to-medium-sized supermarkets exhibit better dietary health than those who do not favor these locations for food purchases.
- Analyzing food consumption locations based on the appropriateness of intake for each food category suggests that wet markets and fresh food supermarkets may positively influence the reasonable intake of certain foods, whereas hypermarkets, convenience stores, and online channels may have a negative impact on the appropriate intake of certain food types.

### Chapter 4: Residents' Food Literacy and Dietary Health

This chapter investigates the surveyed population from multiple dimensions of food literacy (knowledge, willingness, skills, and behavior) and analyzes its correlation with dietary health status.

- **Commonalities:** The overall knowledge level of Hangzhou residents regarding sustainable and healthy diets needs improvement, particularly in understanding the environmental and social sustainability aspects of dietary choices. Residents show a high willingness to improve their dietary health, with a focus on adopting lighter flavors and diversifying food types. Most residents possess basic cooking skills. While there is significant attention to personal safety, health, and nutrition when selecting food, sustainable practices such as avoiding single-use utensils and bringing reusable shopping bags are less common.
- **Differences:** Men perform better in knowledge but lag behind women in behavior and skills. However, men exhibit a higher willingness to improve their daily diets compared to women.



Younger individuals show the weakest performance in behavior, knowledge, and skills, while middle-aged individuals perform the best. Nevertheless, young people have the highest willingness to improve their daily diets, whereas older adults show the lowest willingness.

- **Correlation:** Food literacy is positively correlated with residents' dietary health status overall, with the strongest positive correlation observed at the behavioral level. This indicates that individuals who pay more attention to health when purchasing and cooking food are more likely to have better dietary health status.

## Chapter 5: Community Food Environment and Its Impact on Residents' Food Consumption

This chapter focuses on the role of the food environment. It first evaluates the food retail environment within the study area using an online dataset, with a health-oriented approach and streets as the unit of analysis. Subsequently, it explores the relationship between the community food environment and residents' food consumption.

### Findings at the Street Level:

- **Dominance of Unhealthy Food Retail Facilities:**  
Streets are predominantly dominated by food retail facilities that have a negative impact on health (unhealthy food retail facilities), and their numbers show a linear relationship with those that have a positive impact on health (healthy food retail facilities). Among the seven types of food retail facilities with health impacts, fast-food restaurants account for the largest proportion. From 2019 to 2024, except for community canteens, the number of all other food retail facilities has shown a declining trend.
- **Density and Distribution:**  
Streets with high densities of unhealthy food retail facilities overlap with those having high densities of healthy food retail facilities, both concentrated in the urban core area east of West Lake. In terms of per capita availability, streets with high per capita availability of healthy food retail facilities show a V-shaped distribution, while those with the highest per capita availability of unhealthy food retail facilities are scattered. Over the five-year period, streets with an increase in the total number of healthy food retail facilities are dispersed, whereas those with an increase in unhealthy food retail facilities are located on the edges of the central urban area.
- **Street Comparisons:**  
Comparative rankings reveal that Hubin Street in Shangcheng District, Xiangfu Street in Gongshu District, and Baiyang Street in Qiantang District exhibit significantly unhealthy characteristics in their food retail environments.

### Findings at the Community Level:

- **Older Residential Neighborhoods vs. Privately Developed Residential Communities:**  
The quality of the food environment in older neighborhoods is generally better than that in newly developed communities, but residents rate its affordability lower. In contrast, residents of privately developed residential communities rate affordability higher, but the total number of surrounding food retail facilities is, on average, 189.2 fewer than in older neighborhoods, with a higher proportion of unhealthy food retail facilities and a 7.1% higher share of fast-food restaurants.

- **Urban vs. Suburban Differences:**

Significant differences exist between suburban and urban food environments. Urban residents' average overall rating of the food environment (20.61) is significantly higher than that of suburban residents (19.14) ( $P < 0.01$ ).

- **Trust in Government Intervention:**

Different types of communities exhibit varying levels of trust in government intervention. Residents of resettlement communities have lower trust in the role of the community.

- **Impact on Food Consumption:**

The community food environment significantly influences residents' food consumption frequency, location, and methods, particularly for healthy food categories such as vegetables, fruits, and aquatic products.

### **Key Insights from the Research:**

1. **Westernization of Diets in Hangzhou:**

The Westernization of residents' diets in Hangzhou has become a serious issue, necessitating large-scale interventions to increase the consumption of whole grains, soy products, and nuts while reducing excessive meat consumption. Targeted interventions for specific groups, such as young people with shorter residency durations, living alone, or with roommates (non-partner/family), especially males, are also crucial.

2. **Role of Traditional Food Retail Networks:**

The network system centered on wet markets, supplemented by fresh supermarkets and convenient vegetable stores, not only serves as the foundation of residents' food security but also contributes positively to their dietary health. However, traditional offline food retail facilities are increasingly challenged by online channels. Policies should support wet market-centered food retail facilities, prioritizing residents' health, food access equity, and local economic prosperity. The health risks associated with the growing popularity of online food delivery and fresh food purchases must also be adequately addressed through effective regulation and guidance.

3. **Food Literacy and Behavioral Change:**

Residents need a more systematic and comprehensive understanding of sustainable and healthy diets, translating into their daily lives and behaviors. Young people, while having the weakest knowledge, skills, and behaviors related to sustainable and healthy diets, exhibit the strongest willingness to improve their dietary health. This makes them a high-potential group for targeted interventions. Given the stronger positive correlation between behavioral aspects of food literacy and dietary health status (compared to knowledge and skills), interventions should focus on behavior, utilizing theories and models of behavioral change.

4. **Impact of Food Environment on Consumption:**

Food consumption behaviors, which directly determine dietary health status, are significantly influenced by the food environment. While online food consumption methods such as food delivery and fresh food purchases are increasingly popular, their associated health risks must be addressed through effective regulation and guidance. At the same time, the traditional offline food retail network, centered on wet markets and supplemented by fresh supermarkets and convenient

vegetable stores, remains a cornerstone of residents' food security and contributes positively to dietary health. Policies should support these facilities, emphasizing health, equity, and local economic vitality.

#### **5. Community-Specific Interventions:**

Different types of communities face unique challenges and needs regarding their food environments. Suburban food environments require more attention and investment. In privately developed residential communities, there is a need to increase healthy food retail facilities and reduce the proportion of unhealthy options. In older neighborhoods, measures should be taken to regulate food prices and ensure affordability. Policymakers should tailor improvement strategies to the characteristics of each community type to ensure all residents have access to equitable and high-quality food environments.

### **Chapter 6: Summary and Outlook**

**Finally, this report proposes several actionable recommendations from the following five aspects for the reference of stakeholders such as policymakers and industry decision-makers.**

#### **1. Develop, implement, and promote a comprehensive urban food strategy**

- Use sustainable and healthy diets as a focal point to mobilize all relevant municipal departments and stakeholders to develop a comprehensive urban food strategy based on robust scientific evidence.
- Establish mechanisms such as committees, databases, and case libraries to gradually implement the urban food strategy.
- Continuously garner attention and support for the urban food strategy through various promotional strategies.

#### **2. Promote Hangzhou-style sustainable and healthy diets through local dietary guidelines**

- Define sustainable and healthy diets for Hangzhou.
- Develop and promote sustainable and healthy dietary guidelines tailored to Hangzhou.

#### **3. Enhance public food literacy**

- Promote food education.
- Improve community food literacy.
- Lead initiatives for sustainable and healthy diets.

#### **4. Optimize the urban food environment**

- Improve the food retail environment to ensure access to sustainable and healthy foods.
- Implement measures to curb unhealthy food consumption.
- Promote sustainable and healthy diets in institutional food services.

#### **5. Transform urban and rural food production**

- Support the transformation of local agriculture to meet the demand for sustainable and healthy diets.
- Promote urban agriculture and community gardens.
- Support the research, development, and production of sustainable and healthy foods.